U.S. Department of the Interior
Bureau of Land Management

Jove Solar Energy Project

Draft Environmental Impact Statement

April 2024

Prepared by:

U.S. Department of the Interior
Bureau of Land Management

In Cooperation with:

Arizona Department of Transportation
Arizona Game and Fish Department
Fort Yuma-Quechan Tribe
La Paz County
U.S. Army Corps of Engineers
U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service

Jove Solar Project

Draft Environmental Impact Statement

Bureau of Land Management
Yuma Field Office
Yuma, Arizona

April 2024

Mission

The Bureau of Land Management's mission is to sustain the health, diversity, and productivity of public lands for the use and enjoyment of present and future generations.

U.S. Department of the Interior
Bureau of Land Management
Yuma Field Office
7341 E 30th Street, Suite A
Yuma, AZ 85365-6525

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JOVE SOLAR PROJECT
DRAFT ENVIRONMENTAL IMPACT STATEMENT

Abstract

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Cooperating Agencies	U.S. Army Corps of Engineers U.S. Environmental Protection Agency U.S. Fish and Wildlife Service Arizona Game and Fish Department Arizona Department of Transportation La Paz County, Arizona Fort Yuma-Quechan Tribe
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Jove Solar, LLC is seeking a 30-year right-of-way to use 3,495 acres administered by the Bureau of Land Management (BLM) and 38 acres administered by La Paz County in southwestern Arizona to construct, operate and maintain, and decommission a utility-scale solar photovoltaic (PV) facility, the Jove Solar Project (the Project). The Project would consist of up to 1.2 million solar PV modules and associated infrastructure, including new and improved roads, powerlines for collection and transmission of electricity, operation and maintenance facilities, and possibly a battery energy storage system. The Project would have a generation capacity of 600 megawatts or more.

The BLM prepared this Draft Environmental Impact Statement (Draft EIS) with input from Cooperating Agencies to address the direct, indirect, and cumulative impacts of the Project. The Draft EIS analyzes these three alternatives:

- No Action Alternative, in which the BLM would not authorize construction, operation and maintenance, and decommissioning of the Project
- Proposed Action
- Wash Avoidance Alternative, which avoids construction in a desert wash and near known sensitive areas using specified setbacks.

Public comments will be accepted for 45 calendar days following the U.S. Environmental Protection Agency's publication of the notice of availability for this Draft EIS in the Federal Register. All comments must be received no later than no later than 11:59 p.m. MDT on June 3, 2024. Comments may be provided in the following ways:

- ePlanning website: https://eplanning.blm.gov/eplanning-ui/project/2017881/510
- Via email to: BLM_AZ_CRD_SOLAR@BLM.gov
- Via hand delivery or postal mail to:
  BLM Yuma Field Office, Attn.: Jove Solar EIS
  7341 E 30th Street, Suite A, Yuma, AZ 85365-6525
- Via fax to: (928) 317-3250

United States Department of the Interior
BUREAU OF LAND MANAGEMENT
Yuma Field Office
7341 East 30th Street, Suite A
Yuma, Arizona 85365-6525
www.blm.gov/arizona

Dear Reader:

Enclosed for your review and comment is the Draft Environmental Impact Statement (Draft EIS) for the Jove Solar Project (Project). The Draft EIS was prepared by the U.S. Department of the Interior, Bureau of Land Management (BLM), pursuant to the Federal Land Policy and Management Act of 1976 and the National Environmental Policy Act of 1969. Jove Solar, LLC (the Applicant), applied to the BLM in April 2022 for a right-of-way (ROW) on public land. The Applicant submitted an original ROW application to BLM on October 24, 2019, as Taurus Solar. A prior name for the Project is also Orion Solar. The Project would consist of up to 1.2 million solar photovoltaic modules and associated infrastructure, including new and improved roads, powerlines for collection and transmission of electricity, operation and maintenance facilities, and possibly a battery energy storage system. The Project would interconnect at the Cielo Azul Substation, adjacent to the Ten West Link 500-kilovolt transmission line.

In preparing the Draft EIS, the BLM developed a range of alternatives to address resource conflicts by considering: 1) issues raised through the public scoping period and consultation and coordination with Tribes and Cooperating Agencies; 2) issues raised by agency resource specialists; and 3) applicable planning criteria. In addition to the No Action Alternative and the Proposed Action Alternative, the BLM identified one Action Alternative (the Wash Avoidance Alternative) to analyze in detail.

The BLM has identified the Wash Avoidance Alternative as the preferred alternative. In selecting preferred alternatives, the BLM aims to focus stakeholder review of the Draft EIS while retaining the ability to consider project elements that balance energy production with reducing the potential for adverse impacts.

The BLM decision maker may select various components from each of the alternatives analyzed in the Draft EIS. The decision maker considers the purpose and need for federal action, identified impacts, public comments, and information from Cooperating Agencies, Tribes, and consulting parties to make a decision that considers resource values and provides for balanced use of the public lands.

The BLM encourages the public to review and provide comments on the Draft EIS related to the adequacy of the alternatives, analysis of effects, and any new information that would help the BLM disclose potential impacts of the Project in the final EIS.

The Draft EIS is available on the Project website at: https://eplanning.blm.gov/eplanning-ui/project/2017881/510. A virtual public meeting will be held to provide the public with the opportunity to learn more about the Project, submit comments and seek additional information. The date and time of the meeting will be announced at least 15 days prior to the meeting via a press release and on the Project website. Draft EIS hard copies are available for public review at the BLM's Yuma Field Office, 7341 E 30th Street, Suite A, Yuma, AZ 85365-6525.

Public comments will be accepted for 45 calendar days following the U.S. Environmental Protection Agency's publication of the notice of availability in the *Federal Register*. Comments must be in writing and may be provided in the following ways:

- ePlanning website: https://eplanning.blm.gov/eplanning-ui/project/2017881/510
- Via email to: BLM_AZ_CRD_SOLAR@BLM.gov
- Via hand delivery or postal mail to:
  BLM Yuma Field Office, Attn: Jove Solar EIS
  7341 E 30th Street, Suite A
  Yuma, AZ 85365-6525
- Via fax to: (928) 317-3250

Before including your address, telephone number, email address, or other personal identifying information in your comment, be advised that your entire comment, including your personal identifying information, may be made publicly available at any time. Although you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

Thank you for your interest in the Jove Solar Project.

Sincerely,

Digitally signed by
RAYMOND CASTRO
Date: 2024.04.11
07:49:20 -07'00'

Raymond Castro Jr.
Field Manager, Yuma Field Office

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Executive Summary

Introduction

This Environmental Impact Statement (EIS) was prepared by the Department of the Interior, Bureau of Land Management (BLM). The BLM is the Lead Agency pursuant to the National Environmental Policy Act (NEPA). This EIS analyzes the effects of granting a right-of-way (ROW) to construct the Jove Solar Project (Project) as described in the plan of development submitted by Jove Solar, LLC (Applicant). In addition to the Proposed Action, the EIS analyzes the No Action Alternative and one Action Alternative that is a modification of the Proposed Action.

Purpose and Need

Lands administered by the BLM are managed under principles of multiple use and sustained yield that consider the long-term needs of future generations for renewable and nonrenewable resources. The BLM is authorized to grant ROWs on public lands for systems of energy generation, transmission, and distribution (Federal Land Policy and Management Act Title V §501(a)(4)). The BLM's purpose and need for this action is to respond to the ROW application submitted by the Applicant to construct, operate and maintain, and ultimately decommission the Project. The BLM will decide whether to deny the proposed ROW, grant the ROW, or grant the ROW with modifications. The BLM may include any terms, conditions, and stipulations it determines to be in the public interest and may issue a grant that modifies the proposed use or changes the location of the proposed facilities (43 Code of Federal Regulations [CFR] 2805.10(a)(1)).

Several other agencies have been identified as cooperating or participating agencies. The purpose and need for each of these agencies is to respond to authorization requests for permits and approvals where these agencies have jurisdiction by law or to provide special expertise with respect to an environmental impact that could result from the Project or its alternatives (40 CFR 1508.5).

Applicant's Objective

The Applicant's objective is to construct, operate, and maintain a clean, domestic, renewable source of solar electricity generation that helps meet the region's growing demand for power, and which helps fulfill state and national renewable energy and greenhouse gas emissions goals. Arizona's Renewable Portfolio Standard established the objective of achieving 15 percent of the state's energy from renewable sources by 2025, and the Project would contribute approximately 600-megawatts (MW) to meet energy demand.

Proposed Action

The Applicant is requesting BLM authorization of a 30-year ROW to construct, operate, maintain, and decommission a 600-MW photovoltaic (PV) solar electric generating facility and ancillary facilities.

The Project would be in southeastern La Paz County, Arizona, about 85 miles west of Phoenix, 30 miles west of the community of Tonopah, and—at the closest—approximately 1.5 miles south of Interstate 10 (I-10). The Project facilities would require 3,495 acres of BLM-managed land and 38 acres of La Paz County land. The Project would include up to 1.2 million PV modules, cabling, and power conversion stations (PCSs), 69-kilovolt (kV) overhead and underground collector lines, an operation and maintenance facility, two substations, internal access roads, perimeter fencing, water storage tanks for holding construction water, and appurtenant facilities adjacent to the Cielo Azul Substation to support interconnection of the Project. The Project would connect to the Ten West Link 500 kV transmission line (construction underway) via a proposed 1.5-mile generation tie-in (gen-tie) line. The Project may construct an on-site battery energy storage system to store up to 1,200 megawatt-hours (MWh) of electricity.

Alternatives

Several potential alternatives were identified during scoping and considered by the Applicant and the BLM. Of the various alternatives considered, the No Action Alternative, the Proposed Action, and one alternative to the Proposed Action are analyzed in the EIS. The Wash Avoidance Alternative would avoid construction in a desert wash that would occur under the Proposed Action.

Public Involvement with the EIS

SCOPING AND PUBLIC COMMENT

Several opportunities for public input occurred during the NEPA decision-making process. The BLM published a notice of intent (NOI) to prepare an EIS for the Project in the *Federal Register* on December 7, 2022. The BLM hosted two public scoping meetings for the Project: one in-person meeting in Tonopah, Arizona, at the Tonopah Valley High School on January 11, 2023; and one virtual meeting via Zoom Webinar on January 17, 2023. The in-person public scoping meeting began at the poster stations set up around the lobby, was followed by a formal presentation in the auditorium, and concluded at the poster stations for questions and answers with subject matter experts. The virtual public scoping meeting began with a formal presentation followed by questions and answers from the audience. Subject matter experts from the BLM, the Applicant, and the BLM's NEPA consultant (Stantec Consulting Services Inc.) staffed the public scoping meetings.

The BLM received 19 emails and letters during the scoping period, with 145 individual comments. The public comment period concluded 15 days after the last public scoping meeting (February 1, 2023). A Scoping Report summarizing the scoping process and comments received is available on the Project ePlanning website.

SCOPING COMMENTS

Comments made during scoping by the public and agencies that are relevant to the environmental analysis are detailed in Table ES-1. Several other resource topics in addition to those listed in the table are analyzed in the EIS, including Land Use, Paleontological Resources, and Travel and Transportation.

Table ES-1 Topics of Concern Raised During Scoping

Resource Category	Topics of Concern	
Air Quality	Air Quality Climate Change	Air Quality Management Greenhouse Gases
Biological Resources	Ecosystems/Habitat Threatened and Endangered Species Weeds/Invasive Species	Sensitive Species General Wildlife Migratory Birds
Cultural and Historic Resources; Native American Concerns	Native American Traditional	Religious
Cumulative Impacts	Cultural Resources Recreational Access Wildlife	General Analysis Visual
Environmental Justice / Socioeconomics	Livestock Grazing Recreational Access	Multiple Use User Conflicts
Process	Alternatives Coordination/Consultation Effects Analysis Project Location	Comment Period Decision Process Mitigation Purpose and Need
Project Design	Buffers Lighting Monitoring	Infrastructure Mitigation
Public Health & Safety	Air quality	
Recreation	Dispersed Camping Public Access	Management
Soil Resources	Management	Reclamation, Reclamation Bond
Vegetation	Disturbance, Erosion Native Plants Vegetation and Invasive Species Management	Fire Management Plant Species
Visual Resources	National Wildlife Refuge, Wilderness Area	
Waste and Hazardous Waste	Waste generation	
Water Resources	Water Quality	Water Quantity

Comparison of Effects

This EIS analyzes the anticipated effects of the No Action, Proposed Action, and Action Alternatives on various resources (Table ES-2). The No Action Alternative is not included in the summary table because the Project would not be built; therefore, it would have no effect on any of the environmental resources listed, and energy needs would continue to be secured from existing sources.

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Table ES-2 Comparison of Effects of the Proposed Action and the Wash Avoidance Alternative

Sector	Potential Effect	Proposed Action	Wash Avoidance Alternative
Air Quality (Section 3.2)	Air quality from emissions and fugitive dust	Construction activities from the Proposed Action would produce air pollutant emissions from construction equipment exhaust, exhaust from employee and delivery vehicles, and fugitive dust from soil disturbance and travel on unpaved roads. Construction emissions would be temporary and would have short-term air quality impacts only for the duration of the construction phase of the Project. The overall construction period is estimated to be approximately 12–18 months. The total pollutants emitted from the Project's construction would be much smaller than the total projected annual emissions for La Paz County. Operation and maintenance activities from the Proposed Action would produce air pollutant emissions from employee and maintenance vehicles' exhaust. The total pollutants emitted from Project operation would be much smaller than the total projected annual emissions for La Paz County. The cumulative effect of operation, however, would likely be a net decrease in air pollutant emissions as operation of solar plants are cleaner than the operation of fossil fuel plants. Decommissioning emissions would be similar to construction emissions. Fugitive dust emissions would be due to the removal—rather than the installation—of equipment, fences, and buildings.	Air quality impacts under the Wash Avoidance Alternative would be similar to those identified for the Proposed Action.
Air Quality (Section 3.2)	Greenhouse gas (GHG) emissions from construction equipment and vehicles; climate change	Construction activities from the Proposed Action would produce GHG emissions from construction equipment exhaust and exhaust from employee and delivery vehicles. GHG emissions for the construction phase of the Project would appear to be insignificant due to the small percentage of the La Paz County GHG emissions inventory that they represent. Operational activities from the Proposed Action would produce GHG emissions from exhaust from employee and maintenance vehicles. The total pollutants emitted from Project operations would be much smaller than the total annual emissions for La Paz County. Decommissioning emissions are estimated to be less than construction emissions because fewer vehicles and equipment would be required to complete the work.	Climate change impacts under the Wash Avoidance Alternative would be similar to those identified for the Proposed Action.
Biological Resources (Section 3.3)	Native vegetation	The Proposed Action would result in the disturbance of soil and vegetation on up to 3,533 acres within the Project area. Soil and vegetation disturbance provides opportunities for the establishment of non-native plants. Vehicles can transport seed or propagules of non-native plants which could increase the fuels for potential wildfires and which could directly cause wildfires. Construction activities can also result in changes in the plant communities within and outside of the Project area, and decreased soil stability, increased erosion, and decreased watershed health within the Project area. Temporary disturbance areas would be revegetated following construction. During operation and maintenance, traffic levels into the Project area would decrease significantly, but would remain approximately double preconstruction levels. Surface disturbance and potential wildfire ignitions from vehicle usage would continue with Project operation and maintenance. Decommissioning would have similar levels of surface disturbance and potential for wildfire ignitions, but it would culminate in revegetation with native plant species. Revegetation in arid systems like the Sonoran is difficult, and a successful outcome is dependent on both methodology and other factors that the Applicant cannot control such as weather and climate.	The Wash Avoidance Alternative would avoid construction within the desert wash that crosses the Project area generally from west–southwest to east–northeast, reducing ground disturbance and erosion, retaining native vegetation to support soil stability, and supporting watershed health.
Biological Resources (Section 3.3)	General wildlife and migratory birds	The Project would permanently disturb and fence up to 3,533 acres of wildlife habitat under the Proposed Action, reducing resources for wildlife and negatively impacting habitat connectivity for wildlife. Travel into the Project area would increase by 750 percent during construction. Construction activities would require a workforce of between 10 and 600 employees, and the resulting human disturbance would directly and indirectly affect local wildlife through avoidance of infrastructure and personnel and through potential collision mortality. Effects of human and vehicle disturbance during construction are temporary and limited to the duration of the activities. While some temporary disturbance areas would be revegetated following construction, habitat modification from the changes in vegetation and the installation of equipment and infrastructure would continue to affect wildlife during operation and maintenance of the Project through restoration. Soil and vegetation disturbance provides opportunities for the establishment of non-native plants. Increased vehicle traffic could transport seeds of non-native plants resulting in potentially increased fuels for wildfires and could directly cause wildfire ignitions. These activities could result in changes in the plant communities within and outside of the Project area that may negatively affect habitat for wildlife. The effects of the Proposed Action on migratory birds are the same as those described for General Wildlife. Solar development can create sources of bird mortality from collision with panels, fencing, and powerlines. Additionally, human disturbance has the potential to disturb or destroy migratory bird nests during the construction, operation and maintenance, and decommissioning phases. During operation and maintenance activities under the Proposed Action, traffic levels into the Project area would decrease significantly but would remain approximately double preconstruction levels. Human disturbance would continue to affect wildlife during operation and maintenance. Disturbance and potential wildfire ignitions from vehicle usage would also continue within the Project area during operation and maintenance activities.	The Wash Avoidance Alternative is the same as the Proposed Action but would avoid construction within the desert wash that crosses the Project area generally from west–southwest to east–northeast. This alternative would reduce ground disturbance within the wash, also retaining existing native vegetation to support habitat for wildlife and a potential corridor to allow the movement of wildlife through the Project area. Where compatible with National Electric Codes, the Wash Avoidance Alternative would include the installation of wildlife-friendly fencing specific to diverse types of wildlife to achieve permeability across sites. Specifically, fencing with larger holes to allow small and medium species to pass through. The northeastern terminus of the corridor ends just south of the CAP canal and I-10. There is no information on which species might use the potential habitat within the corridor or use the corridor to pass through the Project area. Outside of the no-build area, the Wash Avoidance Alternative retains all other direct and indirect effects on biological resources described in the Proposed Action.

Sector	Potential Effect	Proposed Action	Wash Avoidance Alternative
		Decommissioning activities under the Proposed Action would have similar levels of disturbance and potential for wildfire ignitions but would culminate in revegetation with native plants. Revegetation in arid systems like the Sonoran is difficult, and a successful outcome is dependent on both methodology and other factors that the Applicant cannot control, such as weather and climate.	
Biological Resources (Section 3.3)	Threatened and endangered species	The effects of the Proposed Action on T/E species habitat are the same as those described for General Wildlife. The 3,533 acres that would be impacted represent potential habitat for monarch butterflies and Sonoran pronghorn, and potential stopover habitat for Yuma Ridgeway's rails. Effects may include mortality or loss of habitat for monarch butterflies due to pesticide usage, collision mortality for Yuma Ridgway's rails and Sonoran pronghorn, and disturbance due to traffic and human activity for Sonoran pronghorn during operation and maintenance. In addition to the 3,533 acres that would be directly impacted for these species, an additional 18,241 acres (a 1-mile buffer around the Project) may be impacted through disturbance of Sonoran pronghorn by vehicular traffic and other human activities.	The effects of the Wash Avoidance Alternative would be generally the same as discussed for the Proposed Action. The corridor would leave native vegetation in place where it is most dense, providing potential breeding, foraging, and thermal cover in place for monarch butterflies, and possibly act as a movement corridor for Sonoran pronghorn. There is no information available to determine the likelihood of Sonoran pronghorn using the Wash Avoidance Alternative's no-build area.
Biological Resources (Section 3.3)	BLM sensitive species	The effects of the Proposed Action are the same as those described for General Wildlife. Effects may include collision mortality for BLM sensitive bat species and habitat loss or avoidance of artificial lighting during the operation and maintenance phase. Effects for the Sonoran Desert tortoise may include traffic mortality and indirect predation effects during the construction and operation and maintenance phases.	The effects of the Wash Avoidance Alternative would be the same as discussed under General Wildlife. The no-build area would leave native vegetation in place where it is most dense, providing potential foraging habitat for BLM sensitive bat species. This alternative would reduce ground disturbance within the desert wash, thereby retaining existing native vegetation to support habitat for wildlife and a potential corridor to allow the movement of wildlife, like the Sonoran Desert tortoise, through the Project area. There is no information available to determine the likelihood of tortoises using the corridor, and the northeastern terminus of the corridor ends just south of the CAP canal and I-10, which would limit further movement.
Cultural Resources (Section 3.4)	Cultural and Tribal resources	Under the Proposed Action, six NRHP-eligible cultural resources could be impacted by the Project through physical disturbance during construction, operations, and maintenance. These include five prehistoric artifacts scatters. A segment of the Palomas-Harquahala Road may be disturbed or destroyed. However, it is a non-contributing portion of the Palomas-Harquahala Road site because the segment lacks integrity and does not convey the significance of the larger resource. No further preservation or mitigation efforts would be necessary for this segment of the Palomas-Harquahala Road.	This alternative would avoid the desert wash that trends east–west through the Project area, in addition to several other environmentally sensitive areas. All NRHP-eligible cultural resources, other than the non-contributing segment of the Palomas-Harquahala Road, would be avoided by Project construction, operations, and maintenance. The Wash Avoidance Alternative would result in no adverse effect to NRHP-eligible cultural resources.
Cultural Resources (Section 3.4)	Native American religious concerns/Tribal resources	The Proposed Action would result in the loss of the Project area as intact desert landscape and would result in any economically important plant and animal taxa being disturbed, displaced, or potentially destroyed. Additionally, vehicular travel is expected to increase by over 750 percent during construction and by 114 percent during operations. Potential indirect effects include establishment and expansion of invasive plants, increased potential for wildfire that may result in additional habitat loss, increased human disturbance, and increased vehicular mortality of wildlife, including rabbits and deer. Project fencing would be a barrier for both people and wildlife and would require alternate routes of travel. The Proposed Action could adversely affect six NRHP-eligible prehistoric cultural resources unless these sites could be avoided by Project design. Viewshed impacts to locations of Tribal concern may result depending on the location of Tribal use areas. In more distant, expansive views, the Proposed Action would result in weak contrast as it would be contained within the background zone.	The Wash Avoidance Alternative is the same as the Proposed Action but would avoid construction within the desert wash that crosses the Project generally from west–southwest to east–northeast. This alternative would reduce ground disturbance within the wash and would also retain existing native vegetation to support habitat for wildlife and a potential corridor to allow the movement of wildlife and people through the Project area. The Wash Avoidance Alternative would have no adverse effects on the six NRHP-eligible prehistoric cultural resources as they would be avoided. Visual impacts would be similar to the Proposed Action.
Soil Resources (Section 3.5)	Soils	Ground disturbance would impact soils through loss of vegetation, topsoil mixing, burial and compaction of soil crusts, soil horizon mixing, and seedbank disturbance. Interim reclamation would revegetate areas to a state as close to pre-project conditions as possible, as defined by the Applicant's reclamation plan, with success criteria approved by the BLM. Soil impacts in temporary construction areas due to loss of vegetation and seed bank disturbance would be present for at least five years following reclamation—depending upon the success of restoration—though impacts from topsoil and soil horizon mixing may be permanent. Approximately 2,747 acres would be disturbed by Project infrastructure for the duration of the Project through decommissioning, and it would take up to 40 years following reclamation for native Sonoran Desert vegetation to reestablish. The entire Project would include ground disturbance of 3,533 acres. Because the Harquahala Valley is over 300 square miles, the Project's impact on the soil resources in in the area would be minimal	All Design Features described for the Proposed Action would also be applied to the Wash Avoidance Alternative, which would, in addition, avoid construction within the desert wash that crosses the Project from southwest to northeast. This alternative would reduce impacts to the soil resources in that area of the Project. Also, the Wash Avoidance Alternative would require a soil and vegetation plan.
Public Health and Safety (Section 3.6)	Worker and public health and safety	All construction, operation and maintenance, and decommissioning contractors and subcontractors would be required to operate under a health and safety program approved by OSHA and the BLM's industry standards. Additionally, a health and safety plan would be developed with the final POD. Site safety procedures would address a zero-injury safety policy; responsibilities and roles of personnel, health and safety for subcontractors; worker safety orientation and training; severe weather conditions; and accident/incident reporting procedures. The site safety procedures also	The effects would be the same as effects described under the Proposed Action.

Sector	Potential Effect	Proposed Action	Wash Avoidance Alternative
		outline employee safe work programs, including drug and alcohol policies, hazardous materials, fire protection, respirator use and maintenance, confined workspaces, and potential work hazards such as blood-borne pathogens, electrical hazards, and environmental dangers. Prior to construction, the Applicant would conduct a safety assessment to identify potential safety issues and to develop measures that would be employed to mitigate them. The health and safety plan would be developed to protect workers and the public during construction. The Project would also implement a WEAP to communicate environmental issues, spill prevention and response measures, site-specific physical conditions for hazard prevention, and review of Project BMPs, the health and safety plan, the hazardous materials and waste management plan, and spill prevention and response plan. Implementation would minimize the risk of worker health and safety during construction, operation, and decommissioning to a minor effect.	
Public Health and Safety (Section 3.6)	Valley fever	Implementation of dust control measures outlined in the Project fugitive dust control plan would minimize the risk of exposure to Valley Fever for workers and the public during construction and decommissioning to a minor, short-term effect. If Valley Fever is thought to be a concern, the Project would contact the state/local health services for data reports of known Valley Fever fungus locations. If no data are available for the work area, the Project would test soils to conclude there is no risk or incorporate additional precautions to protect workers when projects are located in areas where the *Coccidioides* fungus is present. Worker protection measures and worker training specifically minimize exposures to this fungus. The Project would use approved methods and procedures to reduce the potential hazards from dust exposures to employees, and incorporate additional awareness of common symptoms and precautions to protect workers.	The effects would be the same as effects described under the Proposed Action.
Public Health and Safety (Section 3.6)	Unexploded ordnance (UXO)	Measures would be required to address the possibility of UXO. A BLM-approved plan would be developed before the onset of site mobilization or construction that includes assessment; training; and UXO recognition, retreat, and reporting procedures. With implementation of required plans and subsequent management actions, Design Features, and BMPs described as part of this Action Alternative, impacts would be negligible.	The effects would be the same as effects described under the Proposed Action.
Public Health and Safety (Section 3.6)	Traffic and transportation	A traffic and transportation plan would be drafted to provide safety procedures and minimize impacts on traffic flow in the Project area. Traffic management procedures would be designed to minimize potential hazards from increased truck traffic and worker traffic and to minimize impacts to traffic flow in the Project area. With implementation of the Project traffic and transportation plan, Project construction, operation and maintenance, and decommissioning would not affect traffic and transportation.	The effects would be the same as effects described under the Proposed Action.
Land Use (Section 3.7)	Land use designations	The Proposed Action would be subject to land use approvals from applicable landowners and jurisdictions, including the BLM and La Paz County. The Project area would span 3,495 acres administered by BLM and 38 acres of La Paz County land. Additional approvals may be required from the EPA, USFWS, Bureau of Reclamation, AZGFD, and ADEQ. The Project area is not located within any BLM special land use designations. The Project would be located in a REDA designation in accordance with the RDEP ROD and within a variance area identified through the BLM Western Solar Plan. As such, the Project is located within a land area with low known resource sensitivity. Further, as the Project is over 20 MW, it would be required to conform to the BLM RDEP Appendix B, Design Features, Required Plans, and BMPs. Therefore, the Project would implement the Design Features, required plans, and BMPs. Compliance with the BLM RDEP Design Features and any conditions of approval for the BLM ROW grant would help ensure that the Project would not affect land use designations, and the Project would be consistent with the applicable plans and policies. Effects would be negligible. Project areas outside of BLM-administered land in La Paz County are zoned Rural Agricultural. The Rural Agricultural zoning district is intended to apply to rural areas, on large parcels, for permanent dwellings with agricultural uses, and to support agricultural and open space uses. With approval of the conditional use permit by La Paz County, the Project would be permitted and would not conflict with any land use plans, policies, or regulations. Effects would be negligible.	The Wash Avoidance Alternative would avoid construction within the desert wash that crosses the Project from west–southwest to east–northeast. This would preserve the channel floodplain and maintain connectivity of comparatively high-value wildlife habitat and would avoid three known areas of environmental sensitivity. Otherwise, the Wash Avoidance Alternative proposes similar Project components within the same Project area as the Proposed Action, and all Design Features described for the Proposed Action would also be applied to the Wash Avoidance Alternative. The effects would be the same as effects described under the Proposed Action.
Land Use (Section 3.7)	Authorized uses	The development of currently natural or undeveloped land for a new solar facility and ancillary facilities would be a major change within the Project area. Existing authorized uses such as grazing and limited recreation activities would be precluded on approximately 3,495 acres during construction and operation. Grazing permittees would receive compensation for their contribution to grazing improvements.	The Wash Avoidance Alternative would avoid construction within the desert wash that crosses the Project from west–southwest to east–northeast. This would preserve the channel floodplain and maintain connectivity of comparatively high-value wildlife habitat and would avoid three known areas of environmental sensitivity. Otherwise, the Wash Avoidance Alternative proposes similar Project components within the same Project area as the Proposed Action, and all Design Features described for the Proposed Action would also be applied to the Wash Avoidance Alternative. The effects would be the same as effects described under the Proposed Action.
Land Use (Section 3.7)	Rights-of-way	Implementation of the Project would not alter existing land ownership. Infrastructure would be sited to avoid impacting existing ROWs as necessary. Access to previously discussed ROWs may be temporarily affected during construction; however, the ROWs would not be precluded by construction. If access roads would cross existing underground utilities, the crossing sites would be designed to be protective of the underground utilities. If the Project is authorized, the Project would have to conform to the terms and conditions of other previously issued BLM ROWs in the Project footprint, if applicable. Coordination and outreach with existing authorized users would be completed for the Project to help	The Wash Avoidance Alternative would avoid construction within the desert wash that crosses the Project from west–southwest to east–northeast. This would preserve the channel floodplain and maintain connectivity of comparatively high-value wildlife habitat and would avoid three known areas of environmental sensitivity. Otherwise, the

Sector	Potential Effect	Proposed Action	Wash Avoidance Alternative
		ensure that the Project avoids impacts to existing uses. Other authorized land uses may experience minor displacement during construction; however, temporary use areas would be returned to their existing conditions in accordance with BLM requirements. Standard BLM authorizations for ROW grants, in accordance with Title V of the FLPMA, as amended, (43 USC 1761–1771) would apply for all portions of BLM-administered land that would be included in the Project. The Project has no direct effects to the authorized and pending ROWs identified. Impacts during decommissioning would be the same as those under construction. After decommissioning, other ROW uses would be able to resume.	Wash Avoidance Alternative proposes similar Project components within the same Project area as the Proposed Action, and all Design Features described for the Proposed Action would also be applied to the Wash Avoidance Alternative. The effects would be the same as effects described under the Proposed Action.
Livestock and Grazing Management (Section 3.8)	Non-native vegetation and rangeland health	Construction would result in the disturbance of soil and vegetation on up to 3,495 acres within the Project area. Soil and vegetation disturbance provides opportunities for the establishment of non-native plants. Increased vehicle traffic can transport seed or propagules of non-native plants and result in potential wildfire ignitions. These activities can result in changes in the plant communities, and decreased soil stability, increased erosion, and decreased rangeland health within the Project area. Temporary impact areas would be revegetated following construction. During operation and maintenance, traffic levels into the Project area would decrease significantly but would remain approximately double preconstruction levels. Surface disturbance and potential wildfire ignitions from vehicle usage would continue within the Project area during operation and maintenance activities. Decommissioning would have similar levels of surface disturbance and potential for wildfire ignitions but would culminate in revegetation with native plant species.	The Wash Avoidance Alternative would avoid construction within the desert wash that crosses the Project area generally from west–southwest to east–northeast, reducing ground disturbance and erosion, retaining native vegetation to support soil stability, and supporting rangeland health. The desert wash segment that is the subject of this Action Alternative is within the K Lazy B allotment.
Livestock and Grazing Management (Section 3.8)	Grazable acres and stocking rates	The Proposed Action would result in the fencing and suspension of up to 3,495 acres of public grazing lands within the Project area. The Project would impact 0.35 percent of the Clem allotment and 2.2 percent of the K Lazy B allotment and has the potential to affect a total of approximately 43 AUMs. Changes in non-native plants and wildfire risk from the Project have the potential to affect additional grazable acres and stocking rates on lands outside the Project area. During operations and maintenance activities under the Proposed Action, the lands within the Project area would remain suspended from public grazing. Changes in non-native plants and wildfire risk from the Project have the potential to affect additional grazable acres and stocking rates on lands outside the Project area. Decommissioning activities under the Proposed Action would culminate in revegetation with native plant species. However, the lands within the Project area may not be released from suspension of grazing activities until those lands are deemed to be recovered by the BLM.	The Wash Avoidance Alternative would avoid construction within the desert wash that crosses the Project area generally from west–southwest to east–northeast, resulting in a minor increase in remaining grazable acres for the K Lazy B allotment.
Livestock and Grazing Management (Section 3.8)	Access for grazing permittees and livestock	The Proposed Action would result in the fencing and suspension of up to 3,495 acres of public grazing lands within the Project area. Public access, including access for grazing permittees, would be maintained via the AT&T Frontage Road. Only the Project site would be fenced, and use of and access to other pastures and water sources would remain open. During operation and maintenance activities under the Proposed Action, the lands within the Project area would remain suspended from public grazing. Public access, including access for grazing permittees, would be maintained via the AT&T Frontage Road. No additional fencing or water access issues are expected for the grazing permittees. Decommissioning activities under the Proposed Action would culminate in revegetation with native plant species. However, the lands within the Project area may not be released from suspension of grazing activities until those lands are deemed to be recovered by the BLM.	The Wash Avoidance Alternative would avoid construction within the desert wash that crosses the Project area generally from west–southwest to east–northeast on the K Lazy B allotment. Public access would be maintained through the Project area via the AT&T Frontage Road. No additional fencing or water access issues are expected for the grazing permittees.
Paleontological Resources (Section 3.9)	Paleontological resources	Under the Proposed Action, ground disturbance would occur on up to 3,533 acres. The extent, nature, and depth of ground disturbance is not known at this time. Geologic mapping shows approximately 98.3 percent of the Project area in the Proposed Action (3,473.76 acres) is mapped as various types of Holocene-aged surficial deposits (that is, young alluvium, mixed eolian and young alluvial deposits, and young channel and low terrace deposits along axial washes), with low (PFYC 2) paleontological potential. Approximately 1.7 percent (59.77 acres) of the area is mapped as younger intermediate alluvial fan and terrace deposits that date to the late Pleistocene, with unknown (PFYC U) paleontological potential. Surficial activities in these areas mapped as sediments with low (PFYC 2) paleontological potential are unlikely to have an effect on paleontological resources. Surficial activities in areas mapped as sediments with unknown (PFYC U) paleontological potential or subsurficial activities that exceed the depth of the low-potential surficial sediments may encounter paleontological resources. Should paleontological resources be damaged or destroyed by Project activities, it would constitute a direct adverse effect. With the implementation of the SWPPP and restoration plan, combined with the generally flat terrain of the Project area, indirect effects through increased erosion are unlikely. As most of the Project area is too young to preserve fossils, the increased human presence is unlikely to pose adverse effects to paleontological resources.	The Wash Avoidance Alternative would share the same overall footprint as the Proposed Action but would avoid construction within the desert wash that crosses the Project generally from west–southwest to east–northeast. Under the Wash Avoidance Alternative, ground disturbance would occur on up to 3,375.94 acres. The extent, nature, and depth of ground disturbance is not known.

Sector	Potential Effect	Proposed Action	Wash Avoidance Alternative
Socioeconomics and Environmental Justice (Section 3.10)	Socioeconomics	Construction: Community Services • In-migration due to construction is expected to be minimal; however, workers could migrate temporarily into the area from other counties or adjacent states during construction. Laborers and contractors may be drawn throughout the region, including Phoenix, Yuma, and Southern California. This would create short-term and temporary impacts to the community services for La Paz County and Quartzsite by potentially putting more stress on community services, like schools and emergency services. Traffic would approach the site from major roadways designed and capable of handling high volumes, including an interstate. There are no commercial or residential areas near the site, so the increase in traffic would not affect any local populations. Employment • Construction of the Project is likely to temporarily decrease the level of unemployment in La Paz County. The effects on regional employment as a result of constructing the Project would be minor but beneficial. During construction, an estimated average of 300 workers would be employed, with peak employment at approximately 600 workers. The spring and fall seasons would be busiest, while local weather is favorable, which would not interfere with the winter migrant populations. Following principal construction, the workforce would reduce from the peak of 600 employees to less than 20 employees. The Applicant would employ qualified local and non-local contractors and subcontractors according to the equipment and personnel needs of the Project. Workers may be drawn throughout the region, with local in-demand skills likely having an advantage in bids due to their proximity to the Project. Local hiring would depend on the availability of workers with the appropriate skills. Housing Availability • No temporary or permanent on-site housing would be provided for construction, operation and maintenance, or decommissioning workers. The workers who migrate from other counties and states would occupy a nominal amount of the available vacant rental housing in La Paz County. No substantial adverse effects on regional housing would occur due to the presence of RV that would fully support an increase of potentially 300–600 construction workers. However, there could be slight impacts from additional persons temporarily occupying the RV parks in the winter months due to the influx of seasonal migrant populations to the area. Local and Regional Economy • The construction workers would increase tax receipts for the area by consistently buying supplies, food, and lodging locally, and associated expenditures. Construction of the Project will result in increased state and local sales tax revenues associated with the purchase of some construction materials as well as goods and services consumed by the construction workforce. For instance, additional money will be spent locally on the purchase/rental of equipment and purchase of materials such as stone, concrete, fencing material, and bulk fuel. As available, these items and others required for construction will be purchased from local businesses near the Project. In addition, local communities will benefit from ad valorem taxes, paid annually by Jove Solar over the life of the solar facility. Spending on similar solar projects has been estimated to be approximately $20 million. This value takes into consideration the initial spending on the other solar projects plus workers salary and compensation. Residential Property Values • Construction would not have a negative or a positive impact on real estate values for adjoining or abutting properties. Operation and Maintenance • The effects of the Project's operation and maintenance would be significantly reduced as a small workforce would result in little to no effect on community services, employment, housing availability, local and regional economy, or residential property values. Taxes during operation will result in increased state and local sales taxes, and local communities will benefit from ad valorem taxes. Further, there will be no negative or positive impact on real estate values for adjoining or abutting properties. Decommissioning • The effects of Project decommissioning would be similar to the effects of construction in that there would be a temporary introduction of construction equipment and ground disturbance.	Construction, operation and maintenance, and decommissioning impacts on socioeconomic resources associated with the Wash Avoidance Alternative would be the same as those described for the Proposed Action.
Socioeconomics and Environmental Justice (Section 3.10)	Environmental justice	The small influx of workers would not displace any minority or low-income populations, as worker influx is expected to be minor into Quartzsite, approximately 30 miles from the Project. However, there may be some minor impacts to housing availability in local RV parks during the winter months when migrant populations move into the area. Environmental justice communities would benefit from potential jobs during construction of the Project. There would be little to no effect on the environmental justice communities from operation and maintenance due to the small-scale and sporadic work conducted during this period. The effects of Project decommissioning would be similar to the effects of construction in that there would be a temporary influx of workers.	Construction, operation and maintenance, and decommissioning impacts on environmental justice communities associated with the Wash Avoidance Alternative would be the same as those described for the Proposed Action.

Sector	Potential Effect	Proposed Action	Wash Avoidance Alternative
Travel and Transportation Management (Section 3.11)	Travel and transportation	Direct effects common to both Action Alternatives during the construction phase would consist of construction-related traffic that includes large trucks and potentially oversized loads. Increased traffic would occur on all types of roadways in the area, but would be phased, occurring at different locations at different times. An estimated 350 trips would be added to the roadway network during the morning and afternoon peak hours. The intensity of traffic impact from construction would be temporary and short-term, with low effect. The Project does not anticipate closing route access to the Eagletail Mountains Wilderness area during construction or operation and maintenance. Therefore, the Project would have no impact on access to the Eagletail Mountains Wilderness area. After construction, traffic generated by operation and maintenance activities would be intermittent and require a small number of vehicles, and deliveries would not regularly occur. Operation and maintenance traffic would add negligible traffic on primary roadways and, subsequently, would not decrease the LOS for any primary roads. Decommissioning activities would have generally the same impacts to traffic and transportation resources as described for construction.	Construction activities associated with the Wash Avoidance Alternative would result in the same temporary and short-term traffic impacts with low effect as those described for the Proposed Action. Under the Wash Avoidance Alternative, Project components such as solar arrays, stormwater features, buildings, etc. would not be constructed within 500 feet of either side of the centerline of the desert wash that crosses the northern portion of the Project area. While the Wash Avoidance Alternative would limit Project components within a portion of the Project area, there would be no significant traffic impacts as the solar arrays would be contained within the same footprint as the Proposed Action. As such, the Wash Avoidance Alternative would result in the same temporary and short-term traffic impacts with low effect as the Proposed Action. After construction, traffic generated by operation and maintenance activities would be intermittent, require a small number of vehicles only, and deliveries would not regularly occur. operation and maintenance traffic would add negligible traffic on primary roads and, subsequently, would not decrease the LOS for any primary roads. Decommissioning activities would have generally the same impacts to traffic and transportation resources as described for construction.
Visual Resources (Section 3.12)	Scenic quality	Construction • The Proposed Action would include construction of the solar facility and ancillary systems, such as the solar PV modules, inverters, collector system, BESS, substation, access roads, aboveground electrical connection line, and operation and maintenance building. Project construction activities would result in temporary visual impacts due to site preparation, grading, the generation of fugitive dust, and the presence of construction equipment, materials, debris, and staging areas. Site preparation would involve cutting shrubs near their base while leaving the root structure intact to minimize soil disturbance. Grading would generally maintain existing contours and would balance the high and low spots. • Construction activities would introduce forms, lines, colors, and textures that would create weak to moderate degrees of visual change to the landscape. The construction-related changes would primarily be visible in the foreground-middleground (0.5–3 miles). Intermittent airborne dust could become visible above construction activities in background views (3–15 miles) and potentially diminish visibility in views to the north and south. Moderate contrast during construction would be compatible with VRM Class III management objectives. The Project would spray water to control dust within the Project area in accordance with the Dust Abatement Plan. Upon completion of construction, equipment, materials, debris, and staging areas would be removed from the Project area. Therefore, temporary construction activities would not result in adverse effects to scenic quality. Operation and Maintenance • The Proposed Action would construct a solar facility, overhead electrical connection line, and ancillary systems within a landscape of moderate scenic quality, assessed as such based on the predominance of low, sparse, desert vegetation and modification by roadways, utility infrastructure, and gas facilities. The visual contrast rating analyses completed for the five KOPs determined that, while the Project would be visible in views from I-10 (KOP 1 and KOP 4), the south (KOP 2), the north (KOP 3), and to the southwest near Courthouse Rock (KOP 5), contrast with the existing conditions would range from weak to moderate. • In closer-in views, particularly from the adjacent roadways such as I-10 (KOP 1) and Palomas-Harquahala Road (KOP 2), the solar PV arrays would be prominent features within the foreground-middleground. The dark color and form of the Project would appear in place of the desert shrubland and grassland vegetation and would moderately contrast with the form, line, and color of the landscape. However, due to distance from the KOPs (about 1.5–4 miles) and the Project's relatively low profile, the solar PV arrays would not dominate views of the broader landscape. Motorists traveling along the nearby roadways, including I-10 and Palomas-Harquahala Road, are expected to have moderate sensitivity to changes within the landscape. The view duration and exposure to the Proposed Action from the nearby roadways would be relatively short as motorists would be traveling through the Project area at a high speed (that is, 40–65 miles per hour). • The overhead electrical connection line, substation, operation and maintenance building, and BESS would be noticeable within the foreground-middleground (KOP 1 and KOP 2). The overhead electrical connection structures would be relatively small features, visible at a distance from the nearby roadways (0.5–3 miles). While the structures would be new vertical features in the landscape, they would not be dominant elements	Construction activities associated with the Wash Avoidance Alternative would result in the same visual contrast and impact on scenic quality as those described for the Proposed Action. Under the Wash Avoidance Alternative, Project components, such as solar arrays, stormwater features, buildings, etc. would not be constructed within 500 feet of either side of the centerline of the desert wash that crosses the northern portion of the Project area. While the Wash Avoidance Alternative would limit Project components within a portion of the Project area, there would be no discernible difference in views of the Project as the solar arrays would be contained within the same footprint as the Proposed Action. As such, the Wash Avoidance Alternative would result in the same visual contrast and impact on scenic quality as the Proposed Action during operation and maintenance. The visual impacts from decommissioning the Wash Avoidance Alternative would be the same as those described for the Proposed Action. The site would undergo final cleanup and reclamation as outlined in the decommissioning and site reclamation plan. Areas disturbed during removal of Project components would be backfilled, recontoured, restored, and rehabilitated as near as possible to their preconstruction condition through implementation of the habitat restoration and integrated weed management plan.

Sector	Potential Effect	Proposed Action	Wash Avoidance Alternative
		and would relate to other similar vertical structures associated with the highway and the Devers-Palo Verde 500 kV transmission line. As such, they would not constitute a strong contrast with the existing scenic quality of the view. • In more distant, expansive views, the Proposed Action would result in weak contrast (KOPs 3, 4, and 5) as it would be contained within the background zone (3–8.5 miles away). The solar PV arrays would appear as relatively dark, narrow geometric forms along the base of the mountains. The vertical form of the overhead electrical connection line would appear at the horizon but would be mostly absorbed into the existing landscape and would not alter the existing visual character of the broader landscape. The surrounding vegetation, topography, and atmospheric conditions would further limit distant views of the Proposed Action as seen in the views from the Little Harquahala Mountains (KOP 3) and Courthouse Rock (KOP 5). • Overall, operation of the Proposed Action would result in weak to moderate contrast with the existing conditions, which would meet VRM Class III objectives for the Project area. The existing landscape character would be retained, and development would not dominate the view of the casual observer. Decommissioning • When the Project ceases operation, the facilities would be decommissioned and include removal of the solar PV arrays, electrical connection line, substation, and other ancillary facilities. Following the removal of the Project's facilities, the site would undergo final cleanup and reclamation as outlined in the decommissioning and site reclamation plan. Areas disturbed during removal of the Project's components would be backfilled, recontoured, restored, and rehabilitated as near as possible to their preconstruction condition through implementation of a habitat restoration and integrated weed management plan. • The effects of Project decommissioning would be similar to the effects of construction, in that there would be the temporary introduction of construction equipment and ground disturbance. However, compared to the construction phase, the decommissioning phase would reduce visual contrast as the solar PV arrays and ancillary structures would be removed from the Project area. Removal of the solar PV arrays and ancillary structures would result in bare soils, which could increase contrast with the surrounding lands dominated by shrublands. This contrast would be moderate within the foreground-middleground (0.5–3 miles); however, discernible contrast would decrease with distance (3–15 miles) and would appear increasingly absorbed into the desert landscape. Over time, visual impacts within the foreground-middleground would be reduced as the affected landscape is returned to preconstruction conditions through revegetation. As part of the habitat restoration and integrated weed management plan, native vegetation would be used for revegetating, where feasible, to establish a composition consistent with the form, line, color, and texture of the surrounding landscape. Edges of revegetated areas would be feathered to reduce form and line contrasts with the existing landscape. Therefore, decommissioning activities would not result in adverse effects to scenic quality.	
Visual Resources (Section 3.12)	Light and glare	Construction • Any nighttime construction activities would require lighting to provide worker safety and to meet applicable requirements. Such lighting could deteriorate nighttime conditions for travelers in the vicinity of the Project area. Nighttime construction lighting would, to the extent possible, be limited to active work areas and limited to times when necessary for safety and security. The Construction, Operation, and Maintenance Plan appended to the POD specifies that the lighting plan to be prepared for the Project would describe how lighting would be designed and installed to minimize night sky impacts during facility construction. Specifically, lighting would not exceed the minimum number of lights and brightness required for safety and security, lights would be directed downward or toward the area to be illuminated, and light fixtures would not spill light beyond the Project boundary. • Equipment typically used in construction contains glass and metallic surfaces. Glare from such sources is typically minimal and of low intensity such that it would not affect viewers in nearby areas. Operation and Maintenance • The operation and maintenance building would have downward pointing/full cutoff nighttime lighting (designed to limit light pollution upward or across the Project's boundaries) to minimize effects on dark night skies. The substation would be equipped with an outdoor "full cutoff" lighting system, which directs light downward. The lighting plan referred to above would also minimize night sky impacts during facility operation by adhering to the measures previously summarized and requiring switches, timer switches, or motion detectors so that lights operate only when the area is occupied. In general, lighting would be kept off when not in use. • The Jove Solar Project Visual Resources Technical Report concludes that the Project would not result in any substantial glare during operation. A separate glare analysis reported in the technical report accounted for the "backtracking" proposed by the Project, in which the resting angle of the solar arrays would be a five-degree tilt, as opposed to zero degrees, or flat. The SGHAT output indicated that all glare from the Project would be eliminated from views along the nearest segment of I-10 and from a set of representative observation points differing from the KOPs. This would include glare with potential (that is, yellow glare) or low potential (that is, green glare) to cause an after-image (that is, flash blindness) when observed prior to a typical blink response time. Decommissioning • Similar to the Project's effects during construction, any nighttime activities conducted as part of decommissioning would require lighting to provide worker safety and to meet applicable requirements. Such lighting could deteriorate nighttime conditions for travelers in the vicinity of	Construction • While the Wash Avoidance Alternative would reduce the total area within which construction activities would occur, there would be no discernible difference in light and glare effects associated with construction relative to the Proposed Action. Operation and Maintenance • There would be no substantial difference between operational lighting under the Wash Avoidance Alternative compared with that described for the Proposed Action. Lighting for the operation and maintenance building and substation would be the same, and there would be no substantive difference in Project components to which lighting plan measures would apply. • The same reduced glare effects from the "backtracking" proposed as part of the Project would be realized under the Wash Avoidance Alternative, which would maintain the same development footprint but have fewer panels without development within 500 feet of either side of the centerline of the desert wash. Decommissioning • Light and glare effects from decommissioning the Wash Avoidance Alternative would be the same as those described for the Proposed Action.

Sector	Potential Effect	Proposed Action	Wash Avoidance Alternative
		the Project area. However, lighting for any nighttime decommissioning activities would, to the extent possible, be limited to active work areas and limited to times when necessary for safety and security. The Construction, Operation, and Maintenance Plan appended to the POD specifies that the lighting plan to be prepared for the Project would describe how lighting would be designed and installed to minimize night sky effects during facility construction. It further specifies that all mitigation measures developed for the construction phase will be applied to similar activities during the decommissioning phase. • Equipment typically used during decommissioning contains glass and metallic surfaces. Glare from such sources is typically minimal and of low intensity such that it would not affect viewers in nearby areas.	
Water and Wetland Resources (Section 3.13)	Groundwater	A well would be installed on BLM land within the Project area, and water would be pumped from the well into temporary construction water storage ponds. The water would be used for compaction of electrical trenches and foundations, dust control, wheel washing, and non-potable water for the temporary construction trailer. The Project would require 900 acre-feet of water during the two-year construction period and 159 acre-feet of water during operation of the Project. Water may be withdrawn year-round throughout the two-year construction period. Groundwater withdrawals from the Project would represent approximately 0.00005 percent of the calculated groundwater quantity of the Ranegras Plain Basin and would not result in a measurable impact to the basin, nor would it result in potential drawdown or land subsidence issues. Although construction would use approximately 85 percent of the total water required for the Project, some water use would be required during operation and maintenance and decommissioning for washing of equipment, potable water sources for on-site personnel, ongoing road maintenance, and dust control at a rate of 5.3 acre-feet per year. Minimal amount of continuous water use during operation and maintenance would be needed at the office and operation and maintenance buildings. The remaining water uses would withdraw water as needed, with some seasonal variation in water used for dust control. During the two-year decommissioning and reclamation period, water may be used continuously in low quantities for dust control.	The Wash Avoidance Alternative would result in the same impacts to groundwater in the Ranegras Plain Basin as described for the Project. Also, the Wash Avoidance Alternative would require a groundwater use plan.
Water and Wetland Resources (Section 3.13)	Surface water	Project siting and Design Features would avoid and minimize placement of Project infrastructure in stream features indicated by NWI data to the extent practicable. However, roads, electrical lines (which may be underground or overhead), or other Project infrastructure would cross some of these features. Work areas may require disturbance within some of these features. The actual number of riverine features that would be impacted would be determined for the Project's Clean Water Act Section 404 USACE permit once an alternative is selected and final wetland surveys are completed. During operation, ground disturbance in drainages would occur as needed for maintenance in work areas. However, this ground disturbance would occur in areas previously disturbed during Project construction. Decommissioning activities would have similar or lesser effects on stream features indicated by NWI data as construction and ground disturbance would occur in areas previously disturbed during construction. The roads in the Project area would be used to remove infrastructure and could be reclaimed as determined with the BLM. Any ground disturbance in stream features indicated by NWI data could change their function, change the rate and quantity of runoff from the fill footprint, compact soils, and alter flow patterns. Following decommissioning and successful reclamation (for example, recontouring and reconnecting hydrology, as needed), these stream features would be returned as close as possible to their natural state. In addition to the Design Features, the Project would require the development and implementation of a SWPPP, a Hazardous Materials and Waste Management Plan, and a Spill Prevention Control and Countermeasures Plan to minimize and avoid potential impacts to 1) surface water quality through stormwater discharge or disruption of soils and sediments, 2) surface water runoff due to expansion of non-permeable surfaces that could lead to surface erosion, and 3) inadvertent spills/leaks during construction and operation and maintenance that could impact surface water quality. In addition, if jurisdictional wetlands or waters of the U.S. are identified in the Project area and would be impacted, a USACE permit would be required for the Project.	All Design Features described for the Proposed Action would be applied to the Wash Avoidance Alternative, but this Action Alternative would avoid construction within the desert wash that crosses the Project from southwest to northeast. Doing so would minimize impact to the identified surface water resources in that portion of the Project area.

Key:
ADEQ-Arizona Department of Environmental Quality; **AUM**-animal unit months; **AZGFD**-Arizona Game and Fish Department; **BLM**-Bureau of Land Management; **BESS**-battery energy storage system; **CAP**-Central Arizona Project; **EPA**-U.S. Environmental Protection Agency; **FLPMA**-Federal Land Policy and Management Act; **GHG**-greenhouse gas; **KOP**-key observation point; **LOS**-level of service; **MW**-megawatt; **NRHP**-National Register of Historic Places; **NWI**-National Wetland Inventory; **OSHA**-Occupational Safety and Health Administration; **POD**-plan of development; **PFYC**- Potential Fossil Yield Classification; **PV**-photovoltaic; **RDEP**-Restoration Design Energy Project; **REDA**-Renewable Energy Development Areas; **ROD**-Record of Decision; **ROW**-right-of-way; **RV**-recreational vehicle; **SGHAT**-Solar Glare Hazard Analysis Tool; **SWPPP**-stormwater pollution prevention plan; **T/E**-threatened and endangered; **USACE**-United States Army Corps of Engineers; **USFWS**-U.S. Fish and Wildlife Serve; **UXO**-unexploded ordnance; **VRM**-visual resource management; **WEAP**-Worker Environmental Awareness Program

1 Introduction, Purpose, and Need

1.1 Introduction

Jove Solar, LLC is a wholly owned subsidiary of 174 Power Global (Applicant). The Applicant requests a 30-year right-of-way (ROW) grant (Proposed Action) to construct, own, operate, maintain, and decommission a utility-scale solar photovoltaic (PV) energy generating facility and to use roads for said construction, operation, and maintenance of the Jove Solar Project (Project) on public lands administered by the Bureau of Land Management (BLM), Arizona Colorado River District, Yuma Field Office (YFO). If approved, this Project would comply with the Federal Land Policy and Management Act (FLPMA), BLM ROW regulations, and other applicable Federal laws, regulations, and policies.

The BLM has prepared this Environmental Impact Statement (EIS) according to the requirements of the National Environmental Policy Act (NEPA) to disclose the anticipated effects of the Project and alternatives to the public. The EIS and Record of Decision (ROD) will document the BLM process to consider the ROW application and analyze its potential effects, including from Project elements proposed on non-public lands.

1.1.1 PROJECT OVERVIEW

The Project is proposed on lands administered by the BLM and on county and state land in La Paz County, Arizona. The Project location was selected based on numerous factors, especially its frequent clear skies, high insolation, and access to electric transmission. The Project would generate 600 megawatts (MW), connect to the Ten West Link 500 kV transmission line (construction underway) via a proposed generation transmission line, and require 3,495 acres of BLM-managed public land and 38 acres of La Paz County land (3,533 acres total).

Major Project components would include the following:

- Up to 1.2 million solar PV modules
- Direct current (DC) cabling and combining switchgear, above ground electrical connection lines, and temporary construction and laydown areas
- 120 power conversion stations (PCSs) (inverters), voltage collection systems, transformers, a substation, and monitoring and controls systems
- A single- or double-wide premanufactured operation and maintenance facility
- A potential battery energy storage system (BESS) that will be able to store up to 1,200 megawatt-hours (MWh) of electricity
- Generation transmission line: overhead 69 kilovolt (kV) connection lines would extend from a new Project substation for approximately 1.7 miles within a utility easement crossing La Paz County and state land to the Cielo Azul switching station

If approved, construction of the Project would begin once all applicable approvals and permits have been obtained. The Applicant anticipates Project construction, from site preparation and grading to commercial operation, would take 12–18 months.

1.1.2 PROJECT HISTORY AND VARIANCE PROCESS

Prior names for the Project include Orion Solar and Taurus Solar. The Applicant submitted an original ROW application to BLM on October 24, 2019, as Taurus Solar. The Applicant submitted an updated ROW application in April 2022. The Project is proposed on solar variance lands.

In conformance with the Western Solar Plan (BLM 2012), BLM considers ROW applications for utility-scale solar energy development on solar variance lands on a case-by-case basis, following a formal review process that includes meetings with appropriate Federal, state, and local agencies, Tribal Nations, and other stakeholders. An applicant must demonstrate that the Project would avoid, minimize, and/or mitigate, as necessary, impacts on sensitive resources and that it is compatible with Federal, state, and local plans (BLM 2012). Additionally, an applicant must demonstrate that the Project would be able to acquire all required permits and authorizations needed for the Project.

As part of the variance process, the Applicant conducted required preliminary meetings with the BLM, U.S. Fish and Wildlife Service (USFWS) and Arizona Game and Fish Department (AZGFD) at the BLM Arizona State Office on January 30, 2020. The Applicant submitted the application and plan of development (POD) and conducted public outreach, which included a preliminary public meeting to discuss the Project timeline, general specifications, planned transmission interconnection, and site selection on February 19, 2020. This was followed by preliminary outreach and coordination with Tribal Nations, the State Historic Preservation Office, resources agencies, and state and local agencies.

The BLM's variance process required that the Applicant meet with federal, state, and local agencies and the affected public. The variance process also required that the Project adhere to data collection and survey protocols prescribed by resources agencies. The Applicant's variance report concluded that the Project would avoid, minimize, and/or mitigate, as necessary, effects on sensitive resources and that the Project is compatible with state and local plans and can acquire all required permits and authorities to implement the Project. On December 7, 2021, the BLM Director concurred with the recommendation of the BLM Arizona State Director to approve a variance for the Project and allow it to proceed for further analysis and review under NEPA.

1.1.3 APPLICANT'S OBJECTIVE

The Applicant's objective for the Project is to provide solar-generated electricity to meet the region's current and future energy needs while providing a reliable, economical, and environmentally acceptable renewable energy resource in the region. The Project would help serve the increase in demand for low-carbon electric power in a manner that is consistent with Federal policy mandates and incentives for development of renewable energy resources, while avoiding and minimizing potential adverse impacts to the environment.

National and regional forecasts project an increase in energy demand continuing into the foreseeable future. Renewable energy, including solar PV generation, is expected to provide a larger component of a diverse electricity supply in the future. Several western states, including Arizona and California, have adopted renewable energy requirements or goals; and various national, regional, and state policies have been enacted to encourage and provide incentives for development of solar and other renewable energy projects.

1.2 Lead and Cooperating Agencies

The BLM is the lead Federal agency responsible for compliance with NEPA (including preparation of this EIS), consultation with Tribal Nations, and conducting consultations required by the National Historic Preservation Act (NHPA) and the Endangered Species Act (ESA) for this action.

Tribal Nations and other agencies that may have jurisdiction over, special expertise with respect to, or interest in the Project were invited to participate as cooperating agencies in preparation of this document. Participating and cooperating agencies will evaluate the resources potentially affected by the Proposed Action and cumulative effects areas and will analyze the effects that the Proposed Action or alternatives may have on them. Permits and approvals from other agencies or Tribal Nations that may be needed for the Project are listed in **Section 1.4.3**. The following have agreed to be cooperating agencies for the NEPA process for the Project:

- U.S. Army Corps of Engineers (USACE)
- U.S. Environmental Protection Agency (EPA)
- U.S. Fish and Wildlife Service (USFWS)
- Fort Yuma-Quechan Tribe
- Arizona Department of Transportation (ADOT)
- Arizona Game and Fish Department (AZGFD)
- La Paz County

Several other Federal, state, and local agencies will rely on the information in this EIS to inform their decisions regarding issuance of specific authorizations and permits related to the Project:

- U.S. Department of Defense
- Arizona Department of Environmental Quality (ADEQ)
- Arizona State Historic Preservation Office (SHPO)
- Arizona State Land Department (ASLD)
- Arizona Department of Water Resources (ADWR)
- La Paz County

1.3 Agency Purpose and Need; Decision to be Made

The BLM’s purpose for action is to respond to the Applicant’s application for a ROW grant to construct, own, operate, maintain, and decommission a utility-scale solar PV energy generating facility on public lands administered by the BLM YFO. The need for action is established by the BLM's responsibility under FLPMA and the Energy Policy Act of 2005 to respond to applications that promote grid reliability and renewable energy development and to designate

corridors for electricity transmission and distribution facilities. The Project would be consistent with the BLM's multiple-use mission focusing nationwide on five overall priorities, one of which is encouraging and facilitating renewable energy development—solar, wind, and geothermal—on U.S. public lands.

1.3.1 DECISION TO BE MADE

The BLM Authorized Officer will decide whether to issue a ROW grant to the Applicant for the Project, and if so, the terms and conditions that would apply. The BLM's Colorado River District Manager is the Authorized Officer who will sign the ROD for the Project, using the information and analysis in the EIS.

1.4 Relationship to Policies, Plans, and Programs

1.4.1 BUREAU OF LAND MANAGEMENT LAND USE PLAN CONFORMANCE

1.4.1.1 Yuma Resource Management Plan

This Project is in the YFO planning area and has been designed to conform to the Yuma Resource Management Plan (RMP) (BLM 2010). The Yuma RMP approved five wildlife habitat areas (WHAs) as priority wildlife-related special interest areas, and the Project is within the Palomas Plain WHA. The Yuma RMP contains decisions relevant to the Proposed Action as follows:

Page 1-7:

- If a proposed project or site-specific action does not conform to or achieve consistency with the terms, conditions, and decisions in the approved RMP, the YFO may deny the proposal or prepare an RMP amendment in the form of an Environmental Assessment or EIS.

Pages 2-64 to 2-67:

Desired Future Conditions Common to All WHAs

- WF-030: WHAs promote healthy terrestrial, aquatic, and riparian ecosystems for biological diversity, ecological integrity and sustainability, and social and cultural needs.

- WF-031: Fragmentation of land cover by land use is reduced within WHAs to sustain ecosystem composition, structure, functions, and processes.

- WF-032: Conservation measures for special-status species, priority species, and other at-risk species are emphasized within WHAs while balancing the multiple uses of public lands.

- WF-033: WHAs provide well-distributed habitats and connective corridors for a functional landscape to maintain self-sustaining, complex interacting groups of species or wildlife assemblages.

- WF-034: Additional human-caused disturbance and land cover changes that may cause adverse effects on native and desired non-native fish and wildlife species habitats are limited within WHAs.

Management Actions Common to All WHAs

- WF-035: When impacts within WHAs are unavoidable, allow no net loss or no net impact to occur so that the ecosystem composition, structure, functions, and processes are maintained.

- WF-036: Additional uses in WHAs will be limited to compatible activities and those actions whose impacts could be mitigated to preserve or enhance wildlife values.

- WF-037: Limit developments (for example, livestock facilities, roads, lands actions, mining and minerals) on WHAs to those that are compatible with wildlife habitat.

Page 2-53:

- The Palomas Plain proposed WHA is the largest unfragmented habitat in southwest Arizona for a myriad of wildlife, including bighorn sheep and mule deer. It contains braided channel floodplains and mixed cacti paloverde communities on rocky slopes and bajadas. The large, contiguous, unfragmented habitat is significant to the hunting community. This area is a potential reintroduction area for the endangered Sonoran pronghorn. The Lower Sonoran Field Office proposed an adjacent 265,400-acre area as the Gila Bend Mountains Wildlife Management Area.

Desired Future Conditions Specific to Palomas Plain WHA

- WF-049: The Palomas Plain WHA promotes landscape juxtaposition and connectivity with adjacent planning areas.

- WF-050: the Palomas Plain WHA maintains unfragmented, functional landscapes with well-distributed habitat and connective corridors to support native wildlife populations (including Sonoran pronghorn, mule deer, desert bighorn sheep, desert tortoise, and raptor species).

Management Actions Specific to Palomas Plain WHA

- WF-051: Allocate the Palomas Plain WHA 704,800 acres under Alternatives B and C, and 627,700 acres under the Proposed Plan.

- WF-052: Concentrate developments such as utility facilities in areas already developed or disturbed.

Separate from WHAs, the Yuma RMP contains decisions relevant to the Proposed Action as follows:

Rights-of-Way (Page 2-170):

Desired Future Condition

- LR-027: Public demand for ROWs is met on a case by case basis.

Management Actions

- LR-030: Require all ROW construction activities to follow stipulated rehabilitation measures in support of the planning area's desired plant communities. Stipulations may include imprinting, contouring, debris and brush replacement, and invasive plant treatment. Avoid blading new routes to the greatest extent possible. Where access is needed to accomplish objectives, crush vegetation instead of blading and denuding the ground surface.

- LR-031: To the extent possible, locate new ROWs within or parallel to existing ROWs or ROW Corridors to minimize resource impacts. Locate new major ROWs and utility facilities in designated ROW Corridors, unless an evaluation of the Project demonstrates location outside of a designated corridor is the only practicable alternative.

- VR-014: All ROWs (will) meet visual resource management (VRM) objectives and mitigation measures stipulated in the authorization.

Renewable Energy (Page 2-174)

- The BLM's general policy is to facilitate environmentally responsible commercial development of solar energy projects on public lands and use solar energy systems on the BLM's facilities where feasible. The potential for renewable energy in the planning area is based on environmental, physical, and economic criteria in conjunction with policy directives.

Desired Future Conditions

- LR-049: Public lands within the planning area provide for the production and distribution of renewable energy.

- LR-050: The use of public lands for production of renewable energy is encouraged.

Management Actions

- LR-052: Surface occupancy of renewable energy facilities will not be allowed in special designation areas or Special Cultural Resource Management Areas.

- VR-015: Solar or wind generating facilities will not be allowed in VRM Classes I and II.

1.4.1.2 Approved Resource Management Plan Amendments/Record of Decision for Solar Energy Development in Six Southwestern States, October 2012 (Western Solar Plan)

The Western Solar Plan (BLM 2012) is a Programmatic EIS (PEIS) that the BLM prepared to evaluate development of utility-scale solar energy assets; to establish programs, guidance, and policies; and to amend the BLM's land use plans. The BLM reviewed the Western Solar Plan PEIS and found the information it contains is still reliable. The Western Solar Plan established a comprehensive plan to administer the development of utility-scale solar energy resources on BLM-administered public lands in six southwestern states: Arizona (including the Yuma Field Office), California, Colorado, Nevada, New Mexico, and Utah. The approved plan amendments and ROD identified exclusion areas for utility-scale solar energy ROWs, priority areas for utility-scale solar energy ROWs (called solar energy zones or "SEZs"), and areas potentially available for utility-scale solar energy development outside of exclusion areas and SEZs (called variance areas). The plan amendments require programmatic and SEZ-specific design features for solar energy development on public lands to help provide the most environmentally responsible development and delivery of solar energy.

1.4.1.3 Approved Resource Management Plan Amendments and Record of Decision for the Restoration Design Energy Project (BLM 2013)

The Restoration Design Energy Project (RDEP) (BLM 2013) is a BLM Arizona initiative that further prioritized lands across Arizona that may be suitable for solar and wind energy developments, and that established baseline environmental protection measures for such projects. The RDEP prioritized certain variance lands identified in the Western Solar Plan as Renewable Energy Development Areas (REDAs), and established the Agua Caliente SEZ as the highest solar energy priority area in the Yuma Field Office. The BLM reviewed the RDEP PEIS and found the information is still reliable. All utility-scale solar projects (over 20 MW) proposed on BLM-managed lands within Arizona must conform to the RDEP Appendix B, Design Features, Required Plans, and best management practices (BMPs) (**Appendix C**).

1.4.1.4 Applicable Laws and Regulations

The Project will be reviewed during the NEPA process for compliance with applicable laws, including but not limited to:

- Federal Land Policy and Management Act
- Energy Policy Act
- Energy Act
- Clean Air Act
- Clean Water Act
- Endangered Species Act
- Bald and Golden Eagle Protection Act
- Migratory Bird Treaty Act
- National Historic Preservation Act

1.4.2 PERMITS REQUIRED OR POTENTIALLY REQUIRED

The Project may require various authorizations, permits, reviews, or approvals (**Table 1-1**).

Table 1-1. Summary of Potentially Required Federal, State, and Local Permits and Authorizations

Permit, Approval, or Review	Policy	Regulatory Agency
Right-of-way Grant (Application for Transportation and Utility Systems and Facilities on Federal Lands [SF299])	Federal Land Policy and Management Act	Bureau of Land Management
Antiquities and Cultural Resource Reviews	Antiquities Act of 1906, as amended (54 U.S. Code [USC] 320301–320303) (43 Code of Federal Regulations part 3) Archaeological Resources Protection Act of 1979, as amended (16 USC 470aa–47011) National Historic Preservation Act, as amended (16 USC 470) (36 Code of Federal Regulations part 800)	Bureau of Land Management State Historic Preservation Officer
Paleontological Resources Preservation Act Paleontological Resource Use Permit	Paleontological Resources Preservation Act (16 USC 470aaa–470aaa-11)	Bureau of Land Management
Herbicide Use Permit	Bureau of Land Management Authorization for Herbicide Applications on Federal Lands	Bureau of Land Management Arizona Department of Environmental Quality, Arizona Division of Water Quality Arizona Pollutant Discharge Elimination System Program
Air Quality Permit to Construct Air Quality Permit to Operate	Clean Air Act	Arizona Department of Environmental Quality
Construction Stormwater Permit	Arizona Department of Environmental Quality, Surface Water Monitoring and Assessment Program	Arizona Department of Environmental Quality
Notice of Intent (NOI) to Drill, Deepen, Replace or Modify a Well (DWR 55-40), Well Driller Report and Log (form DWR 55-55) and Well Abandonment Completion Report (form DWR 55-58)	Arizona Administrative Code, Title 12, Chapter 15, Article 8	Arizona Department of Water Resources and Bureau of Land Management
Land Use Construction Permit for access road crossing of Central Arizona Project aqueduct	Construction on or in land administered by the Bureau of Reclamation	Bureau of Reclamation, Central Arizona Water Conservation District

Permit, Approval, or Review	Policy	Regulatory Agency
Approval of Spill Prevention, Control, and Countermeasure Plans	Clean Water Act (33 USC 1321) (40 Code of Federal Regulations part 112)	Environmental Protection Agency
La Paz County Land Use and Development Permits and Authorizations	La Paz County Rules and Regulations	La Paz County
Section 7(a)(2) consultation process for threatened or endangered species	Endangered Species Act of 1973 (16 U.S. Code 1536)	U.S. Fish and Wildlife Service
Migratory birds	Migratory Bird Treaty Act of 1918, as amended (16 USC 703-712) Executive Order 13186	U.S. Fish and Wildlife Service
Eagle Incidental Take Permit	Bald and Golden Eagle Protection Act of 1940 (16 USC 668-668d)	U.S. Fish and Wildlife Service
Section 404 Permit and Section 401 Water Quality Certification	Clean Water Act (33 USC 1341, 1344)	U.S. Army Corps of Engineers Arizona Department of Environmental Quality

1.5 Tribal Nation Consultation and Coordination

BLM has initiated government-to-government consultation with Tribal Nations having jurisdiction over or interest in the Project, and consultation is ongoing. As of January 2024, NHPA Section 106 consultation letters and scoping invitation letters had been mailed to the following 16 Tribal Nations:

- Ak-Chin
- Chemehuevi Indian Tribe
- Cocopah Indian Tribe
- Colorado River Indian Tribes
- Fort McDowell Yavapai Nation
- Fort Mojave Indian Tribe
- Fort Yuma-Quechan Tribe
- Gila River Indian Community
- Hopi Tribe of Arizona
- Mescalero Apache
- Moapa
- Pueblo of Zuni
- Salt River Pima-Maricopa Indian Community
- Tohono O'odham Nation
- Yavapai-Apache Nation
- Yavapai-Prescott Indian Tribe

1.6 Scoping and Public Involvement

A notice of intent (NOI) to prepare an EIS, initiating the formal 30-day scoping period and a two-year segregation of minerals, was published in the Federal Register on December 7, 2022. A public scoping letter was sent to the parties on the Proposed Action's mailing list at the same time as the publication of the NOI. Press releases to notify the public of the BLM's intention to prepare an EIS were published in the *Yuma Sun* and *Parker Pioneer* on January 4, 2023. The press releases also announced the public meetings and described how to submit comments.

1.6.1 SCOPING MEETINGS

Two public scoping meetings were held: an in-person scoping meeting on January 11, 2023, in Tonopah, Arizona, and a virtual public scoping meeting on January 17, 2023. Five people attended the Tonopah meeting, and 26 people attended the virtual meeting. Additional information on scoping including the notices, advertisements, meeting presentations, and comments received can be found in the Jove Solar Project Scoping Report, available on the Jove Solar Project Website.

A mailing list of interested and potentially affected individuals, groups, and agencies, including a Proposed Action proximity list to include private landowners near the Project, was developed and updated throughout the Project scoping process. The mailing list included elected officials, government and regulatory agencies, Tribal Nations, community and environmental organizations, private parties, and other interested stakeholders.

1.7 Issues Identified during Scoping

During scoping, several issues were raised. The BLM resource specialists developed the following questions to inform the analysis in this EIS.

1.7.1 AIR QUALITY/GREENHOUSE GAS/CLIMATE CHANGE

How would construction, operation, and reclamation of the Project impact air quality and visibility?

1.7.2 BIOLOGICAL RESOURCES

How would construction, operation, and decommissioning activities affect habitat availability and fragmentation for wildlife, including migratory and resident birds and BLM sensitive species like the Sonoran Desert tortoise (*Gopherus morafkai*) and the Sonoran pronghorn (*Antilocapra americana sonoriensis*)?

Would construction, operation, and decommissioning activities exclude wildlife, including migratory and resident birds and BLM sensitive species like the Sonoran Desert tortoise (*Gopherus morafkai*) and the Sonoran pronghorn (*Antilocapra americana sonoriensis*), from its habitat?

How would increases in Project-related traffic increase the risk for direct mortality of Sonoran Desert tortoise?

How would ground-disturbing activities increase the risk for establishment and spread of non-native or noxious plant species; and how would those changes in non-native plants affect quality and quantity of existing habitat for wildlife, BLM sensitive species, including Sonoran Desert tortoise and Sonoran pronghorn, threatened and endangered (T/E) species, and migratory and resident birds?

How would construction and operation activities affect migratory and resident bird nesting and mortality?

1.7.3 CULTURAL RESOURCES

How would vegetation removal impact cultural resources?

How would the cutting of brush disturb the distribution of cultural sites?

How would subsurface modifications affect buried cultural resources?

How would overland travel of various vehicles impact the cultural resources within the area of potential effect?

How would geotechnical excavation, such as boring, affect any possible subsurface cultural resources?

How would the backfilling of soils from various excavations affect the location and context of cultural resources?

How would security fencing installed around the solar array impact cultural resources?

In the long term, how would cleared areas that are routinely used for operational ground maintenance and ongoing maintenance of access roads affect the presence and context of cultural resources?

During the maintenance and operation of the solar array, what are the potential impacts of increased human presence on cultural resources?

1.7.4 ENVIRONMENTAL JUSTICE/SOCIOECONOMICS

How would the Project affect environmental justice communities, and would these effects be disproportionately adverse?

1.7.5 FUELS AND FIRE MANAGEMENT

How would construction, operation, and decommissioning activities affect the risk of human- or natural-caused wildfire ignition?

1.7.6 LIVESTOCK GRAZING

How would construction, operation, and decommissioning activities affect grazable acres and stocking rates within the affected allotments?

How would construction, operation, and decommissioning activities affect access to water and grazing lands for the grazing permittee and their livestock?

1.7.7 NATIVE AMERICAN, RELIGIOUS, TRADITIONAL

How would removal of vegetation impact the Tribal Nations' use of the resources, their access to those resources, and their qualities?

How would earthwork, such as grading and excavations, affect the resources that Tribal Nations historically have used within the area?

How would discrete excavations, like boring or driving panel-mounting posts, affect the Tribal Nations' resources in the subsurface?

How would surrounding the facility with security fencing change the Tribal Nations' access to resources?

1.7.8 RECREATION

Which, if any, existing recreation opportunities within or around the Project site would the Project temporarily or permanently conflict with or preclude?

Would human presence or noise during construction activities impact the quality of hunting opportunities near the Project site?

How would Project construction and permanent infrastructure, such as fencing, towers, and guy wires, impact off-highway vehicle (OHV) use?

Would the BLM's potential authorization of the Project ROW affect existing access to the Eagletail Mountains Wilderness?

1.7.9 SOIL RESOURCES

How would preconstruction and construction, operation, decommissioning, and restoration activities affect soil stability, health, and productivity?

How would importing non-native soils affect soil quality and the ability to host native plants?

1.7.10 VEGETATION

How would construction, operation, and decommissioning activities affect populations and distribution of special-status plant species (that is, T/E species, BLM sensitive species, and Arizona protected native plants)?

How would construction, operation, and decommissioning activities affect vegetative cover, erosion, and watershed health?

1.7.11 VISUAL RESOURCES

How would construction, operation, and decommissioning activities contrast with the Project area's existing scenic quality?

How would the Project meet (or not meet) the objectives of the BLM's VRM Class III classification for the Project site?

How would construction and operation of the Project and past, present, and reasonably foreseeable future actions cumulatively impact scenic quality and light and glare?

How would lighting from construction and operation of the Project impact dark skies and star gazing?

How would glare from operation of the Project impact views from key observation points (KOPs)?

1.7.12 WASTE/HAZARDOUS WASTE

What are the risks of leaks and spills during construction, operation, and decommissioning?

1.7.13 WATER

How would groundwater quantity be affected by proposed withdrawals for dust control and array watering?

How would surface hydrology change as a result of the Project?

What would the impacts be from stormwater discharge during construction, operation, and decommissioning?

How would construction, operation, maintenance, and decommissioning of the Project impact floodplain ability to transmit flow?

How would the construction, operation, and decommissioning of the Project impact groundwater resources and springs?

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2 Proposed Action and Alternatives

2.1 Introduction

This chapter presents three alternatives: the No Action Alternative, the Proposed Action, and the Wash Avoidance Alternative.

2.2 Alternatives Development

Scoping identified issues to be analyzed in this EIS, and a range of alternatives were considered to address these issues. Scoping also generated suggestions for ways to reduce potential impacts. Several modifications to the Applicant's original proposal to reduce potential adverse effects were suggested; the Applicant readily accepted these modifications and the Proposed Action described below reflects the incorporation of these measures (**Section 2.4**). The Wash Avoidance Alternative was proposed in response to input from cooperating agencies and would reduce potential adverse effects on the environment in comparison to the Proposed Action, while still meeting the purpose and need (**Section 2.5**). Alternatives that did not meet these criteria were eliminated from detailed analysis (**Section 2.8**).

2.3 No Action Alternative

Under the No Action Alternative, BLM would not approve the ROW grant on BLM-administered public lands, and the Project would not be constructed on BLM-administered lands. The area would remain open for authorized activities such as grazing, dispersed recreation, and other uses, including other ROW applications. The No Action Alternative forms the baseline against which the potential effects of the Proposed Action and Action Alternatives are compared.

2.4 Proposed Action

The Project would be constructed on 3,495 acres of public lands administered by BLM and 38 acres administered by La Paz County in southeastern La Paz County, Arizona, about 85 miles west of Phoenix, 30 miles west of the community of Tonopah, and—at the closest—approximately 1.5 miles south of Interstate 10 (I-10) (**Figure 2-1**). The Project received approval in 2021 to be located within a variance area identified through the Western Solar Plan (BLM 2012). All utility-scale solar projects (over 20 MW) proposed on BLM-managed lands within Arizona must conform to the BLM RDEP Appendix B, Design Features, Required Plans, and best management practices (BMPs) (**Appendix C**).

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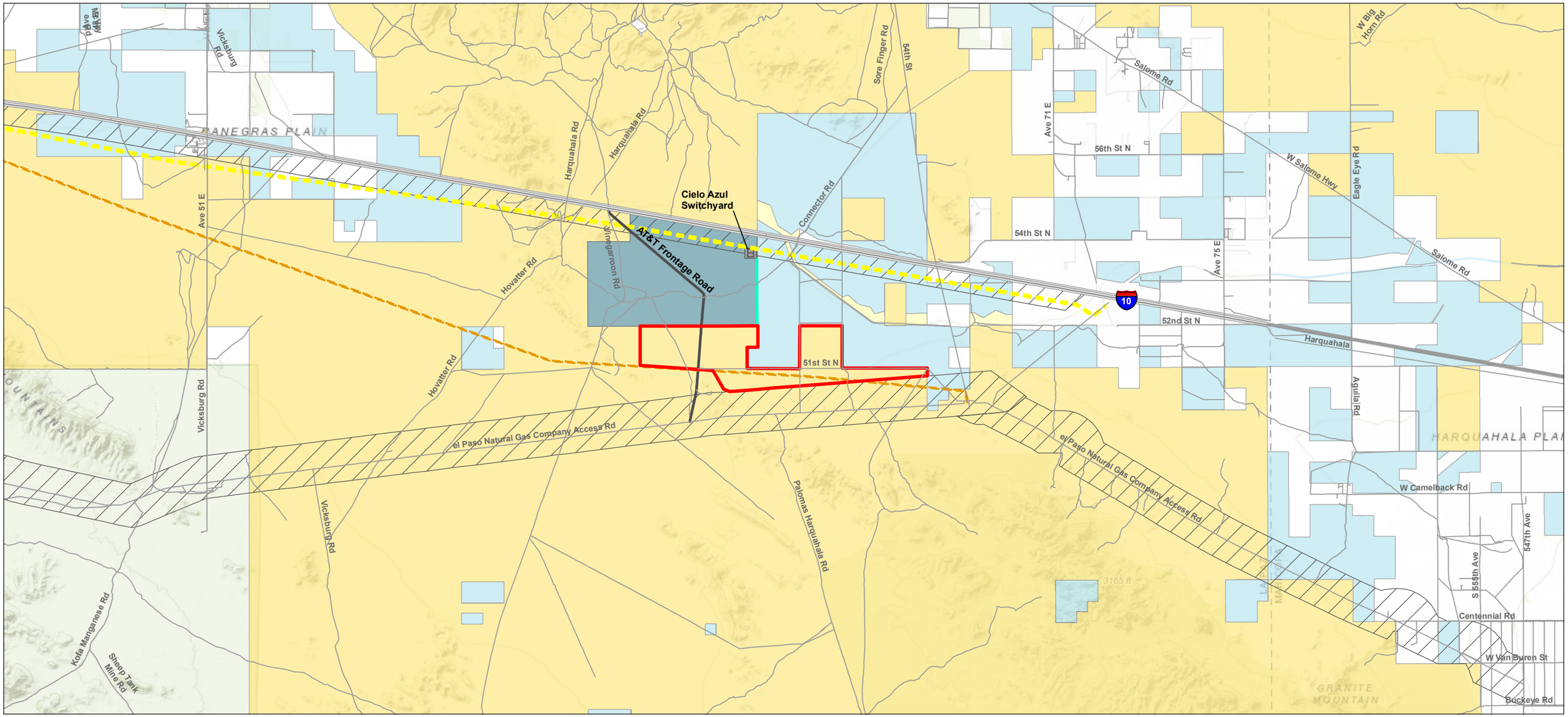

Notes

1. Coordinate System: NAD 1983 StatePlane Arizona West FIPS 0203 Feet
2. Data Sources: CalTrans, Stantec, 2021
3. Background: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Figure 2-1
Jove Solar Project Vicinity

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The Project would have a net generating capacity of up to 600 megawatts alternating current (MWac) and an installed solar nameplate rating of up to 750 MW peak. The Project would include solar PV modules, DC cabling and combining switchgear, PCSs, voltage collection systems, transformers, monitoring and controls systems, operation and maintenance facilities, aboveground electrical connection lines, and potentially a BESS and substation. The Project would also use a substation on a planned and approved solar facility which would connect into the regional transmission system via the Cielo Azul 500 kV switching station and Ten West Link 500 kV transmission line (construction underway). Overhead 69 kV connection lines would extend approximately 1.7 miles in a utility easement already secured on La Paz County land to the Cielo Azul switching station (**Figure 2-2**). The Project would be enclosed within a security fence.

2.4.1 DESIGN FEATURES

Design features are means, measures, or practices that are intended to avoid or reduce adverse environmental impacts and are incorporated into a Proposed Action and Action Alternatives. Design features may be derived from programmatic documents that guide development on lands available for renewable energy, from the Yuma RMP, from the BLM or cooperating agencies, or from the Applicant.

The BLM has required the Applicant to incorporate numerous design features into the Proposed Action to reduce adverse environmental effects. The RDEP (BLM 2013) included a suite of design features specific to Arizona that establish the minimum specifications for managing individual renewable energy projects and mitigating adverse impacts (see Appendix B of the RDEP, Design Features, Required Plans, and BMPs provided in **Appendix C**). The design features are presented by resource topic and Project phase (for example, siting and design, site characterization, construction, operations, and decommissioning). Many of the design features indicate the need for project-specific plans and studies. The content and applicability of these plans depend on specific project requirements and locations; however, the design features provide some guidance of what to include in specific plans. The authorizing officer will determine the adequacy of such plans before approving a project.

Design features are considered part of a Proposed Action and Action Alternatives; accordingly, the environmental consequences (**Chapter 3**) discusses the impacts remaining after application of design features. If additional measures could further reduce specific resource impacts, those mitigation measures are presented in Chapter 3 along with discussion of how the mitigation measures would reduce impacts. The BLM Authorized Officer will specify in the ROD which, if any, of the proposed mitigation measures would be required for the Project, if approved.

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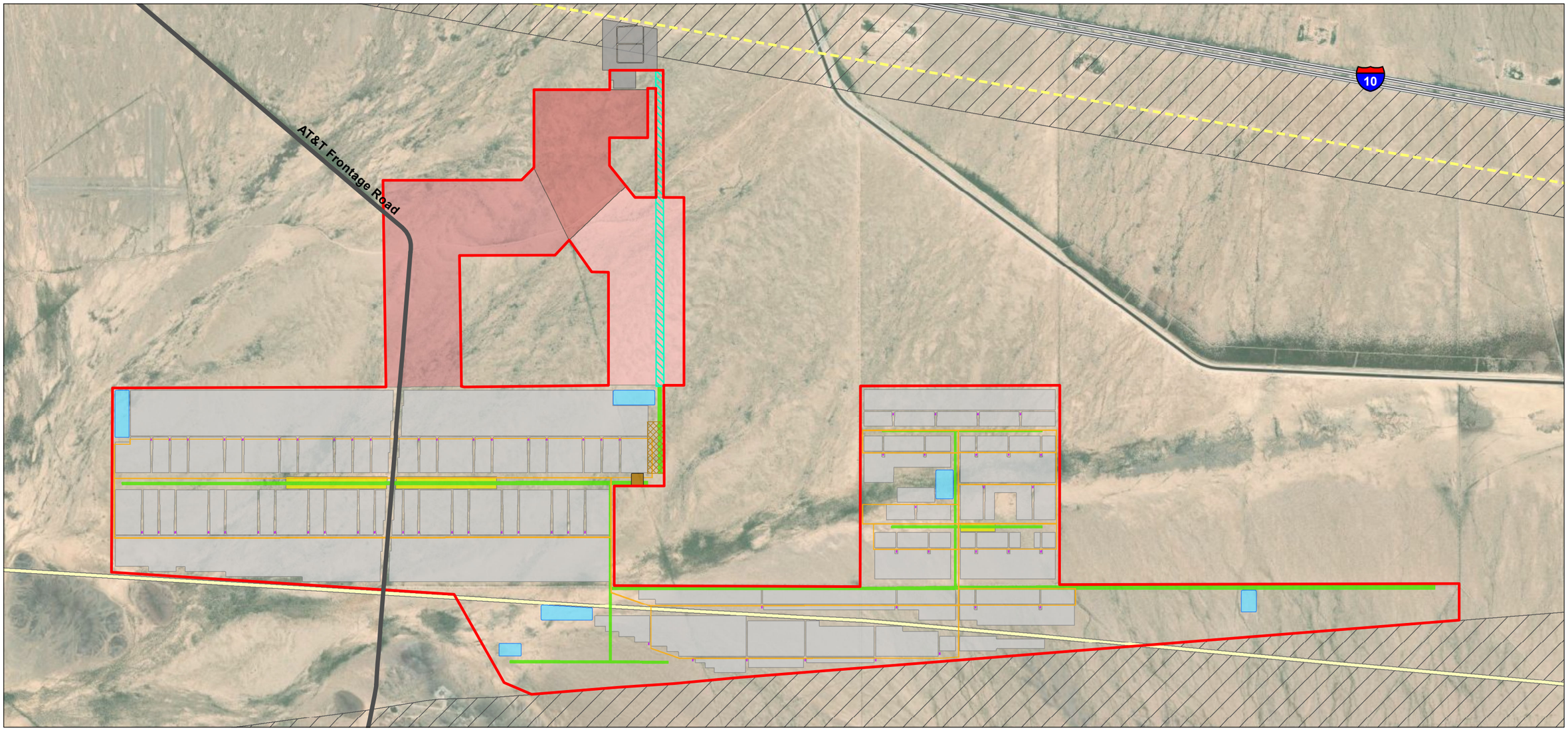

- Project Site
- Array Area
- Laydown Yard
- Approved Cielo Azul Switchyard and Substation
- Proposed Access Road
- Equipment Access Road and High Voltage Overhead Line Electrical Collection Corridor System
- Potential Battery Energy Storage System
- Stormwater Feature
- PV Inverter
- O&M Building and Parking
- Existing Pipeline Setback
- Ten West Link Transmission Line (Planned)
- Proposed Electrical Connection Corridor in Utility Easement
- BLM Utility Corridor
- AT&T Frontage Road
- U.S. Interstate Highway 10

Sub-alternative Gen-tie Corridors

- Option 1
- Option 2
- Options 1 and 2

* Notes
1. Corridors are located entirely on La Paz County land.
2. Corridors show a wider area than the nominal 200-foot width, if selected.

N

0 0.25 0.5 1 Miles

1:32,000 (At original document size of 11" x 17")

NATIONAL SYSTEM OF PUBLIC LANDS
U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Figure 2-2
Preliminary Site Plan
Proposed Action

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The Applicant would develop plans and procedures that avoid or minimize impacts to the environment during construction, operation, and decommissioning. These plans and procedures are summarized below and will be provided as appendices to the EIS as applicable or posted on the Project's ePlanning page. The Applicant has reviewed and incorporated into the Project design features from the following sources:

- BLM (2010) YFO RMP Appendix B: Best Management Practices
- BLM (2012) Western Solar Plan
- BLM (2013) Restoration Design Energy Project Appendix B: Design Features, Required Plans, and BMPs (**Appendix C**)
- Applicant's Construction, Operations, and Maintenance Plan

Design features developed for the Proposed Action follow. Plans denoted by an asterisk (*) are required by the RDEP Appendix B (**Appendix C**), Table B-1 (Design Features) or Table B-2 (Required Plans).

2.4.1.1 Health and Safety Program*

Prior to the start of construction, the Applicant would conduct a safety assessment to identify potential safety issues and develop measures that would be employed to mitigate them. A health and safety program would be developed to protect both workers and the public during Project construction.

2.4.1.2 Site Safety and Security

The Project would post warning signs along the Project access roads informing the public of construction activities and informing the public not to trespass onto the site. For areas where public safety risks could exist and site personnel would not be available to control public access to excavated foundation holes and electrical distribution system trenches (for example, during evenings and holidays), warning signs and temporary fences or flagging would be erected. Temporary fencing may also be installed around material storage, staging, and laydown areas. Other areas determined to be hazardous or where issues of security or theft are of concern may be fenced in coordination with the BLM. Temporary fencing around unfinished excavations and other potential hazards typically would consist of a high-visibility plastic mesh or red/yellow danger tape. The Applicant may also use security guards, cameras, and/or additional fencing, if necessary, to protect public health and safety and the Project facilities.

Site safety procedures address a zero-injury safety policy, responsibilities and roles of personnel, health and safety for subcontractors, worker safety orientation and training, severe weather conditions, and accident/incident reporting procedures. The site safety procedures also outline employee safe work programs, including drug and alcohol policies, hazardous materials, fire protection, respirator use and maintenance, confined workspaces, and potential work hazards such as blood-borne pathogens, electrical hazards, and environmental dangers.

2.4.1.3 Emergency Response*

Emergency response procedures would include emergency recognition and prevention, organization and personnel responsibilities, emergency alerting procedures, maps and diagrams of the facilities, incident documentation, investigation responsibilities, and post-emergency

activities. Specific emergency response procedures for medical emergencies, severe weather, power outages, and other situations would also be addressed.

2.4.1.4 Fire Management and Protection Plan*

The fire prevention and suppression procedures would address potential fire sources and appropriate safety and fire prevention measures. Project-specific potential fire prevention and suppression procedures include vehicle exhaust systems, fueling operations, smoking, electrical work, and on-site flammable liquid storage. Fire suppression, emergency preparedness, and emergency notification and follow-up procedures are also addressed; and BLM fire guidelines for equipment use and other measures, such as carrying fire extinguishers and shovels, are incorporated into the procedures.

2.4.1.5 Transportation Management Plan*

Traffic management procedures would be designed to minimize potential hazards from increased truck and worker traffic and to minimize impacts to traffic flow in the vicinity of the Project. The procedures would present Project-specific information on traffic and circulation in the Project area, truck traffic volumes, traffic situations, areas of congestion, special traffic concerns, such as the locations of school bus routes, and specific traffic management measures, including informational signs, flaggers when equipment blocks throughways, and traffic cones to identify any temporary changes in lane configuration.

Transportation procedures would address issues specific to transporting Project components and construction equipment, such as trucks, loaders, various-sized bulldozers, shovels and backhoes, welding rigs, generators, and compressors. Equipment and material hauling would be performed in a manner that prevents damage to areas outside of the Project area and to minimize interference with existing uses of lands crossed.

The transportation procedures would describe regional and local access routes and affected roadways, traffic volumes, pavement conditions, and traffic mitigation measures. The procedures describe travel routes for construction materials, current and predicted traffic volumes for construction access routes, and BMPs for handling traffic along these transit routes during Project construction. The procedures also identify the processes for complying with state requirements.

2.4.1.6 Wildlife Monitoring Plan and Wildlife Mortality

The Wildlife Monitoring Plan would be developed in coordination with the BLM, AZGFD, and USFWS and would include the following measures to minimize potential effects to wildlife and habitat:

- Develop and implement preconstruction nesting bird surveys to avoid or minimize impacts during the breeding season. See that activities are restricted around active nests using buffers consistent with BLM and AZGFD guidelines.

- Where fencing is required, install wildlife-friendly fencing specific to diverse types of wildlife to achieve permeability across sites. Specifically, fencing with larger holes to allow small and medium species to pass through.

- Preserve 500-foot buffers on either side of the centerline of the desert wash that crosses Section 32, within a 50-meter buffer of locations of known environmental sensitivity, and further west along the wash where it passes through and parallels the Project (**Figure 2-3).**

- Collect systematic monitoring data on injuries and mortalities of birds and other wildlife during the first three years of Project operations to quantify bird and bat mortalities, including quantifying the scale of impacts and which taxonomic groups are being impacted:

    - Mortality monitoring will follow the established protocol developed by USFWS and U.S. Geological Survey.

    - A qualified biologist approved by the BLM will conduct regular, systematic, and quantifiable (including statistically supportable estimates of detection probabilities) mortality searches following the established protocol developed by USFWS and USGS.

    - Annual Mortality Reports will be prepared for the first three years of monitoring and include incidental mortality observations.

    - At the conclusion of three years, BLM will re-assess operational mortalities and the need for continued or modified monitoring.

- Have an injured wildlife response plan available (for example, name and contact information for licensed wildlife rescue/rehabilitation).

- Develop a wildlife reporting system to document incidental observations of bird or wildlife injury or mortality detected opportunistically (that is, not as part of regular surveys) for construction and the first three years of operation.

- Seek confirmation of species identifications where needed for all injuries and mortalities for construction and the first three years of operation.

- Self-report all mortalities of birds and other wildlife from systematic sampling and incidental observations to AZGFD and USFWS at the time of detection.

- Use downcast/shielded motion or infrared lighting during construction and operation and maintenance to minimize nighttime lighting impacts to birds, bats, and other wildlife per USFWS guidelines (Threats to Birds: Collisions - Nighttime Lighting).

- Avoid creating potential predator subsidies, including food, garbage, pooled water, and predator roosting/nesting sites and shelter.

2.4.1.7 Decommissioning and Site Reclamation Plan*

The Project would be decommissioned, and the land would be reclaimed in a manner that meets or exceeds applicable industry standards and regulatory requirements.

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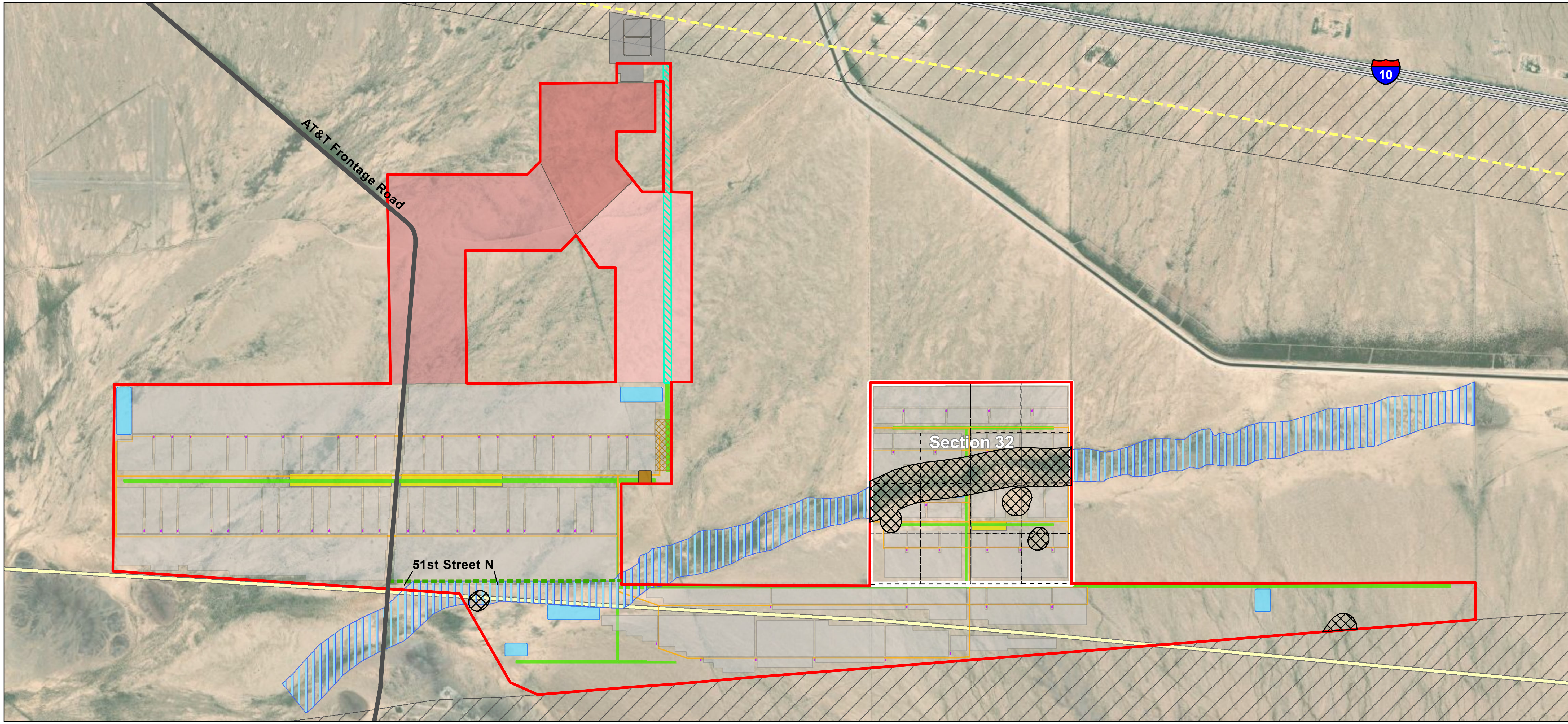

Project Site
No-Build Area
Wash
Section 32 Quarter-quarters
Wash Avoidance Alternative Fencing
Array Area
Laydown Yard
Approved Cielo Azul Switchyard and Substation
Proposed Access Road
Equipment Access Road and High Voltage Overhead Line Electrical Collection Corridor System
Potential Battery Energy Storage System
Stormwater Feature
PV Inverter
O&M Building and Parking
Existing Pipeline Setback
Ten West Link Transmission Line (Planned)
Proposed Electrical Connection Corridor in Utility Easement
BLM Utility Corridor
AT&T Frontage Road
U.S. Interstate Highway 10

Sub-alternative Gen-tie Corridors *

Option 1
Option 2
Options 1 and 2

* Notes
1. Corridors are located entirely on La Paz County land.
2. Corridors show a wider area than the nominal 200-foot width, if selected.

N

0 0.25 0.5 1 Miles
1:32,000 (At original document size of 11" x 17")

Figure 2-3
Preliminary Site Plan
Wash Avoidance Alternative

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2.4.1.8 Hazardous Materials and Waste Management Plan*

Applicant would address selection, transportation, storage, and use of all hazardous materials needed for construction, operation, and decommissioning of the facility for local emergency response services, public safety authorities, and the regulating agency, and would also address the characterization, on-site storage, recycling, and disposal of all resulting wastes. This plan would outline specific preventive measures to be followed to reduce the likelihood of an accidental release of a hazardous or regulated materials during construction activities.

The plan would restrict the location of fuel storage, refueling activities, and construction equipment maintenance within the facility. The plan would also include procedures, materials, and lines of communication to facilitate the prevention, containment, and cleanup of spills during construction activities. It also sets forth minimum standards for handling and storing regulated substances. The goal of the plan would be to minimize and contain the potential for a spill of these materials and to provide other prompt response measures for any spills that may occur.

2.4.1.9 Stormwater Pollution Prevention Plan*

A stormwater pollution prevention plan (SWPPP) identifies potential sources of pollution that would reasonably be expected to affect the quality of stormwater discharges from construction of the Project. The SWPPP would be prepared in coordination with the ADEQ, and would describe the implementation of mitigation or protection measures that would be used to reduce the pollutants in stormwater discharges associated with construction activity at the construction site.

2.4.1.10 Unanticipated Discoveries Plan (Cultural and Paleontological Resources)*

The Applicant would develop an unanticipated discovery plan to provide procedures if unknown cultural resources, human remains, or paleontological resources are encountered during construction. The plan would specify procedures for handling such discoveries in an efficient and legally compliant manner.

2.4.1.11 Habitat Restoration and Integrated Weed Management Plan*

The Applicant would develop a habitat restoration and integrated weed management plan to prevent the introduction and spread of undesirable plants into the Project area. Temporary and final reclamation efforts would use certified weed-free seed approved by the BLM to prevent the spread of primary noxious and invasive weeds. The proposed BLM-approved native seed mix would be composed of species found in the area that would help reestablish the existing vegetative cover for the plant communities located within the site.

After construction, vegetation control may be necessary and would include monitoring and controlling noxious and invasive weeds in and adjacent to all disturbed areas. Vegetation control would consist of manual, mechanical, biological, or chemical methods. If herbicides are used on the site, their application would be conducted according to the BLM's policies and procedures.

2.4.1.12 Preconstruction Biological Surveys

Qualified biologists would conduct preconstruction surveys for sensitive species. Sensitive resources areas would be flagged so that they are avoided or appropriately managed during construction. The survey area for biological resources would be the Project area plus appropriate

buffers around the electrical connection line corridors, the proposed switchyard, and the access roads (depending on the species/resource).

2.4.1.13 Additional Design Features

The Applicant has committed to developing, constructing, and operating the Project with the following goals:

- Protect existing conservation areas and habitat connectivity corridors.
- Preserve existing values as much as feasible, or reduce impacts on visual and cultural resources, and water quality and availability.
- Preserve the function and habitat at a landscape level across the Project.
- Identify and include design features that can be consistently and transparently applied to future projects.
- Maintain local air quality, water availability, and wildlife habitat to compensate for potential impacts to sensitive resources (for example, sensitive species habitat, washes, woodlands).
- Use modeling techniques to assess the cumulative impacts on visual and cultural resources.

2.5 Wash Avoidance Alternative

The Wash Avoidance Alternative is largely the same as the Proposed Action but would avoid construction within the desert wash (an intermittent drainage) that crosses the Project generally from west–southwest to east–northeast. This Action Alternative would preserve the channel floodplain and its vegetation, and would maintain connectivity of comparatively high-value wildlife habitat and would avoid three known areas of environmental sensitivity. Collectively, these avoidance areas are referred to as the "no-build" area.

Under the Wash Avoidance Alternative, Project components such as solar arrays, stormwater features, buildings, et cetera, would not be constructed within 500 feet of either side of the centerline of the desert wash that crosses Section 32 (145.8 acres), within a 50-meter buffer of locations of known environmental sensitivity, and further west along the wash where it passes through and parallels the Project (**Figure 2-3**). The Project could build elsewhere within Section 32. If the Applicant opts to install solar arrays or other Project components north of the no-build area in Section 32, and these components require cabling to collect energy and connect to other Project components south of the no-build area, overhead or underground cables could be used to cross the no-build area.

The Applicant would allow the natural westward extension of the desert wash to be unimpeded by incorporating the continuation of the desert wash west of the Project into fencing plans that parallel 51st Street. Project fences that parallel 51st Street N would have openings for the desert wash.

This Action Alternative is recognized to have similar impacts on the various resources analyzed herein, but owing to avoidance of the no-build area, such impacts would be reduced in scale or extent as compared with the Proposed Action.

2.5.1 WASH AVOIDANCE ALTERNATIVE DESIGN FEATURES

The Wash Avoidance Alternative would include all design features listed above for the Proposed Action (**Section 2.4.1**) and would impose the following additional design features.

2.5.1.1 Air Quality

- Limit vehicle idling on-site to two minutes for off-road equipment.
- Check that construction best practices acknowledge the importance of dust abatement for protection of vegetation, worker safety, and air quality.

2.5.1.2 Wildlife Mortality

- Install avian collision avoidance features and fence reflectors (for example, bird flight diverters with Firefly™ reflectors) on 69 kV lines, or bury all collector lines.

2.5.1.3 Soil and Vegetation

- Overland travel and vegetation crushing with spot trimming only where needed would be the primary means of site preparation within the array, instead of high-impact site preparation techniques like disk and roll or grading.

2.6 Sub-alternatives to the Action Alternatives

The Applicant has proposed two "sub-alternative" routes on La Paz County land for the approximately 1.5-mile-long 69kV gen-tie transmission lines, within the 200-foot-wide utility corridor that would connect the Project to the Atlas Project Substation at Cielo Azul via overhead lines, Option 1 and Option 2 (**Figures 2-2** and **2-3**). Note that the corridors shown (**Figures 2-2** and **2-3**) are much wider than the 200-foot width that would be required, to allow for siting flexibility.

Option 1 would exit the Jove Solar Project to the north along the same 200-foot wide utility corridor shown for the Proposed Action (**Figure 2-2**) before turning generally northwest, then again turning north, parallel to and on the west side of the area proposed for the Atlas Project BESS, then turning east to enter the Cielo Azul Substation on the north side of the BESS. Option 2 would exit the Jove Solar Project farther west of Option 1 and would proceed north before turning northeast to join a northbound segment common to Option 1, and from there would follow a similar path to Option 1.

2.7 Action Alternatives: Proposed Facilities

The Project location, construction methods, general elements and features, operation and maintenance, decommissioning, and basic details remain the same for both Action Alternatives.

2.7.1 SOLAR ARRAYS

The proposed solar facility would primarily consist of solar arrays that would generate electricity directly from sunlight. A solar array is a row of individual PV modules electrically connected and supported by a common supporting tracking structure. The Project would install up to 1.2 million solar modules for a potential capacity of approximately 600 MWac power. The top edge of each PV module would not exceed 16 feet above grade when the modules are at maximum tilt. The PV modules would be mounted on single-axis trackers and rotate to track the sun's movement throughout the day. The trackers would be powered by motors and would be directed by an actuator that responds to the sun's direction. The use of trackers would increase electricity production between 15 and 20 percent as compared with PV modules at a fixed angle (**Figure 2-4**).

The tracking structures would be anchored into the ground by steel posts that would be driven to a depth of up to 10 feet, depending on the structural loads and geotechnical conditions, using a vibratory ram or other specialized equipment. No concrete footings would be anticipated for the solar arrays.

Figure 2-4. Typical PV Module Tracking Structure

2.7.2 BATTERY ENERGY STORAGE SYSTEM

The Project would potentially incorporate a BESS capable of storing up to 1,200 MWh of electricity. If included, it would be constructed at the same time as the Project; thus, this EIS considers potential effects of constructing a BESS alongside other effects of the Project in **Chapter 3**. The BESS would comprise a 12-acre BESS yard containing two single-story rectangular buildings up to 500 feet x 200 feet (100,000 square feet), each with a maximum height of up to 24 feet. The BESS would be located on concrete slab foundations and include outdoor PCS inverters and step-up transformers to convert the electricity from DC to alternating current. The BESS yard would be located near the south end of the electrical connection corridor, adjacent to the proposed substation. The system would also incorporate ventilation fans

and cooling systems, which emit low levels of noise. The BESS would incorporate a fire detection and direct injection fire suppression system.

2.7.3 POWER CONVERSION STATIONS (PCS)

Approximately 120 PCSs would be distributed throughout the PV arrays. These stations would include inverters, step-up transformers, and ancillary electrical, protection, and control equipment to convert DC electricity produced by PV modules to AC electricity, which is typically 34.5 kV. The PCSs may be prefabricated off-site on metal or concrete skids (platforms), along with the associated electrical panels, enclosures, and other equipment necessary for operation (**Figure 2-5**).

Figure 2-5. Typical Inverter Station

2.7.4 ELECTRICAL COLLECTION AND DELIVERY SYSTEM

Each PCS would transform the generated power to medium voltage for delivery via the proposed connection lines to the Cielo Azul switchyard. Transformers may be dry type or liquid dielectric, free of polychlorinated biphenyls (PCBs). The dielectric fluid would be either natural ester derived from renewable vegetable oils, synthetic ester, or mineral oil.

Each PCS would be connected via electrical switchgear to an electrical collection system, which would deliver the energy to combining switchgear. The electrical collection system would be installed in accordance with the National Electrical Code, either with underground cables housed in metal conduits in trenches typically 36 to 48 inches deep or as overhead circuits on wooden utility poles typically 40 feet high. Fiber-optic communications networks would also be run underground, generally in the same trenches as the electrical collection system.

2.7.5 METEOROLOGICAL SYSTEM

Up to 12 meteorological stations would be installed within the interior of the Project, to accurately measure conditions within the solar arrays. The meteorological stations would be connected to the supervisory control and data acquisition (SCADA) system (described further in **Section 2.7.11.3**) to collect data for analysis and system monitoring. The meteorological station instruments would be mounted on a tubular steel tower, 10–15 feet high, with guy wires and a

small concrete foundation (**Figure 2-6**). Alternative designs that do not require concrete foundations may be considered.

Figure 2-6. Typical Meteorological Station

2.7.6 ACCESS ROADS AND CONNECTOR ROADS

Primary construction and operational traffic to the Project would come from the I-10/Hovatter Road interchange, travel across BLM-administered land approximately 0.3 mile on Hovatter Road to AT&T Frontage Road, then proceed approximately 2.8 miles on AT&T Frontage Road across BLM-administered land, and continue 3.8 miles on La Paz County land. Hovatter and AT&T Frontage Roads are maintained by La Paz County. The requested ROW grant on these roads through BLM-administered land is 24 feet. Gravel would be added to Hovatter and AT&T Frontage Roads to support construction traffic. Existing public roads would remain open to the public. New roads would be constructed within the Project area along electrical collector line corridors to support Project construction and operation.

Access roads within the Project area would be improved as needed to accommodate construction vehicles and equipment and would have a permanent travel width of 20–25 feet within a gravel road base to a depth of 3–4 inches, with a 2-foot-wide shoulder on each side. The roads would otherwise consist of a compacted native surface road. These access roads would be used during construction to facilitate delivery of components, installation, and wiring, and for scheduled (for example, panel washing) and unscheduled (for example, repairs) maintenance access during operations. All public roads outside of the solar facility would remain dedicated public access,

but fencing would be placed along the public roads to prevent unauthorized access to the facility. A buffer between the road and the fence would be included in consultation with the AZGFD.

Permanent access roads along the electrical connection lines would not be traveled more than once per year and only for inspection and possible cleaning or repair. Therefore, the grounds below the electrical connection lines would not be substantially altered from their current conditions. Minimal grading would occur to remove any localized impediments for passage by 4-wheel drive utility service trucks. There would be no alteration of existing major grades. However, widening to 24 feet and installation of road base or gravel on 51st Street where it passes through the Project would be required.

The general road design criteria for the perimeter road and access roads to facilities would include the following specifications:

- Travel width of 20–25 feet with 2-foot-wide shoulders sloped to match existing grades
- Approximately 25-foot radius at road centerline
- Approximately 35-foot radius at road corners
- Compacted native surface or road base with gravel surface, approximately 3–4 inches thick, placed over landscape cloth or other porous material
- Design speed of 20 miles per hour

There would not be any access roads down the length of the proposed utility easement. If access roads would cross existing underground utilities, the crossing sites would be designed to be protective of the underground utilities.

Access road construction would begin with site preparation. The service and maintenance access roads would be scarified and compacted with water bars installed as necessary. Once a rough grade is completed, landscape cloth would be installed below the base rock to prevent the rock from being pressed into the native soils. Base rock would then be spread and compacted to create a road base. Gravel or other finish mix would be spread over the road base and compacted to the finished grade. Approximately 10,000 cubic yards would be purchased from regional suppliers and trucked into the area. If water bars are necessary, they would be cut across roads to allow for natural drainage of water over the road surface and to prevent road washout. Excavated soil and rock would be used for road construction or redistributed on-site. Larger excavated rocks would be buried or left on-site for erosion control.

After construction, all areas exhibiting soil disturbance would be surveyed for the presence of noxious weeds. Noxious weed control would be performed during construction, operation, and decommissioning according to the specifications stipulated in the Project's habitat restoration and integrated vegetation management plan.

2.7.7 SITE SECURITY FENCING AND LIGHTING

A security perimeter fence would surround the solar arrays within the Project area. The perimeter fences would be installed inside the ROW boundary by a nominal distance to avoid fence construction impacts that would extend beyond the ROW. Inside the fence, the Project would construct a fire break/unimproved perimeter access road of roughly 10-foot width. The perimeter fences would be 6 to 7 feet high and may use barbed wire in accordance with local requirements

and as required by the National Electrical Code and National Electrical Safety Code to prevent unauthorized entry. There would be two lockable, swinging security gates with access provided to emergency service providers. The facility's fences and gates would be marked with contact information for Federal, state, and local emergency providers.

Permanent lighting would be installed only at the operation and maintenance facility. Lighting would be motion-activated, shielded/downcast, and full cutoff, designed to limit upward light pollution and impacts to visibility outside the Project. Cables to power lights would be buried.

2.7.8 SWITCHYARD INTERCONNECTION

The power produced by the Project would be collected within the arrays via overhead and buried collection lines. This power would then be conveyed from the solar facility 1.7 miles to a planned and approved substation via several co-located 69 kV overhead electrical connection lines through a utility easement on La Paz County land. The connection lines would interconnect to the Cielo Azul 500-kV switching station and to the Ten West Link transmission line.

The electrical connection line would include single- or double-circuit 69 kV monopole steel towers for the line through the utility easement. Spans between individual structures would be 300–500 feet, resulting in a need for approximately 10 to 17 towers for each mile of line. Towers would be made of unpainted galvanized steel and would naturally dull from weathering. There is an existing underground natural gas pipeline that crosses the Project area, so the layout and electrical connection lines would be arranged to avoid conflict with this and any other existing easements.

The transmission line would consist of three power conductors, fiber-optic communications below the power conductors, and possibly a lightning protection shield wire above. The overhead structures would be 40–80 feet tall, depending on terrain and easement configuration. Structure design for the Project would adhere to all Federal Aviation Administration (FAA) and International Civil Aviation Organization regulations.

The Project would also incorporate design and construction methods in accordance with Avian Power Line Interaction Committee guidelines to minimize or avoid avian electrocutions and collision potential.

2.7.9 OPERATION AND MAINTENANCE FACILITY

The Project would include a single- or double-wide, approximately 2,000-square-foot premanufactured operation and maintenance building with electric power and lighting; plumbing and sanitation; and heating, ventilation, and air conditioning services. Up to 12 unpaved parking spaces, including spaces in compliance with the Americans with Disabilities Act, would be adjacent to the building. This building would provide a conditioned environment for the safety and health of operation and maintenance personnel. Plant monitoring and control equipment (for example, SCADA) may also be installed within the operation and maintenance building or in a separate freestanding insulated and conditioned enclosure.

The operation and maintenance building would be located close to the main Project site entrance and may be installed on a concrete pad foundation or on a driven pile foundation, subject to soil

conditions. Potable water from a well would be used for the building. A septic system would be installed for wastewater disposal.

A commercial power service and meter would be procured from and installed by Arizona Public Services to provide power to the switchgear and operation and maintenance facilities. If a commercial power service is not available, then the Project may install a small (approximately 5 kW), propane-powered generator (typical to many ranches and homes in the area), to provide power to the facility and the SCADA equipment. In case of a local grid power outage, a similarly sized standby generator would be employed.

2.7.10 CONSTRUCTION

2.7.10.1 Site Preparation

Site preparation would involve driving and crushing vegetation, as opposed to cutting or clearing and grubbing, to minimize impacts on plants and soil disturbance. Grading would occur in few locations, only as needed for roads and maintenance building sites. Clearing of these areas would be accomplished using a standard bulldozer, grader, or other similar earthmoving equipment. The grading would generally maintain existing contours and would balance the high and low spots. In addition, grading would be conducted to prepare for construction of the interior Project roads along electrical collection lines; however, the grounds below the electrical connection lines would not be substantially altered from their current conditions.

Revegetation techniques from short-term and permanent disturbance would be provided in the habitat restoration and integrated weed management plan.

Temporary access to the construction areas would be created by driving over minimal amounts of vegetation; no clearing and grading would be required. This construction method would minimize disturbance of soils and vegetation.

A SWPPP would be prepared prior to construction and would identify potential sources of pollution that may be reasonably expected to affect the quality of stormwater discharges from construction of the Project. The SWPPP would describe the implementation of protection measures, which would be used to reduce the pollutants in stormwater discharges associated with construction activity at the site.

2.7.10.2 Temporary Material Storage, Staging, and Laydown Areas

The Project would include approximately 45 acres of temporary construction facilities that would include secure staging areas for receiving and storing Project materials, water storage ponds, four to five temporary construction trailers with temporary electrical service and sanitation facilities, and parking for work trucks and personal vehicles for the construction crews.

Temporary material storage, staging, and laydown areas would be established within the Project area to store components and facilitate construction. The storage, staging, and laydown areas would be used for storing office trailers, parking construction and personal vehicles, storing construction equipment, and for temporary staging and laydown of construction materials.

Much of the Project area would be impacted by either short-term (construction) or long-term (life of Project) ground disturbance, either from compaction or grading. The Project's disturbance area is detailed in **Table 2-1**. Minimal grading would be required for the electrical connection structures in the utility easement on La Paz County land. Some mowing or temporary crushing may be required to clear vegetation where the structures would be erected and in some work areas as needed. Topsoil would not be removed.

Table 2-1. Short-Term and Long-term Area Disturbance

Project Component	BLM Short-Term Disturbance (Acres)	La Paz County Short-Term Disturbance (Acres)	BLM Long-Term Disturbance (Acres)	La Paz County Long-Term Disturbance (Acres)
Topography Leveling/Cut and Fill	0	0	0	0
Construction Laydown Areas	45	0	0	0
Stormwater Features	61	0	61	0
Construction Water Storage Ponds	4	0	0	0
Solar Arrays	2,747 [a]	0	<0.5 [b]	0
Inverter Pads	tbd	tbd	tbd	tbd
Battery Energy Storage System	tbd	tbd	tbd	tbd
Operation and Maintenance Facility	0	0	0.2	0
Substation	tbd	tbd	tbd	tbd
Fencing	0	0	<0.5	0
Interior Electrical Collection System (Aboveground)	tbd	tbd	tbd	tbd
Collector roads	tbd	tbd	tbd	tbd
Electrical Collection System in Utility Easement	0	38	0	<0.1

Notes:
a) To be conservative, the BLM assumes the delivery, assembly, and installation of solar equipment would impact most areas.
b) Support poles for PV modules
Key: **tbd** = to be determined

2.7.10.3 Temporary Water Storage Ponds

Two temporary construction water storage ponds would be located on-site during construction as shown on **Figure 2-2** and **Figure 2-3**. Each water storage pond would be an excavated impoundment, approximately 2 acres, and lined with a plastic or rubber liner, and would have a slight pitch to the corner closest to the transfer pump. Water storage ponds would be fenced to prevent use by cattle. Any surface water discharge would follow water quality and sediment management regulations.

2.7.10.4 Fueling Stations

Fueling stations would be established to service construction vehicles. Up to four 1,000-gallon aboveground diesel fuel tanks would be located at the material storage, staging, and laydown areas for vehicle and equipment fueling. Each fuel tank would be located within a temporary

secondary containment berm, equipped with a spill kit, and operated consistent with the Project's hazardous materials and waste management plan.

2.7.10.5 Construction Methods

Facility Foundations

Foundations for inverter stations would be driven steel I-beams with a steel skid structure over concrete pads approximately 11 feet by 37 feet and poured in place over prepared soils. Foundations/pads for other buildings or equipment would consist of a 4- to 12-inch-thick concrete base, poured in place over prepared soils. Buildings would consist of typical storage sheds or light-gauge materials.

Solar Arrays

The PV modules would be assembled and erected at each array site. The PV modules and array frames would be delivered to the specific site and offloaded and assembled using forklifts and physical labor. Support poles for the PV module trackers would be galvanized steel piles driven directly into native soil. No concrete foundations would be needed.

Electrical Distribution System

Electrical distribution system cables for each circuit would be buried in trenches. The trenches would be approximately 24–44 inches wide and 36–48 inches deep. In locations where two or more sets of underground lines converge, underground vaults and/or pad-mounted switch panels would be used to tie the lines together into one or more sets of larger feeder conductors.

Substation

The Project would interconnect to the Cielo Azul 500 kV switching station (as there is no voltage transformation, this is not a substation), to be constructed and owned by DCR Transmission, LLC, separate from the Project. Adjacent to the Cielo Azul switching station would be two substations to incorporate 500 69 kV transformers, constructed as part of the Atlas Solar Project (**Figure 2-2** and **Figure 2-3**). Jove Solar would be connected by several 69 kV circuits into one or both substations.

The two substations adjacent to Cielo Azul would follow similar construction methods. After site clearing is complete, construction of the substation would include excavating trenches that would be 12 inches wide and 18 inches deep in a grid. Next, the grounding grid would be installed. Copper-clad steel grounding rods would be driven into the ground at key locations and electrically bonded to the grounding grid.

The concrete foundations for switchgear equipment would be designed for the soil conditions at the site. Concrete would be trucked to the site from the nearest acceptable commercial source. Switchgear components such as the circuit breakers, metal-enclosed switchgear, disconnect switches, relays, battery and charger, surge arresters, AC and DC supplies, control house, SCADA, and grounding and associated control wiring would then be installed.

Electrical Connection Lines

Each 69 kV electrical connection line structure would be approximately 40–80 feet high and would require the installation of foundations, which are typically drilled concrete piers. Holes would be excavated for each structure. The holes would be drilled using a truck-mounted excavator equipped with augers of various sizes depending on the diameter and depth requirements of the hole to be drilled.

If the structure would require a concrete foundation, then concrete would be placed to fill the hole with reinforcing steel bars and anchoring bolts. Typically, concrete would be delivered directly to the site in concrete trucks with capacities up to 10 cubic yards. Each foundation would extend approximately 2 feet aboveground.

The towers would be brought to the site on tractor trailer flatbeds and offloaded to the temporary laydown area. The structure would then be assembled and fitted with crossarms, supports, and insulators per the final design. Assembly would be facilitated on-site by a small, truck-mounted crane. Subsequent to full or partial assembly, either the entire or the lower portion of the structures would be lifted onto the foundation using a large crane designed for erecting towers. Pulleys and winch trucks would be used to install each connection line and to place ground and communication cables in their final positions and tensions.

2.7.10.6 Construction Water Usage

The Project would use 1 to 1.5 acre-feet of water per MWac for Project construction, which equates to 900 acre-feet for the Project. A well would be installed on BLM land within the Project area, and water would be pumped from the well into temporary construction water storage ponds. This pond water would be used for compaction of electrical trenches and foundations, dust control, and truck wheel washing.

2.7.10.7 Construction Waste

The Project would involve the transportation of construction materials. Solid waste generated during construction would include debris such as concrete, wood, cardboard, brick, glass, plastics, scrap metal, and similar material and would be disposed of at a local landfill in accordance with local, state, and Federal regulations.

2.7.10.8 Construction Schedule

Construction would be completed in a single phase, with multiple construction crews specializing in various construction components. Construction would require 12–18 months. Construction after sunset during summer months would require localized use of temporary construction lighting.

2.7.10.9 Construction Equipment

Trucks transporting materials would access the Project area from I-10 to Hovatter Road and then along the AT&T Frontage Road leading to the Project area. The Applicant estimates that 96,125 vehicle trips (that is, 60,045 passenger/service truck trips, 15,830 large diesel trucks and trailer trips, and 20,250 water truck trips—if water needs to be trucked in) would be needed during the

construction phase of the Project. There would be construction parking for approximately 300 vehicles that would be unpaved.

In general, oversized trucks would not be used to transport PV module components to the Project area but may be required to deliver the main transformers. It is not anticipated that any road improvements would be needed to accommodate delivery and construction traffic along public roads and highways beyond adding gravel road base as further described in **Section 2.7.6**. A list of vehicles and equipment the Applicant proposes to use for facility construction is provided in **Table 2-2**.

Table 2-2. Vehicles and Equipment Used for Project Construction

Activity	Equipment Needed	
Road Construction	Bulldozer Dump Truck/Belly Dump Trucks Motor Grader Scraper	Drum Packer Gannon Tractor Rubber Tire Backhoe Excavator Water Truck
Electrical Work and Station Construction	Auger Rig Bobcat Cable Spool Truck Fork Truck to Offload Spools Materials/Waste Transportation Truck Water Truck	Backhoe Bulldozer Concrete Truck Excavator Gannon Tractor Trencher
Solar Array Assembly and Erection	Fork Truck Materials Transportation Truck Water Truck	Hydraulic Crane Vibratory Pile Driver
Project Cleanup	Dozer Front-end Loader Motor Grader	Dump Truck Materials/Waste Transportation Truck
Daily Construction Traffic	Buses Full-size Pickups Gators	FedEx, United Parcel Service Other Delivery Trucks

Transportation and construction contractors would obtain all necessary permits for transportation-related elements of the Project from ADOT, La Paz County, and any other relevant permitting agency. A traffic and transportation plan would be drafted to help ensure safety and minimize impacts on traffic flow in the vicinity of the Project.

Routine vehicle and equipment maintenance activities would be performed off-site or within the material storage, staging, and laydown areas. Broken-down vehicles or equipment would be trucked or towed off-site for repair.

To minimize potential impacts from the introduction and spread of noxious and invasive weeds due to vehicles entering construction areas, a habitat restoration and integrated weed management plan would be prepared.

2.7.10.10 Construction Workforce

During construction, an estimated average of 300 workers would be employed, with peak employment at approximately 600 workers. Most construction workers would be employees of construction and commercial electrical companies under contract to the Applicant or the Applicant's selected construction contractor. Construction workers would include a mix of locally hired workers for civil, electrical, and structural construction and specialized workers for the on-site electrical work, testing, and commissioning of Project components. Local hiring would depend on the availability of workers with the appropriate skills. No temporary or permanent on-site housing would be provided for construction, operation, maintenance, or decommissioning workers.

The spring and fall seasons would be busiest, while local weather is favorable. Following principal construction, the workforce would reduce from a peak of 600 employees to less than 20 people. The Applicant would employ qualified local and non-local contractors or subcontractors according to the equipment and personnel needs of the Project. The Applicant anticipates that a large percentage of the workforce would be from Arizona, although specialty workers from various parts of the country may be required.

2.7.11 OPERATION, MONITORING, AND MAINTENANCE

2.7.11.1 Site Maintenance

After construction, systems, controls, and safety equipment would be calibrated and tested before being placed in service. Qualified technicians, electricians, and mechanical and electrical experts would test and inspect solar components, transformers, communications systems, switchgear, and interconnection systems to help ensure that they comply with required specifications and are working properly. After construction, on-site personnel would operate and maintain the Project. Public access is anticipated to be restricted to protect public safety and prevent vandalism.

Routine maintenance of the PV module arrays would be necessary to optimize performance and to detect potential malfunctions. Operation and maintenance procedures would be established that define specific routine PV module array maintenance and inspection activities based on the PV module manufacturer's recommendations.

Transformers and inverter units would be maintained as part of normal operation and maintenance activities. Underground electrical collection lines would be inspected approximately once per year for conductor soiling, corrosion or oxidation, operating temperatures, and physical damage. These activities would be undertaken pursuant to prudent utility practices. Switchgear maintenance activities would include routine and scheduled equipment maintenance, groundskeeping, and emergency maintenance in the event of equipment failure. Switchgear maintenance would be performed by Project personnel or approved contractors. Inoperative PV modules would be repaired, replaced, or removed in a timely manner.

PV module surfaces require cleaning to maintain their optimized performance. Project personnel would conduct periodic cleaning using dry brushing or vehicles equipped with washing equipment. Each PV module array would be cleaned up to twice a year. This frequency and optimum timing would be determined by monitoring Project performance versus weather throughout each year of operation.

Routine maintenance would include weed monitoring and treatment that would be outlined in a habitat restoration and integrated weed management plan.

2.7.11.2 Hazardous Materials

Materials typically used for operation and maintenance of the Project may include mineral or biodegradable transformer dielectric fluids, natural or synthetic oils as lubricants, cleaning agents, and herbicides for weed control. These materials, some of which may be hazardous, would be stored securely at the operation and maintenance facility. Batteries, which would be used for switchgear tripping, uninterruptible power supplies for SCADA and computers, and the BESS, may include hazardous materials.

Hazardous materials use, storage, and disposal would be in accordance with the Project's hazardous materials and waste management plan and would comply with applicable Federal, state, and local environmental laws and regulations. The plan would identify hazardous materials that would be used, stored, or transported and establishes inspection procedures, storage requirements, storage quantity limits, inventory control, non-hazardous product substitutes, and methods for disposal of excess materials.

The plan would also identify requirements for notices to Federal, state, and local emergency response authorities and include emergency preparedness and response plans, including spill response. Accidental releases of hazardous materials would be prevented or minimized through proper containment during transportation to the site, storage on-site, and use. Hazardous wastes would be removed and disposed of off-site in an appropriately permitted disposal facility.

Hazardous substances or hazardous wastes that are oils or mixed with oils would be addressed in a hazardous materials and waste management plan. The hazardous materials and waste management plan would be supplemented by other plans, as necessary, describing control and response procedures for other hazardous materials or wastes regulated by the Resource Conservation and Recovery Act.

The Project's hazardous materials and waste management plan would also identify the waste streams expected to be generated at the site and address solid waste determination procedures, waste storage locations, waste-specific management and disposal requirements, inspection procedures, and waste minimization procedures. Disposal of liquid and solid waste produced during operation of the solar energy facility would be done so as not to impact human health and the environment.

2.7.11.3 Supervisory Control and Data Acquisition System and Fiber-Optic Communications

The Project proposes installing a SCADA system to collect operating and performance data from the Project and to provide for remote operation of the facility. The PV modules would be linked to a central computer in the operation and maintenance building and to a remote operations center by an on-site fiber-optic network. In addition, the PV modules would be linked to off-site cellular, telephone, microwave, or satellite communications via a 20-foot lattice construction microwave tower located near the operation and maintenance building. The fiber-optic cables used for SCADA communication would be buried with the electrical distribution system in a trench carrying the electrical collection lines to the operation and maintenance building.

The SCADA system would interface with the local utility grid operations to allow the utility to monitor plant operations and to disable Project output in case of safety or grid-operation requirements.

2.7.11.4 Operational Water Use

Up to 5.3 acre-feet of annual water consumption is estimated for operation and maintenance activities at the solar facility, including approximately 0.75 gallon of water per PV module for panel cleaning. No solvents or surfactant chemicals would be used to clean the PV modules, and no wastewater would be generated during panel washing as water would be absorbed into the surrounding soil or would evaporate. Annual water use would be tracked and reported to the BLM.

During operation, minimal water would be required for the electrical connection lines and switchyard. Restroom facilities would use a permanent aboveground septic tank. This water would be obtained from the well installed for the construction water supply.

2.7.11.5 Operations Workforce

Once operational, the Project would employ six to eight full-time employees for facility management, facility maintenance, site security, and other operation-related needs.

The operations workforce would include off-site facility managers, administrative support, SCADA instrument and PV module technicians, and other monitoring and maintenance personnel. During the warranty period comprising the first several years of Project operations, additional personnel employed by the component manufacturer(s) may be on-site conducting equipment performance monitoring and calibration.

2.7.12 DECOMMISSIONING AND SITE RECLAMATION

2.7.12.1 Facility Decommissioning

Decommissioning is a systematic deconstruction process that involves removal and off-site recycling, reuse, and disposal of the infrastructure and associated facilities within a solar energy facility. Many of the activities involved with Project decommissioning are similar to those performed for Project construction.

In general, decommissioning of the Project would involve disassembling the PV arrays and associated infrastructure and salvaging valuable equipment, such as PV array steel, electrical transformers, substation and switchyard components, and materials such as steel and copper. The Applicant would attempt to salvage economically recoverable materials and recycle solar energy components for future uses. Unsalvageable materials would be disposed of at authorized locations. Associated infrastructure, including conductors, cables, poles, and roads would be removed. Demolition or removal of equipment and facilities would meet applicable environmental and health regulations.

Following the removal of Project facilities, the site would undergo final cleanup and reclamation as outlined in the Decommissioning and Site Reclamation Plan. Concrete foundations would be removed to 3 feet below grade and reseeded, as appropriate. Areas disturbed during removal of Project features would be restored and rehabilitated as near as possible to their preconstruction

condition and would be available for the same uses that existed prior to construction of the Project.

The groundwater wells at the facility would be decommissioned by an Arizona-licensed well driller using protocols outlined in an ADWR well abandonment permit.

2.7.12.2 Electrical Connection Line Decommissioning

Similar activities would occur with the decommissioning of the electrical connection lines. The electrical lines and structures would be removed using trucks and cranes and placed in a designated laydown area. The electrical power conductors would be removed from the poles and recycled, as would be the metal poles and lattice structures. Any material deemed hazardous or unusable would be trucked off-site using tractor trailers and disposed of at authorized locations. If foundations are used for metal structures, they would be removed to a minimum of approximately 3 feet below the surface. All foundation holes would be refilled, compacted, and reseeded as appropriate. The unimproved service and maintenance route along the corridor would be scarified and compacted. Water bars would be placed where necessary to prevent erosion, and the route would be reseeded in accordance with the approved reclamation plan.

2.7.12.3 Reclamation and Revegetation

Areas that have been temporarily disturbed by grading or other earthmoving activities would be restored to the preconstruction contours of the land to the extent possible and consistent with future operating needs. Reclamation work may consist of recontouring areas, establishing vegetation, and applying mulch or cover crops to provide additional erosion control. Ungraded areas disturbed by overland travel would be assessed in coordination with BLM to determine whether reclamation is needed for area recovery.

Temporary disturbance areas would be revegetated using seed mixtures and techniques developed in consultation with the BLM. The habitat restoration and integrated vegetation management plan would continue on-site during the reclamation process according to the specifications stipulated in the Project's noxious and invasive weed control plan. Active management after initial seeding would help ensure the success of the revegetation process.

2.8 Alternatives Considered but Eliminated from Detailed Analysis

The Applicant and BLM considered several alternatives that were subsequently eliminated and not analyzed in detail. These alternatives included areas removed from the Utility Corridor (see **Section 2.8.3** below), as this would have required a Plan Amendment; discarding other interconnection facilities, as the Cielo Azul substation provided a closer option requiring a shorter gen-tie; and, many other locations had competing solar energy applications. The rationale for eliminating these alternatives from detailed analysis was common to all: these alternatives did not reduce or eliminate adverse environmental effects while still meeting the Project's purpose and need.

2.8.1 ALTERNATIVE LOCATIONS

The Applicant considered several alternative Project site locations along the route of the approved Ten West Link transmission corridor. Private, state, and BLM sites were all reviewed

and eliminated from consideration based on distance to the Ten West Link interconnection facility, solar production effectiveness, potential hydrogeology effects, biological and cultural areas of significance, and other potential resource issues. The selected location is favorable to the Applicant as it is close to or shares borders with other projects planned by the Applicant. Accordingly, there is opportunity for the Project to share facilities with other planned projects.

2.8.2 ALTERNATIVE TECHNOLOGIES

Other means of renewable power generation that may have satisfied Project needs include wind energy or solar thermal generation. According to the Applicant, this location is not favorable to wind energy generation due to relatively low wind speeds and poor wind resource quality. Solar thermal generation requires increased land area and (typically) large amounts of water consumption per year. In addition, if not properly sited, wind and solar thermal facilities may have greater visual and biological impacts than PV solar development. Therefore, these alternative technologies were eliminated from consideration.

2.8.3 ALTERNATIVE PROJECT DESIGN

The Applicant originally designed the Project to include an additional approximately 1,100 acres to the south. However, upon discussions with the BLM, it was determined that this area overlapped with a BLM utility corridor (the Palo Verde-Devers and El Paso Natural Gas Corridor) and would require an amendment to the Yuma RMP. Further, it would not conform to guidance from the RDEP that solar projects should not place panels or non-transmission infrastructure within designated utility corridors. The Applicant decided to not pursue a plan amendment for the Project. Therefore, the Applicant changed the Project application to exclude the area within the BLM utility corridor.

2.8.4 ALTERNATIVE GEN-TIE TRANSMISSION DESIGN

This alternative would have deployed a single, 500 kV gen-tie line between the Project generation area and the Cielo Azul Substation, rather than a series of 69 kV lines. However, a 500 kV alternative would have required 180–200 foot tall structures; whereas, the 69 kV option can be constructed on roughly 80 foot poles. The taller structures would require lighting to comply with FAA regulations and would have greater visual impacts, illuminate the night sky, and have adverse effects on some wildlife and other resources beyond those resulting from the series of 69 kV lines. Therefore, this alternative was eliminated from detailed analysis.

3 Affected Environment and Environmental Impacts

3.1 Introduction and Affected Environment

The Proposed Action spans 3,495 acres administered by the BLM and 38 acres of county-administered land in southeastern La Paz County. The affected environment establishes the baseline from which environmental effects are assessed and provides the area of analysis for each resource, to provide context and to capture direct and indirect effects. The affected environment varies by resource, and includes the area potentially directly and indirectly affected by the Proposed Action or Action Alternatives.

This EIS is issue-focused: for any resources that are not present, would not be impacted, or for which the impact would be so low that impact significance is not in question, that resource has been dismissed from detailed analysis (**Section 3.1.5**, and **Appendix B**). All resources requiring detailed analysis are presented in the following sections and follow a similar structure. For each resource, this chapter discusses the impact-causing elements relevant to assessing impacts on that resource; lists the issues identified for analysis; describes the impact indicators used; lists data sources and assumptions relevant to the analysis, then cites relevant laws and/or pertinent regulations; describes the current conditions or affected environment within the Action Area, including past, present, and reasonably foreseeable actions; provides the methods and analysis used to describe effects; discusses the nature of environmental consequences, if any; and last, if there are potential additional steps that could be taken to avoid or reduce impacts from the Action Alternatives, those mitigation measures are listed and the impacts of the mitigation are described.

3.1.1 EFFECT INDICATORS AND IMPACT ASSESSMENT

Various environmental resources, uses, or elements could be affected by the Proposed Action, Action Alternative, and the No Action Alternative. Effects are those changes, both beneficial and/or adverse, which would cause modification to the existing condition of the environment and/or probable future conditions that would result from the Action Alternatives and the No Action Alternative. Effects are evaluated at a scale that is dependent upon the resource in question in the affected environment. Impacts can be direct or indirect; direct impacts are those effects that are caused by the action or alternative and occur at the same time and place, while indirect impacts are those effects that are caused by or would result from an alternative, that are later in time, but that are still reasonably certain to occur. Permanent effects are those that would remain for the life of the Project or after mitigation. Temporary effects are those that would occur for a limited time, such as during construction or decommissioning, but would not remain after reclamation or restoration. Cumulative effects are those beneficial and/or adverse impacts that would result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions.

Environmental effect categories provide defined criteria to assign relative levels of effects in terms of intensity and context, and to provide a common language when describing these effects. General terminology is provided and defined (**Table 3-1**). However, effect category descriptions may differ from those presented below for particular resources.

Table 3-1. Summary of Terms Used to Describe Environmental Effects in the EIS

Attribute of Effect		Description[1]
Magnitude (Intensity)	No impact	There would be no change to the current condition of resource as a result of Project construction, operation, maintenance, or decommissioning.
	Negligible	A minute, very small, nearly undetectable, or unmeasurable change in current conditions.
	Minor	A small, but measurable change in current conditions.
	Moderate	An easily discernible and measurable change in current conditions.
	Major	A large, easily measurable change in current conditions.
Duration	Temporary (short term)	During construction (1.5–2 years), up to 10 years. The same interval would apply to decommissioning.
	Permanent (long term)	More than 10 years.

[1] Descriptions are typical but may vary by resource.

3.1.2 MITIGATION MEASURES

Mitigation means applying measures that avoid, minimize, or compensate for effects caused by an action. While NEPA requires consideration of mitigation, it does not mandate the form or adoption of any mitigation. Mitigation includes:

1. Avoiding the impact altogether by not taking a certain action or parts of an action.
2. Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
3. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
4. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
5. Compensating for the impact by replacing or providing substitute resources or environments.

Mitigation measures may be developed where applicable, based on potential for adverse effects from the Project. They are designed to be adequate and effective in accordance with Council on Environmental Quality regulations (40 CFR 1508.20). The environmental analysis and documents produced in the NEPA process should provide the decision maker with relevant and timely information about the environmental effects of the decision and reasonable alternatives to mitigate impacts.

3.1.3 TRENDS AND ACTIONS

Trends and actions are those events that have occurred, and those that are reasonably expected to continue to occur and that have shaped the existing condition of the resource. Reasonably foreseeable actions are those that are the subject of existing decisions, funding, or formal proposals, or are otherwise highly probable. When combined with past and present actions, the

reasonably foreseeable trends and actions form the affected environment for each of the resources and issues analyzed in this chapter.

3.1.4 RESOURCES AND ISSUES ELIMINATED FROM DETAILED ANALYSIS

Several resources and issues were dismissed entirely or in part from detailed analysis (**Appendix B**):

- Fire and Fuels
- Geological Hazards, Minerals, and Mining
- Hazardous Materials and Solid Wastes
- Land Use (in part)
- Public Health and Safety (in part)
- Recreation
- Water Resources (in part)

The remaining resources and resource-specific issues are analyzed in detail in this chapter.

3.1.5 CUMULATIVE EFFECTS

The cumulative analysis addresses the potential for environmental impacts resulting from the incremental impacts of each alternative, including the No Action Alternative, when added to other past, present, and reasonably foreseeable future actions. The impacts of other actions are considered without regard to the agency (federal or non-federal), organization, or person that undertakes them. The cumulative effects analysis is accomplished through the following steps:

- Establish the duration of effects;
- Establish the geographic scope for the analysis;
- Identify potential significant cumulative effects associated with the alternatives in conjunction with the cumulative actions; and
- Provide a cumulative effects analysis and discussion.

The actions described in **Table 3-2** and shown in **Figure 3-1** are the major projects that are ongoing or reasonably foreseeable and could, along with the Proposed Action and other alternatives analyzed here, contribute to cumulative effects.

Additional past, present, and future activities that contribute to environmental impacts in the Project area are described after the table.

Table 3-2. Past, Present, and Reasonably Foreseeable Future Actions

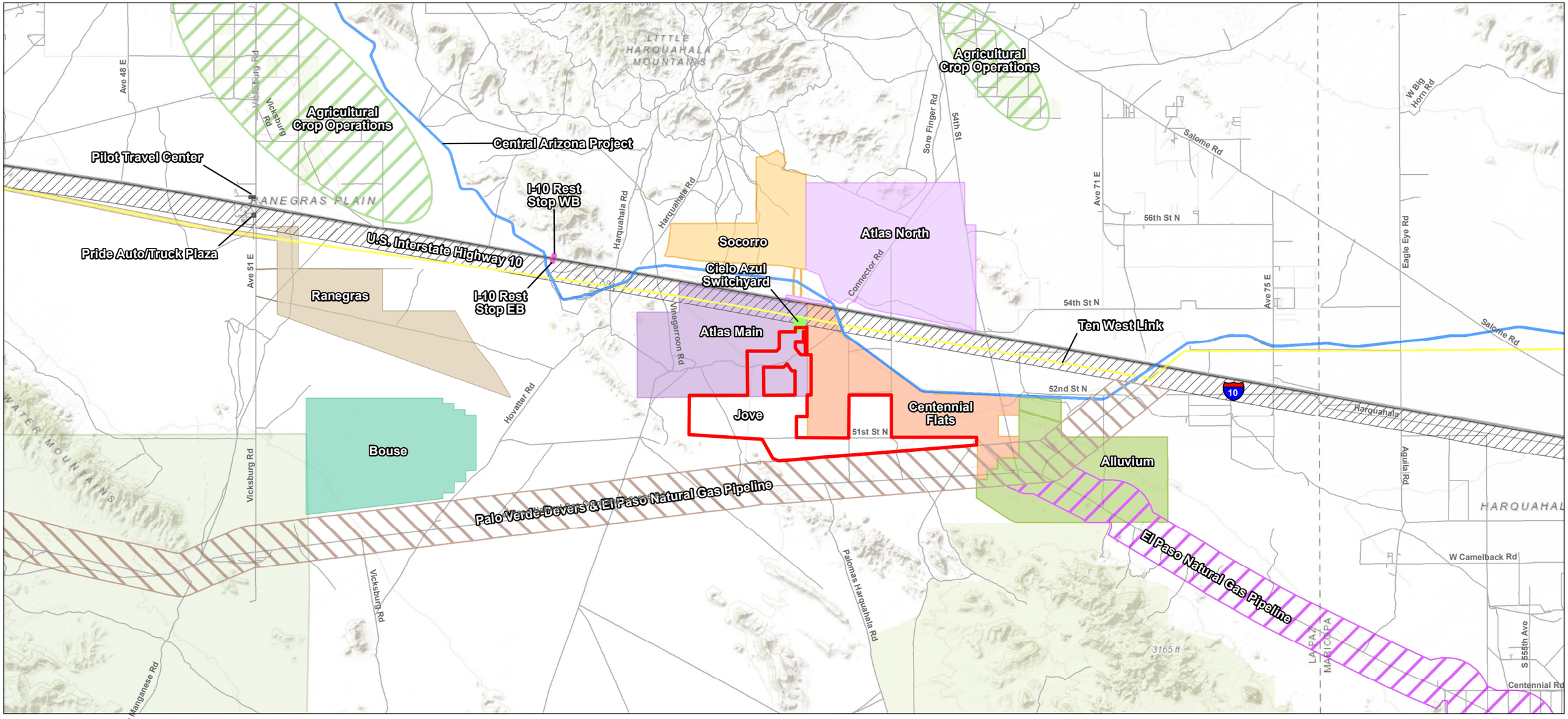
ID	Project Name	Location	Owner / /Lessee	Status	Acres	Project Description
1	Atlas Main Solar Project	Adjacent to and north of the Jove Solar Project	La Paz County, ASLD/174 Power Global	Pending siting approvals with ASLD	5,895	300 MW PV solar project, with battery storage, on ASLD and other lands
2	Centennial Flats Solar Project	Adjacent to and north of the Jove Solar Project	ASLD/Upstrea m HC-1 LLC	Pending siting approvals with ASLD	4,886	500 MW or more from solar PV arrays and BESS on ASLD land; 3.4-mile-long, 500 kV transmission line corridor connecting to Cielo Azul Switchyard
3	Central Arizona Project (CAP)	0.5 mile north of the Jove Solar Project	Bureau of Reclamation; operated by Central Arizona Water Conservation District	Operational since 1993	N/A	CAP is a concrete-lined, 336-mile long canal system that delivers Colorado River water from near Lake Havasu to central and southern Arizona
4	Communications Site Federal Facility	0.5 mile east of the Jove Solar Project	Federal Aviation Administration	Operational	3.26	Communications tower and ancillary facilities.
5	Stanley Solar (formerly Alluvium Solar)	0.6 mile east of the Jove Solar Project	BLM/Sawtooth Development-Copia Power	Variance application submitted to BLM	Un-known	Solar PV project
6	Interstate Highway 10	1 mile north of the Jove Solar Project	U.S. Federal Highway Administration	Operational	N/A	Four lane interstate highway with controlled access
7	Communication Site (AZA 030489)	1 mile east of the Jove Solar Project	American Towers LLC	Operational	0.22	250-foot-tall, self-supporting communications tower with ancillary facilities
8	Ten West Link 500 kV Transmission Line	1.5 miles north of the Jove Solar Project	ASLD, BLM, private/Ten West Link	Estimated completion 2025	N/A	126-mile bulk power transmission line connecting Delaney substation near Tonopah, Arizona, to an existing substation near Blythe, California

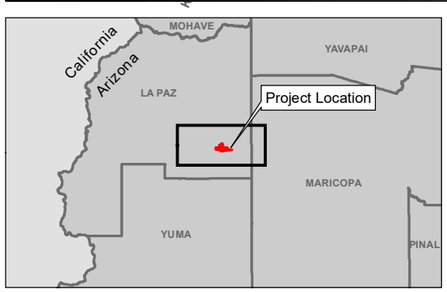
ID	Project Name	Location	Owner / /Lessee	Status	Acres	Project Description
9	Cielo Azul Switchyard	1.5 miles north of the Jove Solar Project (Jove Solar would connect into Cielo Azul via the proposed 1.5-mile, 69kV gen-tie transmission line)	DCR Transmission, LLC	Approved, estimated in service by 2024	55	500 kV switchyard that connects to the Ten West Link 500 kV transmission line
10	Atlas North Solar Project	2 miles north of the Jove Solar Project	ASLD/174 Power Global	Pending siting approvals with ASLD	7,563	1,000 MW PV solar project, with battery storage, on ASLD and other lands.
11	Oil & Gas Pipeline (AZPHX 0086056)	2 miles east of the Jove Solar Project	Kinder Morgan Energy Partners LLC and El Paso Nat. Gas Co.	Operational	25-ft wide linear facility	Buried oil and gas pipeline
12	Electrical Powerline (AZA 018891)	2 miles east of the Jove Solar Project	Arizona Public Service	Operational	10-ft wide linear facility	12 kV electrical transmission line
13	Socorro Solar Project	3 miles north of the Jove Solar Project	BLM/EDF Renewables	Pending approval by BLM	5,861	350 MW solar PV facility plus up to 350 MW battery storage and a 350 kV gen-tie line in La Paz County
14	Bouse Wash I-10 Rest Stop	4 miles northwest of the Jove Solar Project, along I-10.	Arizona Dept. of Transportation	Operational	21	Interstate highway rest stop
15	Ranegras Plains Energy Center Solar and Storage Project (AZA 038324)	4 miles northwest of the Jove Solar Project	BLM/Ranegras Plains Energy Center LLC	Pending approval by BLM	4,930	700 MWac PV solar and battery storage project proposed on public land managed by the BLM in La Paz County, Arizona
16	Bouse Solar and Storage Project (AZA 038391)	5 miles west of the Jove Solar Project (near northeast corner of Kofa NWR)	BLM/Revolve Renewable Power AZ LLC	Pending approval by BLM	6,155	1,000 MWac PV solar plus BESS project on BLM land in La Paz County, Arizona

ID	Project Name	Location	Owner / /Lessee	Status	Acres	Project Description
17	Agriculture crop operations	Two areas: 4.5 miles to northeast and 13 miles to the northwest of the Jove Solar Project	Various	Operational	9,700	Agriculture
18	Two travel centers at New Hope/I-10 off-ramp: Pilot Travel Center and Pride Auto/Truck Plaza.	6 miles west of the Jove Solar Project; New Hope off-ramp.	Pilot: Berkshire Hathaway and Pilot Co. Pride: Pilot/Flying J	Operational	N/A	Fuel and services for I-10 travelers and truckers

Key: **ASLD** = Arizona State Land Department; **BESS** = battery energy storage system; **BLM** = Bureau of Land Management; **CAP** = Central Arizona Project; **MW** = megawatt(s); **MWac** = megawatts of alternating current; **PV** = photovoltaic.

Additional past, present, and future activities and uses that contribute to environmental impacts in the Project area include cattle grazing, off-road vehicle use, dispersed recreational activities, wood cutting, agriculture, transportation, energy facilities, pipelines and transmission lines, housing, and commercial developments.





Jove Solar Project Site

Other Projects

- Agriculture Crop Operations
- Alluvium Solar Project
- Atlas Main Solar Project
- Atlas North Solar Project
- Bouse Solar Project
- Centennial Flats Solar Project
- Central Arizona Project
- Cielo Azul Switchyard
- El Paso Natural Gas
- I-10 Rest Stops
- Interstate 10
- Palo Verde-Devers & El Paso Natural Gas Pipeline
- I-10 Travel Centers
- Ranegras Plains Solar Project
- Socorro Solar
- Ten West Link

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Figure 3-1
Cumulative Projects

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3.2 Air Quality, Greenhouse Gases, and Climate Change

The geographic analysis area for air quality is the Project area and the associated airshed in La Paz County. The scope of the temporal analysis for this resource is the duration of the Project (30 years).

The following resources are analyzed in detail in this section:

- Air quality
- Greenhouse gases and climate change

3.2.1 AIR QUALITY

Project construction, operation and maintenance, and decommissioning activities would result in air pollutant emissions. Sources of emissions include construction equipment and vehicle exhaust in addition to fugitive dust from earthmoving activities and vehicle travel. Emissions would occur at some level over the duration of the Project with the majority occurring during the construction phase.

Issues:

- How would criteria pollutants, hazardous air pollutants, and fugitive dust created during construction, operation and maintenance, and decommissioning affect air quality?

The following impact indicators were used to analyze this issue:

- Emission estimates for regulated pollutants that could exceed applicable regulations
- Project emission estimates in comparison to county emission inventories

Data sources evaluated in this analysis include the following:

- Jove Solar Project Air Quality Emissions Report (AZTEC Engineering 2022)
- EPA National Emissions Inventory (NEI) (EPA 2020)

Assumptions:

Emissions estimates for the Project were conducted using the following information and assumptions:

- Fugitive dust emissions from vehicle travel on paved and unpaved roads were estimated using emission factors and calculations from EPA's Compilation of Air Pollutant Emission Factors Sections 13.2.1 and 13.2.2 (EPA 2011, 2006).

- Fugitive dust emissions from earthmoving activities were estimated using the Western Regional Air Partnership's (2006) Fugitive Dust Handbook. It is assumed that 50 acres of land disturbance would occur in a single day during site preparation. Total ground disturbance would be 3,533 acres (Jove Solar, LLC 2023).

- Construction equipment is assumed to operate eight hours per day, five days per week. The default load factors provided in EPA's Motor Vehicle Emissions Simulator were used for calculations.

- Four diesel generators (each rated at 20 kilowatts) would run 24 hours per day, seven days per week for the first month during the commissioning process and then run eight hours per day, five days per week for two additional months.

- Four hundred construction workers per day would commute to the site during construction with an average distance of 100 miles round trip per day.

- Two hundred delivery trucks would deliver materials and equipment to the site during construction with an average distance of 600 miles round trip per day.

- Eight employees per day would commute to the site during operation and maintenance with an average distance of 100 miles round trip per day.

- Four vehicles would conduct maintenance and inspection activities during operation for four hours per day.

- Off-road and on-road vehicle and equipment emissions were estimated using the latest version of the EPA's Motor Vehicle Emissions Simulator factors for La Paz County, Arizona.

- The types of equipment, quantity, and duration of use during construction that were used in determining total emissions from construction equipment and vehicles were provided by Jove Solar, LLC (2023).

3.2.1.1 Affected Environment

Background

The Clean Air Act (CAA) of 1970 requires the EPA to establish the National Ambient Air Quality Standards (NAAQS), which set maximum allowable concentrations for six criteria pollutants: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM), sulfur dioxide (SO_2), and lead (Pb). The primary standards are designed to provide an adequate margin of safety essential to protecting public health. The secondary standards are intended to protect public welfare from any known or anticipated adverse effects associated with the presence of a criteria pollutant in the ambient air (**Table 3-3**).

Table 3-3. National Ambient Air Quality Standards

Pollutant		Averaging Time	Primary Standard	Secondary Standard	Form
Carbon Monoxide (CO)		1-hour	35 ppm	None	Not to be exceeded more than once per year
		8-hour	9 ppm	None	Not to be exceeded more than once per year
Lead (Pb)		Rolling 3-month average	0.15 µg/m^3 [1]	0.15 µg /m^3 [1]	Not to be exceeded
Nitrogen Dioxide (NO_2)		1-hour	100 ppb	None	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		Annual	53 ppb [2]	53 ppb [2]	Annual mean
Ozone (O_3)		8-hour	0.070 ppm [3]	0.070 ppm [3]	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
Particle Pollution (PM)	PM_{10}	24-hour	150 µg /m^3	150 µg /m^3	Not to be exceeded more than once per year on average over 3 years
	$PM_{2.5}$	24-hour	35 µg /m^3	35 µg /m^3	98th percentile, averaged over 3 years
		Annual	12.0 µg /m^3	15.0 µg /m^3	annual mean, averaged over 3 years
Sulfur Dioxide (SO_2)		1-hour	75 ppb [4]	None	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		3-hour	None	0.5 ppm	Not to be exceeded more than once per year

Source: U.S. Environmental Protection Agency (EPA 2022)
Key: Units of measure for the standards are parts per million (**ppm**) by volume, parts per billion (**ppb**) by volume, and micrograms per cubic meter (**µg/m^3**) of air. **PM_{10}** equals particulate matter with an aerodynamic diameter of 10 microns or less. **$PM_{2.5}$** equals particulate matter with an aerodynamic diameter of 2.5 microns or less.
Notes:
1) In areas designated nonattainment for the Pb standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 µg/m^3 as a calendar quarter average) also remain in effect.
2) The level of the annual nitrogen dioxide standard is 0.053 ppm. It is shown here in terms of ppb for the purposes of clearer comparison to the 1-hour standard level.
3) Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) ozone standards are not revoked and remain in effect for designated areas. Additionally, some areas may have certain continuing implementation obligations under the prior revoked 1-hour (1979) and 8-hour (1997) ozone standards.
4) The previous sulfur dioxide (SO_2) standards (0.14 ppm 24-hour and 0.03 ppm annual) will remain in effect in certain areas: (1) any area for which it is not yet one year since the effective date of designation under the current (2010) standards, and (2) any area for which an implementation plan providing for attainment of the current (2010) standard has not been submitted and approved and which is designated nonattainment under the previous SO_2 standards or is not meeting the requirements of a state implementation plan call under the previous SO_2 standards (40 Code of Federal Regulations 50.4(3)). A state implementation plan call is an EPA action requiring a State to resubmit all or part of its state implementation plan to demonstrate attainment of the required National Ambient Air Quality Standards.

The EPA assigns classifications to geographic areas based on monitored ambient air quality conditions. Areas that meet the standards of a pollutant subject to NAAQS are classified as being in attainment for that pollutant. Areas that do not meet the NAAQS for a pollutant are designated as being in nonattainment for that pollutant. Areas that cannot be classified based on available information for a pollutant are designated as being unclassified. An area's attainment status is designated separately for each criteria pollutant; one area could have all three classifications. If a region is designated as nonattainment for a NAAQS, the CAA requires the State to develop a state implementation plan. A state implementation plan provides for the implementation, maintenance, and enforcement of the NAAQS and includes emission limitations and control measures to attain and maintain the NAAQS. The Project is in La Paz County, Arizona. La Paz County is classified by the EPA as being in attainment for all criteria pollutants for which there are NAAQS.

The General Conformity Rule under CAA Section 176(c)(4) applies to all Federal actions that take place in areas designated as nonattainment or maintenance. The rule establishes a threshold for determining whether actions would have significant impacts to air quality. Because La Paz County is in attainment for all criteria pollutants, the General Conformity Rule does not apply.

Prevention of Significant Deterioration (PSD) is a CAA permitting program for new major sources or major modifications of existing sources of air pollution that are in attainment areas. PSD is designed to protect public health and welfare and to preserve, protect, and enhance the air quality in national parks, wilderness areas, monuments, and other areas of special value. The program applies to new (or modified) major stationary sources in attainment areas; major sources are defined as those sources that emit 100 tons per year or more of any criteria pollutant for specifically listed source categories or that emit 250 tons per year of any criteria pollutant and are not in a specifically listed source category.

Under PSD regulations, the EPA classifies areas as either Class I, Class II, or Class III. Class I areas are areas of special national or regional natural, scenic, recreational, or historic value. PSD regulations provide special protection for these areas to preserve, protect, and enhance air quality. No areas designated as Class I areas are present in the Project area or La Paz County.

The Interagency Monitoring of Protected Visual Environments program monitors visibility conditions, tracks changes in visibility, and works to identify sources and causes of regional haze at all Class I areas. No areas designated as Class I areas are present in the Project area or La Paz County.

The Regional Haze Rule (EPA 1999) directs Federal and State agencies to work together to improve visibility in 156 national parks and wilderness areas designated as Class I areas. Regional haze reduces long-range visibility over a wide region. Section 169A of the CAA sets forth a national goal for visibility. The rule requires states to demonstrate reasonable progress toward the "prevention of any future, and the remedying of any existing, impairment to visibility" in Class I areas for which impairment results from human-made air pollution. No areas designated as Class I areas are present in the Project area or La Paz County.

The Federal Land Managers' Air Quality Related Values Work Group was formed to develop a more consistent approach for the Federal land managers to evaluate air pollution effects on their resources. Values related to air quality are resources that may be adversely affected by a change

in air quality, including visibility and sulfur and nitrogen deposition. The Federal Land Managers' Air Quality Related Values Work Group issued a guidance document for the methodology and air quality related values criteria used to evaluate adverse impacts. The guidance recommends an analysis of visibility impairment at Class I areas within 50 kilometers of a Federal action. No areas designated as Class I areas are present in the Project area or La Paz County.

State Regulations

Sources located in La Paz County fall under the jurisdiction of ADEQ Air Quality Division. The Project would require an air quality permit from ADEQ.

ADEQ operates a network of ambient air quality monitors throughout Arizona for a variety of Federal and State monitoring programs. The primary monitoring objective is to measure criteria pollutants regulated under the CAA for compliance with the NAAQS. Pollutants measured by this network include criteria pollutants (that is, PM_{10}, $PM_{2.5}$, O_3, CO, sulfur oxides, nitrogen oxides (NO_X), and Pb) and certain air toxins. Meteorological data (section below) is also collected to support the analysis of the pollutant data and to determine the occurrence of exceptional wind events. ADEQ currently collects data from one air monitoring station located in Alamo Lake in the northeast section of La Paz County, approximately 50 miles northeast of the Project area. La Paz County is designated as attainment for all criteria pollutants.

Meteorology

The Project area is characterized by extremely hot summers, mild winters, and low precipitation. Average daily maximum temperatures during the summer months range between 102 degrees and 106 degrees Fahrenheit (°F). Average minimum daily temperatures in the winter months range between 37°F and 43°F. Annual precipitation averages just less than 7 inches and occurs in the form of rain. Average wind speeds range between 10 and 13 miles per hour.

Emission Inventory for La Paz County

The NEI is an annual estimate of emissions compiled from data collected from EPA, state, local, and Tribal Nations air agencies. The NEI includes emissions estimates from many sources, including point sources (such as power plants, manufacturing facilities, and airports), nonpoint sources (such as asphalt paving, solvent use, and residential heating), on-road sources (such as delivery trucks, buses, and passenger vehicles), non-road sources (such as construction equipment, lawn and garden equipment, and trains), and event sources (such as prescribed fires and wildfires).

The most recent NEI was conducted in 2020 (EPA 2020). La Paz County lacks dust ordinances, and mobile emissions were the biggest contributors to CO and NO_X emissions. Biogenic emissions were the biggest contributors to volatile organic compounds. Dust was the biggest source of emissions of particulate matter with an aerodynamic diameter of 10 microns or less (PM_{10}) and particulate matter with an aerodynamic diameter of 2.5 microns or less ($PM_{2.5}$). Mobile emissions, fuel combustion, and fires contributed the most to SO_2 pollution.

Trends and Actions

Existing primary sources of air pollutants within the vicinity of the Project area are vehicles traveling along I-10, occasional vehicle and OHV use of dirt roads, and winds that entrain dust. The closest permitted source within the Project area is the El Paso Natural Gas Co – Wenden Compressor Station, 1 mile east of the Project.

Future trends and actions near the Project area include industrial development and population growth focused near Tonopah, Arizona, which would increase mobile-source emissions. There are six additional solar projects and a transmission line that are either currently proposed or under construction within approximately 10 miles of the Project.

3.2.1.2 Impacts

No Action Alternative

Under the No Action Alternative, the Project would not be developed. Existing land uses and activities in the area would continue as would existing sources of emissions. Air quality would only be affected by future trends and actions described in **Section 3.2.1.1** above.

Proposed Action

Construction

Construction activities from the Proposed Action would produce air pollutant emissions from construction equipment exhaust, exhaust from employee and delivery vehicles, and fugitive dust from soil disturbance and travel on unpaved roads. Construction emissions would be temporary and would have short-term air quality impacts only for the duration of the construction phase of the Project. The overall construction period is estimated to be approximately 12–18 months. The total pollutants emitted from the Project's construction would be much smaller than the total projected annual emissions for La Paz County (**Table 3-4**).

Table 3-4. Maximum Annual Criteria Pollutant Emissions for the Construction Phase

Emission Source Category		Maximum Construction 12-Month Emissions (tons/year)					
		PM_{10}	$PM_{2.5}$	NO_X	SO_2	CO	VOC
Exhaust from Construction Equipment	Civil and Road Construction	0.08	0.08	2.28	0.01	0.42	0.09
	Electrical Work, Station Construction	0.14	0.13	6.00	0.01	0.62	0.17
	Solar Array Assembly and Erection	0.06	0.06	2.84	0.01	0.28	0.08
	Project Clean Up	0.04	0.04	1.95	0	0.17	0.05
	Concrete batch plant	0.47	–	–	–	–	–
	Generators	0.21	–	2.96	0.19	0.64	–
Exhaust from Construction Worker Commuter Vehicles		0.01	0.01	0.08	0.02	6.54	0.04
Exhaust from Construction Material and Equipment Delivery Vehicles [1]		0.09	0.08	9.37	0.05	14.60	0.22

Emission Source Category	Maximum Construction 12-Month Emissions (tons/year)					
	PM_{10}	$PM_{2.5}$	NO_X	SO_2	CO	VOC
Fugitive Dust from Construction Vehicle Travel on Roads	3.92	0.98	–	–	–	–
Fugitive Dust from Earthmoving & General Construction Activities	65.00 [2]	–	–	–	–	–
Total Annual Construction Phase Emissions	**70.0**	**1.38**	**25.48**	**0.29**	**23.27**	**0.65**
ADEQ Permitting Thresholds	**15**	**10**	**40**	**40**	**100**	**40**
General Conformity Thresholds [3]	**100**	**100**	**100**	**100**	**100**	**100**
La Paz County EI Totals [4]	**4,138**	**692**	**3,639**	**11.2**	**22,512**	**41,164**
Percentage of La Paz County EI Totals	**1.69%**	**0.20%**	**0.70%**	**2.59%**	**0.10%**	**0.01%**

Notes:
1) To compare emissions with the La Paz County Emissions Inventory Total, exhaust from construction material and equipment delivery vehicles includes only those emissions that would occur in La Paz County.
2) Calculated fugitive dust emissions are controlled with a control efficiency of 80%. Fugitive dust emissions would be mitigated to the extent practicable through implementation of dust control measures outlined within the Fugitive Dust Control Plan.
3) Conformity does not apply because the Project is located in an area of attainment. General conformity de minimis thresholds are used here as a proxy for impacts to show there is no significant impact.
4) Data from the U.S. Environmental Protection Agency National Emissions Inventory (EPA 2020).
Key: **ADEQ** = Arizona Department of Environmental Quality; **CO** = carbon monoxide; **EI** = emissions inventory; **NOx** = oxides of nitrogen; **$PM_{2.5}$** = particulate matter 2.5 microns or less; **PM_{10}** = particulate matter 10 microns or less; **SO_2** = sulfur dioxide; **VOC** = volatile organic compounds

Operation and Maintenance

Operation and maintenance activities from the Proposed Action would produce air pollutant emissions from employee and maintenance vehicles' exhaust. The total pollutants emitted from Project operation would be much smaller than the total projected annual emissions for La Paz County (**Table 3-5**). Moreover, to the extent that solar energy generation displaces fossil fuel-based energy generation, there would likely be a net decrease in air pollutant emissions as operation of solar plants emits fewer air pollutants than the operation of fossil fuel plants.

Table 3-5. Maximum Annual Criteria Pollutant Emissions for the Operational Phase

Emission Source Category	Maximum Operational 12-Month Emissions (tons/year)					
	PM_{10}	$PM_{2.5}$	NO_X	SO_2	CO	VOC
Exhaust from Operation Worker Commuter Vehicles	<0.01	<0.01	<0.01	<0.01	0.13	<0.01
Exhaust from Maintenance / Inspection Activities	0.02	0.02	0.77	<0.01	0.05	0.02
Total Annual Operational Phase Emissions	**0.02**	**0.02**	**0.77**	**<0.01**	**0.18**	**0.02**
ADEQ Permitting Thresholds	**15**	**10**	**40**	**40**	**100**	**40**

Emission Source Category	Maximum Operational 12-Month Emissions (tons/year)					
	PM_{10}	$PM_{2.5}$	NO_X	SO_2	CO	VOC
La Paz County EI Totals [1]	**4,138**	**692**	**3,639**	**11.2**	**22,512**	**41,164**
Percentage of La Paz County EI Totals	**<0.01%**	**<0.01%**	**<0.01%**	**<0.01%**	**<0.01%**	**<0.01%**

Note: 1) U.S. Environmental Protection Agency's (EPA) National Emissions Inventory (EPA 2020).
Key: **ADEQ** = Arizona Department of Environmental Quality; **CO** = carbon monoxide; **EI** = emissions inventory; **NOx** = oxides of nitrogen; **$PM_{2.5}$** = particulate matter 2.5 microns or less; **PM_{10}** = particulate matter 10 microns or less; **SO_2** = sulfur dioxide; **VOC** = volatile organic compounds

Decommissioning

Decommissioning emissions would be similar to construction emissions. Fugitive dust emissions would result from the removal—rather than the installation—of equipment, fences, and buildings.

Action Alternative: Wash Avoidance

Air quality impacts under the Wash Avoidance Alternative would be similar to those identified for the Proposed Action.

Sub-Alternative Options 1 and 2

Impacts from either Option 1 or Option 2 would be of a similar nature to the Proposed Action as the width of the corridor would be consistent, but in Options 1 and 2 the corridor would be longer than the Proposed Action and would impact a larger area.

Cumulative Impacts

Six additional solar projects and a transmission line are either currently proposed or under construction within approximately 10 miles of the Project. Cumulative pollutant emissions in the region during construction of either Action Alternative would increase if other projects were constructed at the same time. However, construction of all reasonably foreseeable projects would probably occur at different times, so construction air pollutant emissions from different projects may not result in threshold exceedances. Increases in fugitive dust from disturbed soils would likely result if multiple projects were in construction at the same time. If multiple projects were undergoing construction-related soil disturbance, visibility on nearby roads including I-10 could be affected if adequate dust mitigation is not applied.

3.2.1.3 Mitigation

Impacts to air quality will be avoided, minimized, or otherwise addressed by application of the design features identified above in Section 2. The BLM has not identified additional mitigation measures beyond those design features.

3.2.2 GREENHOUSE GASES AND CLIMATE CHANGE

Construction equipment and vehicle exhaust during Project construction and operation activities would result in GHG emissions. Emissions would occur at some level over the duration of the Project with the majority occurring during the construction phase.

Issue:

- How would GHG emissions created during construction, operation, and decommissioning contribute to climate change?

The following impact indicators were used to analyze this issue:

- Project emission estimates in comparison to county emission inventories

Data sources evaluated in this analysis include the following:

- Jove Solar Project Air Quality Emissions Report (AZTEC Engineering 2022)
- EPA's National Emissions Inventory (EPA 2020)

Assumptions:

Emissions estimates for the Project were conducted using the applicable information and assumptions identified in **Section 3.2.1**.

3.2.2.1 Affected Environment

Background

GHGs occur naturally in the atmosphere. The greenhouse effect happens when GHGs collect in Earth's atmosphere. GHGs let sunlight shine onto Earth's surface, but they trap the heat that reflects up into the atmosphere like a greenhouse. Water vapor is the most abundant GHG, followed by carbon dioxide (CO_2), methane (CH_4), NOx, and fluorinated gases known as chlorofluorocarbons. Increases in GHGs can lead to changes in temperature and weather patterns.

Different GHGs can have different effects on the Earth's climate due to their ability to absorb energy and how long they stay in the atmosphere. The global warming potential (a measure of how much a gas warms the Earth) allows comparison of the global warming effects of different gases relative to CO_2. For any quantity and type of GHG, carbon dioxide equivalent (CO_2e) represents the amount of CO_2 that would have the equivalent global warming impact.

Besides naturally occurring GHGs, human activities can contribute to global warming. Most of the CO_2 from human activities comes from burning fossil fuels, such as oil, coal, and natural gas. Another way people cause increased CO_2 in the atmosphere is by cutting down forests. Living trees absorb CO_2, effectively removing it from the atmosphere, but decaying plant material emits CO_2.

Most human-caused CH_4 in the atmosphere comes from livestock farming, landfills, and fossil fuel production. NO_2 comes from agricultural technology and burning fossil fuels.

Chlorofluorocarbons come from their use in aerosol cans and refrigeration. All these human activities add GHG to the atmosphere, trapping more heat than usual and contributing to global warming.

Meteorology

Meteorology is the same as identified in **Section 3.2.1.1**.

Emission Inventory for La Paz County

The NEI is an annual estimate of emissions compiled from data collected from EPA, state, local, and Tribal Nations air agencies (see **Section 3.2.1.1** for additional information). For La Paz County, mobile emissions from the combustion of fuels in on-road motor vehicles and off-road equipment were the biggest contributors to CO_2e pollution (EPA 2020).

Trends and Actions

Human influence has caused widespread and rapid changes in the atmosphere, ocean, and land. Since 2011, GHG concentrations have continued to increase in the atmosphere. Annual averages of 410 parts per million for CO_2; 1,866 parts per billion for CH_4; and 332 parts per billion for N_2O were observed in 2019. Climate change is affecting many weather and climate extremes, such as heatwaves, heavy precipitation or droughts, and tropical cyclones in every region across the globe. Global surface temperature will continue to increase until at least midcentury under all emissions scenarios considered. Global warming will exceed 2 degrees Celsius (°C) during the twenty-first century unless deep reductions in CO_2 and other GHG emissions occur in the coming decades (Intergovernmental Panel on Climate Change 2021).

Existing primary sources of GHG near the Project area are vehicles traveling along I-10, cattle and other livestock, and occasional vehicle and OHV use of dirt roads The closest permitted source within the Project area is the El Paso Natural Gas Co – Wenden Compressor Station, 1 mile east of the Project. Compressor stations can be significant sources of CH_4 emitted during blowdowns when compressor units are depressurized for maintenance.

Future trends and actions near the Project area include industrial development and population growth focused near Tonopah, Arizona, which would increase mobile-source GHG emissions. There are several planned solar energy development projects and transmission line projects as discussed in **Table 3-2**.

3.2.2.2 Impacts

No Action

Under the No Action Alternative, the Project would not be developed. Existing land uses and activities in the area would continue. GHG emissions would only be affected by future trends and actions described in **Section 3.2.2.1**.

Proposed Action

Construction activities from the Proposed Action would produce GHG emissions from construction equipment exhaust and exhaust from employee and delivery vehicles. There are no established significance criteria for GHG emissions. GHG emissions for the construction phase of the Project would appear to be insignificant due to the small percentage of the La Paz County GHG emissions inventory that they represent (**Table 3-6**).

Table 3-6. Maximum Annual GHG Emissions for the Construction Phase

Emission Source Category		Maximum Construction 12-Month CO_2e Emissions (metric tons/year)
Exhaust from Construction Equipment	Civil and Road Construction	1,146.60
	Electrical Work, Station Construction	1,992.90
	Solar Array Assembly and Erection	924.90
	Project Clean Up	655.70
Exhaust from Construction Worker Commuter Vehicles		2,898.30
Exhaust from Construction Material and Equipment Delivery Vehicles [1]		6,825.10
Total Annual Construction Phase Emissions		**14,443**
La Paz County Emissions Inventory Total [2]		**699,854**
Percentage of La Paz County Emissions Inventory Total		**2.10%**

Notes:
1) To compare emissions with the La Paz County GHG Emissions Inventory Total, exhaust from construction material and equipment delivery vehicles includes only those emissions that would occur in La Paz County.
2) U.S. Environmental Protection Agency National Emissions Inventory (EPA 2020)
Key: **CO_2e** = carbon dioxide equivalent

Operational activities from the Proposed Action would produce GHG emissions from exhaust from employee and maintenance vehicles. The total pollutants emitted from Project construction would be much smaller than the total annual emissions for La Paz County (Table 3-7).

Table 3-7. Maximum Annual GHG Emissions for the Operational Phase

Emission Source Category	Maximum Operational 12-Month CO_2e Emissions (metric tons/year)
Exhaust from Operation Worker Commuter Vehicles	57.9
Exhaust from Maintenance / Inspection Activities	259.8
Total Annual Operational Phase Emissions	**317.7**
La Paz County EI Total [1]	**699,854**
Percentage of La Paz County EI Total	**<0.01%**

Note: 1) U.S. Environmental Protection Agency National Emissions Inventory (EPA 2020)
Key: **CO_2e** = carbon dioxide equivalent, < means "less than"

Decommissioning emissions are estimated to be less than construction emissions because fewer vehicles and equipment would be required to complete the work.

Project construction would result in minor GHG emissions over the life of the Project that would not significantly impact climate change or climate trends.

Action Alternative: Wash Avoidance

Climate change impacts under the Wash Avoidance Alternative would be similar to those identified for the Proposed Action.

Sub-Alternative Options 1 and 2

Impacts from either Option 1 or Option 2 would be of a similar nature to the Proposed Action as the width of the corridor would be consistent, but in Options 1 and 2 the corridor would be longer than the Proposed Action and would impact a larger area.

Cumulative Impacts

Cumulative GHG emissions in the region would increase during construction of the Project. GHG emissions would increase further if other projects were constructed at the same time. However, construction of all planned projects would probably occur at different times in which case construction GHG emissions from different projects may not be additive.

3.2.2.3 Mitigation

Impacts from GHG will be avoided, minimized, or otherwise addressed by application of the design features identified above in Section 2. In addition, GHG emissions would be minimized by the following mitigation measures:

- Use well-maintained equipment and ensure vehicles meet applicable emission performance standards.
- Use particulate filters and catalyst converters on equipment and vehicles.
- Use low sulfur diesel to power equipment and vehicles.
- Reduce equipment and vehicle idling time.
- Source local materials, when possible, to reduce transportation distances.

3.3 Biological Resources

The geographic analysis area for biological resources includes the Project footprint, which would experience temporary or permanent ground disturbance that may impact vegetation communities and soils stability, erosion, and watershed health (Jove Solar, LLC 2023), plus a buffer of sufficient distance to capture all project impacts. For certain special-status species, a buffer of 10 miles around the Project footprint in all directions was used. Where peer-reviewed literature exists supporting a different buffer, these buffers were applied. The temporal analysis of these resources includes the duration of the Project (30 years), plus 40 years to account for reestablishment of vegetation following decommissioning activities (Arabella 2009).

The following resources are analyzed in detail in this section:

- Vegetation and noxious weeds
- General wildlife
- T/E species (including Sonoran pronghorn)
- BLM sensitive species (including Sonoran Desert tortoise)
- Migratory birds

3.3.1 VEGETATION

Project construction, operation and maintenance, and decommissioning activities would result in direct impacts on vegetation through ground disturbance activities and shading. The geographic analysis area for this resource encompasses the 3,495 acres within the Project's boundary fence, and the activities described above have the potential to impact all vegetation within that fence. To account for Project effects which extend beyond the Project perimeter (such as dust which could impair photosynthesis, water spraying for dust suppression or soil compaction which could provide a moisture advantage nearby, etc.) impacts are inferred in an additional 0.25-mile buffer. The temporal analysis of this resource includes the duration of the Project, plus 40 years to account for reestablishment of vegetation following decommissioning activities (Arabella 2009).

Issues:

- How would ground-disturbing activities affect vegetation?
- How would construction, operation and maintenance, and decommissioning activities affect soil stability or soil aggregate stability, erosion, and watershed health?

The following impact indicators were used to analyze these issues:

- Occurrence/distribution of plant species
- Acres of ground disturbance and changes in surface permeability and surface water flow

Data sources evaluated in this analysis include the following:

- SW Regional Gap Analysis Landcover (Lowry et al. 2005)
- Natural Resources Conservation Service (NRCS) Web Soil Survey Data (NRCS 2023)
- Jove Solar Plan of Development (Jove Solar, LLC 2023)
- Jove Biological Resources Technical Report (AZTEC Engineering 2023a)
- Jove Solar Project Traffic Impact Analysis Report (AZTEC Engineering 2023b)
- Historic Wildfire Occurrence Data (National Interagency Fire Center 2023)

3.3.1.1 Affected Environment

Vegetation

The Project lies within the EPA Central Sonoran/Colorado Desert Basins Level IV Ecoregion (Griffith et al. 2014). The region is dominated by alluvial plains, fans, and bajadas that occur between desert mountain ranges. Elevations range from 1,325 feet to 1,420 feet above sea level (AZTEC Engineering 2023a). Temperatures in nearby Quartzsite, Arizona, reach an average

high of 108°F in July and an average low of 38°F in December (U.S. Climate Data 2023). Average annual rainfall is less than 5 inches (U.S. Climate Data 2023). The primary land use is open range livestock grazing.

All soils within the Project area are classified as "Fragile" by NRCS, are highly susceptible to erosion, and have a low capacity to recover from degradation (NRCS 2023). The primary factors include aridity, low levels of organic matter, and weak to poor soil aggregate structures. Surface disturbance and vegetation removal can decrease soil stability, increase erosion, and decrease watershed health.

The vegetation community in the region is almost entirely Sonoran-Mojave Creosote-White Bursage Desert Scrub with less than 1 percent each of Sonoran Paloverde-Mixed Cacti Scrub and North American Warm Desert Riparian Mesquite Bosque (Lowry et al. 2005). The Project area is mostly bare ground. Common plant species include creosote bush (*Larrea tridentata*), white bursage (*Ambrosia dumosa*), brittlebush (*Encelia farinosa*), ocotillo (*Fouquieria splendens*), foothill palo verde (*Parkinsonia microphylla*), ironwood (*Olneya tesota*), woolly plantain (*Plantago insularis*), and desert spiny herb (*Chorizanthe rigida*) (AZTEC Engineering 2023a). Velvet mesquite (*Prosopis velutina*) dominates the overstory across the western and central portions of the Project area with ironwood becoming dominant in the eastern portion (AZTEC Engineering 2023a). Fewer than five saguaro cacti (*Carnegiea gigantea*) occur (AZTEC Engineering 2023a).

No plants listed by the USFWS as threatened or endangered, or plants listed by the BLM as sensitive were detected during the 2022 survey (AZTEC Engineering 2023a), but eight species of Arizona protected native plants were identified. They are the saguaro cactus, fish-hook barrel cactus (*Ferocactus wislizenii)*, silver cholla (*Cylindropuntia echinocarpa*), diamond cholla (*Cylindropuntia ramosissima*), night-blooming cereus (*Peniocereus greggii*), Emory's crucifixion-thorn (*Castela emoryi*), velvet mesquite, and ironwood (AZTEC Engineering 2023a).

Noxious Weeds

No species included on the Arizona State Noxious Weeds List were observed during the field survey. Two non-native species (Mediterranean grass [*Schismus* spp.] and London rocket [*Sisymbrium irio*]) were detected in scattered, isolated patches (AZTEC Engineering 2023a). It is possible that additional non-native plants may be present within the Project area.

Trends and Actions

The Sonoran Desert ecosystem generally has low disturbance and high plant community stability. Invasive plants can threaten this ecosystem. Many of the non-native species that occur in the Sonoran Desert are winter annuals like Mediterranean grass, stinknet (*Oncosiphon piluliferum*) and Malta starthistle (*Centaurea melitensis*) or perennial grasses like buffelgrass (*Cenchrus ciliaris*). Once established in an area, non-native plants may expand during periods of high winter precipitation events such as those often related to the El Niño southern oscillation (Moloney et al. 2019).

Regional climate change projections for the southwest U.S. include increased average temperatures, increase variability in precipitation, seasonal changes in precipitation patterns, extended droughts, increased insect outbreaks, and increased wildfire risk (Garfin et al. 2014).

All are likely to alter the vegetation communities over time. Hantson et al. (2021) found significant decreases in vegetation cover in the Sonoran Desert during 1984–2017 and noted that these changes were correlated with changes in temperature and precipitation. The warming and drying within the Sonoran Desert and the shift to precipitation later in the year has led to a significant increase in winter annual plant species (Kimball et al. 2010).

Non-native species compete with native plants for water, nutrients, and space. They also affect disturbance regimes: non-native plants can increase susceptibility to wildfires that can further impact native vegetation.

3.3.1.2 Impacts

No Action

Under the No Action Alternative, trends and actions would occur as described under the affected environment. The Project would not be developed; and native vegetation communities, soil stability and erosion, and watershed health would only be affected by the trends and actions.

Proposed Action

Construction

The Proposed Action would result in the disturbance of soil and vegetation on up to 3,533 acres within the Project area. Soil and vegetation disturbance provides opportunities for the establishment of non-native plants. Vehicles can transport seed or propagules of non-native plants which could increase the fuels for potential wildfires and which could directly cause wildfires. Construction activities can also result in changes in the plant communities within and outside of the Project area, and decreased soil stability, increased erosion, and decreased watershed health within the Project area. Temporary disturbance areas would be revegetated following construction.

Operation and Maintenance

During operation and maintenance, traffic levels into the Project area would decrease significantly from the construction phase, but would remain approximately double preconstruction levels (AZTEC Engineering 2023b). Surface disturbance and potential wildfire ignitions from vehicle usage would continue with Project operation and maintenance.

Decommissioning

Decommissioning would have similar levels of surface disturbance and potential for wildfire ignitions, but it would culminate in revegetation with native plant species. Revegetation in arid systems like the Sonoran is difficult, and a successful outcome is dependent on both methodology and other factors that the Applicant cannot control such as weather and climate.

Action Alternative: Wash Avoidance

The Wash Avoidance Alternative would avoid construction within the desert wash that crosses the Project area generally from west–southwest to east–northeast, reducing ground disturbance and erosion, retaining native vegetation to support soil stability, and supporting watershed health.

Sub-Alternative Options 1 and 2

Impacts from either Option 1 or Option 2 would be of a similar nature to the Proposed Action as the width of the corridor would be consistent, but in Options 1 and 2 the corridor would be longer than the Proposed Action and would impact a larger area.

Cumulative Impacts

Other solar energy projects and a transmission line are proposed within 10 miles of the Project. The Project plus the additional projects may directly impact up to 38,213 acres along I-10. Those impacts may persist on the landscape for 40 years or more after the last project is decommissioned and revegetated.

These projects would result in a major loss of vegetation within the cumulative impacts analysis area. Nearly all effects would be on the Sonora-Mojave Creosote-White Bursage Desert Scrub plant community. However, these impacts represent a small percentage as there are nearly 1.4 million acres of this community within La Paz County, Arizona, and nearly 9.8 million acres within Arizona (Lowry et al. 2005). There are nearly 1.3 million acres of the Sonoran Paloverde-Mixed Cacti Desert Scrub community in La Paz County, and 9.9 million acres within Arizona.

Changes in non-native plants and wildfire potential could result in significant cumulative impacts. Disturbance within those vegetation communities has the potential to introduce non-native plants. These species may outcompete native plant species, increase fuel loading and fuel connectivity, and increase the occurrence and risk and scale of wildfires. Wildfires can result in a feedback cycle that increases non-native plants and additional wildfires that can ultimately result in the large-scale conversion of plant communities.

Non-native plants already occur in the Project area, and wildfires have already been recorded within 2 miles of the Project area. However, cumulative impacts from non-native plants and wildfire can be minimized in the design, operation and maintenance, and decommissioning of the Project and other projects within the vicinity through the implementation of BMPs such as those described under the Proposed Action.

3.3.1.3 Mitigation

Impacts to vegetation will be avoided, minimized, or otherwise addressed by application of the design features identified above in Section 2. The BLM has not identified additional mitigation measures beyond those design features.

3.3.2 GENERAL WILDLIFE

Project construction, operation and maintenance, and decommissioning activities would result in direct impacts on wildlife through ground disturbance activities resulting in the loss of habitat, exclusion of wildlife by fencing, potential avoidance of infrastructure by wildlife, and potential mortality from collision with infrastructure and traffic. The geographic analysis area for this issue encompasses the planned developments around the Project area and includes additional land within 4 miles representing the approximate diameter of a mule deer home range in the Sonoran Desert (Acala-Galvan and Krausman 2013).

Issues:

- How would construction, operation and maintenance, and decommissioning activities affect habitat availability, fragmentation, and/or exclusion from habitat from disturbance for wildlife?
- How would Project-related traffic increase the risk for direct mortality of wildlife?

The following impact indicators were used to analyze these issues:

- Changes in the occurrence or distribution of non-native plants
- Disturbance and/or loss of plant communities, food supplies, cover, breeding sites, and other wildlife habitat components necessary for ecosystem function
- Increases in vehicle traffic, presence of humans, and noise levels
- Changes in habitat use or mortality of wildlife

Data sources evaluated in this analysis include the following:

- Sources used for evaluating vegetation
- Jove Solar Project Traffic Impact Analysis Report (AZTEC Engineering 2023b).

3.3.2.1 Affected Environment

General Wildlife

General wildlife species, species of greatest conservation need, and species of economic and recreational importance that may occur within the Project area are detailed in the Biological Technical Report (AZTEC Engineering 2023a). The habitat within the Project area is currently fragmented only by two gravel roads and several smaller trails used by grazing permittees and the public for recreation.

Trends and Actions

There are no known population and distribution data for general wildlife within the Project area.

A description of the wildlife habitat based on the vegetation community can be found in **Section 3.3.1**.

Two improved gravel roads and several small tracks occur within the Project area that are used for maintenance of a pipeline, access by grazing permittees, and public recreation. Fragmentation sources in the vicinity include I-10, the Central Arizona Project (CAP) canal, several unimproved roads or tracks, and a few fallow agricultural fields east of the Project.

The effects of climate change and wildfire on vegetation were discussed in **Section 3.2.2.2**. The direct effects on wildlife of increasing temperatures and decreased precipitation are not documented for most species. Indirect climate change effects to wildlife could include increased presence of non-native plants which could result in habitat changes that would negatively affect breeding, feeding, sheltering, and thermoregulatory needs for native wildlife species occurring within the Project area and surroundings.

Infrequent human disturbances occur within the Project area, including livestock operations, vehicular traffic, and recreation activities such as hiking, camping, and hunting. Traffic data recorded going in and out of the vicinity from I-10 totaled seven vehicular trips in and out of the Project area in May of 2022 (AZTEC Engineering 2023b). OHV travel and soil disturbance from that travel has been documented within the Project area (AZTEC Engineering 2023a). There have been nine wildfire incidents in the general area between 2014 and 2023 that were all associated with roads, but none of the fires occurred within the Project area (National Interagency Fire Center 2023).

3.3.2.2 Impacts

No Action

Under the No Action Alternative, trends and actions would occur as described under the affected environment. The Project would not be developed; and the wildlife community would only be affected by those trends and actions.

Proposed Action

Construction

The Project would permanently disturb and fence up to 3,533 acres of wildlife habitat under the Proposed Action, reducing resources for wildlife and negatively impacting habitat connectivity for wildlife. Travel into the Project area would increase by 750 percent during construction (AZTEC Engineering 2023b). Construction activities would require a workforce of between 10 and 600 employees, and the resulting human disturbance would directly and indirectly affect local wildlife through avoidance of infrastructure and personnel and through potential collision mortality. Effects of human and vehicle disturbance during construction are temporary and limited to the duration of the activities. While some temporary disturbance areas would be revegetated following construction, habitat modification from the changes in vegetation and the installation of equipment and infrastructure would continue to affect wildlife during operation and maintenance of the Project through restoration. Soil and vegetation disturbance provides opportunities for the establishment of non-native plants. Increased vehicle traffic could transport seeds of non-native plants resulting in potentially increased fuels for wildfires and could directly

cause wildfire ignitions. These activities could result in changes in the plant communities within and outside of the Project area that may negatively affect habitat for wildlife.

Operation and Maintenance

During operation and maintenance activities under the Proposed Action, traffic levels into the Project area would decrease significantly but would remain approximately double preconstruction levels (AZTEC Engineering 2023b). Human disturbance would continue to affect wildlife during operation and maintenance. Disturbance and potential wildfire ignitions from vehicle usage would also continue within the Project area for operation and maintenance activities.

Decommissioning

Decommissioning activities under the Proposed Action would culminate in habitat restoration. Revegetation in arid systems like the Sonoran is difficult, and a successful outcome is dependent on both methodology and other factors that the Applicant cannot control, such as weather and climate.

Action Alternative: Wash Avoidance

The Wash Avoidance Alternative is the same as the Proposed Action but would avoid construction within the desert wash that crosses the Project area generally from west–southwest to east–northeast. This alternative would reduce ground disturbance within the wash, thereby retaining existing native vegetation to support habitat for wildlife and a potential corridor to allow the movement of wildlife through the Project area. Where compatible with National Electric Codes, the Wash Avoidance Alternative would include the installation of wildlife-friendly fencing specific to diverse types of wildlife to achieve permeability across sites. Specifically, fencing with larger holes to allow small and medium species to pass through. The northeastern terminus of the corridor ends just south of the CAP canal and I-10. There is no information on which species might use the potential habitat within the corridor or use the corridor to pass through the Project area. Outside of the no-build area, the Wash Avoidance Alternative retains all other direct and indirect effects on biological resources described in the Proposed Action.

Sub-Alternative Options 1 and 2

Impacts from either Option 1 or Option 2 would be of a similar nature to the Proposed Action as the width of the corridor would be consistent, but in Options 1 and 2 the corridor would be longer than the Proposed Action and would impact a larger area.

Cumulative Impacts

Other solar projects and a transmission line project are proposed in the area. The Project plus the additional proposed projects in the Project area may directly impact up to 38,213 acres along I-10 within a 10-mile radius. Most impacts would be within the Sonora-Mojave Creosote-White Bursage Desert Scrub plant community, which is the most common plant community in the Project vicinity and in La Paz County.

The loss of this habitat would adversely affect local wildlife through the loss of breeding, foraging, and sheltering habitat. The disturbance from these developments has the potential to increase non-native plants and the potential for wildfire. These developments would also increase human disturbance of wildlife and create additional barriers to movement between wildlife populations on either side of I-10.

3.3.2.3 Mitigation

Impacts to general wildlife will be avoided, minimized, or otherwise addressed by application of the design features identified above in Section 2. The BLM has not identified additional mitigation measures beyond those design features.

3.3.3 THREATENED AND ENDANGERED SPECIES

Project construction, operation and maintenance, and decommissioning activities would result in direct impacts on T/E species through ground disturbance activities resulting in the loss of habitat, exclusion of wildlife by fencing, potential avoidance of infrastructure by wildlife, and potential mortality from collision with infrastructure and traffic. The geographic analysis area and temporal analysis period for this issue are the same as they are for General Wildlife.

Issues:

- How would ground-disturbing activities increase the risk for establishment and spread of non-native plants, and how would those changes affect quality and quantity of existing habitat for T/E species?

- How would construction, operation, and decommissioning activities affect habitat availability, fragmentation, and/or exclusion from habitat disturb T/E species?

- How would increases in Project-related traffic increase the risk for direct mortality of T/E species?

The following impact indicators were used to analyze these issues:

- Increase in occurrence and distribution of non-native plants resulting in disturbance and/or loss of plant communities, food supplies, cover, breeding sites, and other T/E species habitat components necessary for ecosystem function, and resulting in changes in habitat use or mortality of T/E species.

- Disturbance and/or loss of native plant communities, food supplies, cover, breeding sites, and other T/E species habitat components necessary for ecosystem function and changes in habitat use or mortality of T/E species.

- Increases in vehicle traffic, human disturbance, and noise which may result in mortality of T/E species and changes in habitat use.

Data sources evaluated in this analysis include the following:

- The same sources as for General Wildlife.

3.3.3.1 Affected Environment

Threatened and Endangered Species

The USFWS has authority to protect species listed as T/E under the ESA. The monarch butterfly (*Danaus plexippus*) is a candidate for protection under the ESA that occurs anywhere that sufficient habitat exists (USFWS 2020). Milkweed (*Asclepias* spp.) is the monarch's obligate plant host that larvae feed on, but the extent of this plant in the Project site is unknown. Trees and shrubs serve as roosts that protect the monarch from rain, wind, cold, and heat (USFWS 2020). The species breeds in the low- to mid-altitude deserts in Arizona during August through October. Breeding has been documented in areas around the Project, including Phoenix, Yuma, and the Kofa Mountains (Morris et al. 2015). Monarchs also migrate across Arizona and are known to winter along the lower Colorado River (Morris et al. 2015).

The Federally endangered Yuma Ridgway's rail (*Rallus longirostris yumanensis*) occurs along the lower Colorado, Virgin, lower Gila, and the lower Salt Rivers in Arizona, California, Mexico, Nevada, and Utah (USFWS 2009). The species lives in freshwater marshes with dense cattails (*Typha* spp.) and bullrush (*Scirpus* spp.) with a mix of riparian tree and shrub species (USFWS 2009). These habitats do not occur within the Project area or nearby, but the species is included in this analysis because of the risk of collision mortality with solar panels when migrating between breeding and wintering locations.

The Sonoran pronghorn is the only federally listed species that is likely to occur within the Project area (AZTEC Engineering 2023a). In the western portion of its range, the species generally prefers the Sonora-Mojave Creosote-White Bursage Desert Scrub vegetation type (USFWS 2016). The Project is within the area designated under the Sonoran Pronghorn Recovery Plan (USFWS 2016) for an experimental non-essential population. The BLM will conference with the USFWS to address potential impacts to the experimental non-essential population of Sonoran pronghorn.

Trends and Actions

Monarch Butterfly

The monarch butterfly occurs in 90 countries, islands, and island groups across the globe (USFWS 2020). In North America, the monarch is divided into two populations, eastern and western, and both populations have been declining steadily since the 1990s (USFWS 2020). While survey information outside of North America is lacking, the eastern North American population is thought to be the largest population globally; and the western population is believed to be one of the smallest (USFWS 2020). No monarch survey data or trend data exist for the Project area or for La Paz County.

Monarch butterflies are habitat generalists. They can use a wide variety of habitats that provide nectar, milkweed, and thermoregulatory cover. One of the common breeding season sources for nectar in the Sonoran Desert is velvet mesquite (USFWS 2020). Velvet mesquite has been documented within the Project area (AZTEC Engineering 2023a). Given their mobility, habitat fragmentation does not appear to be a significant threat to the monarch butterfly.

Monarch butterflies are dependent on flowering forbs, shrubs, and trees for nectar, and milkweed for reproduction. All monarch butterflies depend on precipitation and are affected by drought. Wildfire can result in direct mortality, temporary reductions in nectar availability, and destruction of roosting habitat. Invasive and exotic plants that establish after disturbance can outcompete native milkweed that monarch butterflies depend on for reproduction. Increased temperatures can be a cause of mortality for eggs, larvae, pupae, and adults (Morris et al. 2015, USFWS 2020).

The western monarch butterfly population has been monitored since 1997, when they were at an estimated 1.2 million individuals (USFWS 2020). This population has been declining since that monitoring began, but it has generally been estimated at 30,000–400,000 individuals per year. The population declined significantly in 2018–2020, but rebounded to nearly 250,000 individuals in 2021 (Xerces Society 2023)

The primary management action that may affect monarch butterflies within the Project area is managed livestock grazing. Low intensity grazing is not considered a significant threat to the species (Western Association of Fish and Wildlife Agencies 2019). However, a lack of obligate plant host availability may limit populations. Vehicle collision, pollutants, and pesticides are also all potential sources of mortality (USFWS 2020).

Yuma Ridgway's Rail

Survey data for Yuma Ridgway's rail from 1969–2008 were published in the draft recovery plan (USFWS 2009). This survey data has been continuously collected by USFWS through 2023, but the results have not been published (Shepherd, pers. comm. 2023). Over the last 20 years, Yuma Ridgway's rail numbers in the U.S. ranged from 338 to 890 individuals. Since 2019, U.S. populations have declined by approximately 50 percent. The Project lies between the lower Colorado and middle Gila River populations. Harrity and Conway (2020) documented seasonal migration of Yuma Ridgeway's rails from the Gila and Colorado Rivers to the western coast of Mexico and back. Stopover locations included dry desert uplands, agricultural fields, coastal wetlands, and irrigation canals.

The primary factors affecting Yuma Ridgway's rail habitat availability are precipitation and water withdrawal for agriculture and other human uses (USFWS 2009). Both are likely resulting in declining habitat for the species.

Sonoran Pronghorn

Sonoran pronghorn historically occurred across nearly all of southern Arizona, the southeastern corner of California, the northeastern corner of Baja del Norte, and a large portion of northwestern Sonora, Mexico (USFWS 2016). Since European settlement, populations in Arizona declined to around 100 animals by 1920 and reached a low estimate of 21 animals in 2002 (USFWS 2016). Captive breeding, reintroduction, and habitat conservation efforts have helped the Arizona populations rebound to a current estimated population of 450 (AZGFD 2023). A captive breeding program was established on Kofa National Wildlife Refuge in 2011 with the intent of establishing a new population in the Kofa sub-unit; and 72 animals were released by 2016 (USFWS 2016). In 2023, the Sonoran pronghorn population within the Kofa sub-unit was estimated at 212 animals (Fernandez, pers. comm. 2023). Habitat conservation efforts to support these reintroductions have focused on fence removal and creation of artificial

water sources (USFWS 2016). The Project lies within two miles of the northern boundary of the Kofa Sub-unit.

Livestock fences and roads fragment the habitat for Sonoran pronghorn (USFWS 2016). Fence removal and the addition of artificial water sources are common habitat improvement practices for the species. The Project contains livestock fences but does not include any water sources.

Increasing temperatures, changes in precipitation and drought severity, changes in access to water, reduction of forage quality, non-native plants, and altered fire regimes are all considered potential threats to the Sonoran pronghorn (USFWS 2016). Climate change and drought affect the entire range of the species but may affect forage quality at regional scales. The presence of non-native plants and fire are issues related to climate change, but both may affect habitat on local scales. Non-native plants have been documented within the Project area (AZTEC Engineering 2023a). Wildfire ignitions have been documented within a few miles of the Project area, but not within it (National Interagency Fire Center 2022).

Sonoran pronghorns are sensitive to human disturbance. They tend to be vigilant or run when exposed to vehicle traffic within 1 mile, and pedestrian traffic within 0.5 mile (USFWS 2020) They avoid roads (USFWS 2016). The Project contains roads, but traffic levels on those roads appear to be very low (AZTEC Engineering 2023b).

3.3.3.2 Impacts

No Action

Under the No Action Alternative, trends and actions would occur as described under the affected environment. The Project would not be developed; and T/E species would only be affected by those trends and actions.

Proposed Action

The effects of the Proposed Action on T/E species habitat are the same as those described for General Wildlife. The 3,533 acres that would be impacted represent potential habitat for monarch butterflies and Sonoran pronghorn, and potential stopover habitat for Yuma Ridgeway's rails. Additional effects may include mortality or loss of habitat for monarch butterflies due to pesticide usage, vehicle collision mortality for monarch butterflies, Yuma Ridgway's rails, and Sonoran pronghorn, and disturbance due to traffic and human activity for Sonoran pronghorn during operation and maintenance. In addition to the 3,533 acres that would be directly impacted for these species, an addition 18,241 acres (a miles-wide buffer around the Project footprint) may be impacted through disturbance of Sonoran pronghorn by vehicular traffic and other human activities.

Human disturbance affecting habitat use or nesting is not a relevant factor for Yuma Ridgway's rails within the Project area because the Project area does not contain habitat for the species. However, the removal of vegetation and replacement with solar panels could create the illusion of open water (that is, the "lake effect") for Yuma Ridgway's rails or other water birds. Yuma Ridgway's rails and other birds that attempt to land in the panel array may be injured or killed by collision with the panels (Kosciuch et al. 2020).

Action Alternative: Wash Avoidance

The effects of the Wash Avoidance Alternative would be the same as those discussed for the Proposed Action. The corridor created by the no-build area would leave native vegetation in place where it is most dense, providing potential breeding, foraging, and thermal cover in place for monarch butterflies. It could also act as a movement corridor for Sonoran pronghorn. However, there is no information available to determine the likelihood that Sonoran pronghorn would use the Wash Avoidance Alternative's no-build area in that way.

Sub-Alternative Options 1 and 2

Impacts from either Option 1 or Option 2 would be of a similar nature to the Proposed Action as the width of the corridor would be consistent, but in Options 1 and 2 the corridor would be longer than the Proposed Action and would impact a larger area.

Cumulative Impacts

The cumulative effects on vegetation, wildlife, and wildlife habitat are also discussed in **Section 3.3.1.2**.

Monarch butterfly. The Project and other proposed projects would directly impact up to 38,213 acres of potential habitat for monarch butterflies within a 10-mile radius. Monarchs are highly mobile and migratory. Therefore, these projects are unlikely to serve as a barrier to their movements. While these projects would impact potential habitat for the species, the monarch is also a habitat generalist that uses any type of habitat that includes nectar producing plants and milkweed. Pesticide use from the proposed projects may also cumulatively impact the species.

Yuma Ridgway's rail. The primary issue for Yuma Ridgway's rails is the potential for collision mortality during operation and maintenance. The combined area of solar arrays and other associated infrastructure between the Lower Colorado River and Gila River populations may appear as large wetlands to rails flying between these populations. Rails that attempt to land in an array may collide with the panels.

Sonoran pronghorn. The Project and other proposed projects would directly impact up to 38,213 acres of potential habitat for the Sonoran pronghorn and increase fragmentation of surrounding habitat for up to an estimated 70 years. While this area lies near the northern periphery of the historic range of the species, proposed projects would add barriers that further fragment habitat and limit pronghorn movement in addition to existing impacts from I-10 and the CAP canal. Only one CAP canal underpass exists in the Project vicinity. Sonoran pronghorn are also negatively impacted through disturbance from vehicular traffic and other human activities that occur within a mile of individuals. A one-mile buffer of the proposed projects accounts for an additional 234,502 acres of potential pronghorn habitat that may be impacted.

3.3.3.3 Mitigation

Impacts to monarch butterflies will be avoided, minimized, or otherwise addressed by application of the design features identified above in Section 2. The BLM has not identified additional mitigation measures beyond those design features.

Impacts to Yuma Ridgway's rails will be avoided, minimized, or otherwise addressed by application of the design features identified above in Section 2. In addition, because the potential for collision mortality for the Yuma Ridgeway's rail from the Project is unknown, the Project would implement systematic post-construction mortality monitoring, coordinate with the BLM and USFWS, and mitigate for any impacts as directed by the BLM and USFWS.

Impacts to Sonoran pronghorn will be avoided, minimized, or otherwise addressed by application of the design features identified above in Section 2. In addition, mitigation for impacts on Sonoran pronghorn or their habitat could include partnering with the BLM, AZGFD, and USFWS to help fund off-site habitat improvements, such as wildlife water development or fence removal.

3.3.4 BLM SENSITIVE SPECIES

Project construction, operation and maintenance, and decommissioning activities would result in direct impacts on BLM sensitive species through ground disturbance activities resulting in the loss of habitat, exclusion of wildlife by fencing, potential avoidance of infrastructure by wildlife, and potential mortality from collision with infrastructure and traffic. The geographic analysis area and temporal analysis period for this issue are the same as for General Wildlife. The geographic analysis area for this issue includes the Project area plus a buffer of 0.25 mile beyond the Project boundary in all directions. This quarter-mile band represents the approximate diameter of an average Sonoran Desert tortoise's home range (Sullivan et al. 2016). The temporal analysis of this issue is the same as for General Wildlife.

Issues:

- How would ground-disturbing activities increase the risk for establishment and spread of non-native plants, and how would those changes affect the quality and quantity of habitat for BLM sensitive species, including for Sonoran Desert tortoise?

- How would construction, operation and maintenance, and decommissioning affect habitat availability, fragmentation, and/or exclusion from habitat cause disturbance to BLM sensitive species, including Sonoran Desert tortoise?

- How would Project-related traffic increase the risk for direct mortality of BLM sensitive species, including Sonoran Desert tortoise?

The following impact indicators were used to analyze these issues:

- Changes in the occurrence and distribution of non-native plants

- Disturbance and/or loss of plant communities, food supplies, cover, breeding sites, and other wildlife habitat components necessary for ecosystem function

- Increases in vehicular traffic, presence of humans, and noise

- Changes in habitat use or mortality of wildlife

Data sources evaluated in this analysis include the following:

- The same sources as for General Wildlife.

3.3.4.1 Affected Environment

BLM Sensitive Species

FLPMA requires the BLM to designate BLM sensitive species and implement measures to conserve these species and their habitats and to reduce the need for such species to be listed under the ESA. This list includes all Federally designated candidate species, proposed species, and delisted species for five years following delisting. Due to the overlap with other regulations such as the ESA, the Migratory Bird Treaty Act (MBTA) which protects all species of migratory bird, and the Bald and Golden Eagle Protection Act (BGEPA), BLM sensitive species covered under those Acts will be addressed in other sections of this EIS.

BLM sensitive species not included elsewhere are the California leaf-nosed bat (*Macrotus californicus*), the cave myotis (*Myotis velifer*), the greater western bonneted bat (*Eumops perotis californicus*), the pale Townsend's big-eared bat (*Corynorhinus townsendii pallescens*), and the spotted bat (*Euderma maculatum*).

All of these species roost in mines, caves and rock crevices, and the cave myotis will also occasionally roost under bridges and in buildings (AZTEC Engineering 2023a). Roost habitat such as caves and mines has not been recorded within the Project area but may occur outside the Project area (AZTEC Engineering 2023a). All local bat species forage for flying insects in desert scrub habitats, and all of these species are either non-migratory or are local migrants (NatureServe 2023a, 2023b, 2023c, 2023d, 2023e, 2023f).

The Sonoran Desert tortoise is a BLM sensitive species that was petitioned for listing under the ESA, but the USFWS in 2022 found listing was not warranted. The species typically inhabits rocky steep slopes and bajadas in the Sonoran Desert, but juveniles and some adults may use intermountain valleys for dispersal and as part of their home ranges (USFWS 2021). In lower elevations, incised washes provide critical burrowing sites and sheltering opportunities (USFWS 2021). Sonoran Desert tortoises are herbivores that have been documented to eat diverse herbaceous plants, grasses, woody plants, and cacti, but exotic grasses are thought to be less nutritious and pose a conservation concern for the species (USFWS 2021). Sonoran Desert tortoises may occur within the Project area, but sheltering habitat is not present and suitable burrows have not been observed within the Project (AZTEC Engineering 2023a).

Habitat loss and fragmentation for wildlife are discussed in **Section 3.3.2**. The Project may remove up to 3,533 acres of dispersal habitat for Sonoran Desert tortoise. The CAP canal and I-10 are located north of the Project. While there is one underpass on the CAP canal in the Project vicinity and multiple culverts under I-10, the canal and interstate likely significantly limit dispersal of tortoises across the valley to the Harquahala Mountains.

Non-native plants detected within the Project area are described in **Section 3.3.1.1**. In addition to potentially outcompeting native forage plants for tortoises, non-native plants can increase fuel loading and, subsequently, the size and intensity of wildfires (USFWS 2021). Wildfires could

result in a long-term decrease in food availability, thermal refugia, and cover for Sonoran Desert tortoises.

Trends and Actions

NatureServe lists the status of the California leaf-nosed bat as vulnerable due to human disturbance of caves and mines used as roost sites, renewed operation of previously closed mines, and improper closure of old mines (NatureServe 2023a). The distribution of the species in the U.S. includes Southern California, southern and western Arizona, and southern Nevada (NatureServe 2023a).

The status of the cave myotis is apparently secure and threats to the species include disturbance of caves and mines used as roosts, mine closures, renewed operation of old mines, and loss of foraging habitat (NatureServe 2023b). The range of the species in the U.S. extends from Kansas, Oklahoma, and Texas westward to California and Nevada.

The status of the greater bonneted bat is apparently secure, but foraging habitat loss has been documented as a threat to some localized populations (NatureServe 2023c). The range of this species covers Texas, Oklahoma, Arizona, Nevada, and California.

The pale Townsend's big-eared bat is considered a vulnerable subspecies (NatureServe 2023d). The U.S. range for this species includes all of the West Coast, Nevada, Arizona, New Mexico, Texas, Colorado, Oklahoma, and Kansas. Threats to the Townsends's big-eared bat include roost disturbance and destruction due to recreation and mining (NatureServe 2023e).

The status of the spotted bat is also considered to be apparently secure, and no major threats to the species have been documented (NatureServe 2023f). The species range includes all the western mountains, Great Basin, coastal states, Texas, and British Columbia.

See **Section 3.3.1** and **Section 3.3.2** for a description of the trends for the vegetation community and for wildlife habitat. The effect of increased non-native plants on these BLM sensitive species is largely unknown; however, large-scale conversion may negatively impact their insect prey. The diet of all these species includes primarily moths and beetles (NatureServe 2023a, 2023b, 2023c, 2023d, 2023e, 2023f).

The effects of climate change and wildfire on vegetation and wildlife habitat were discussed in **Sections 3.3.1** and **Section 3.3.2.** There is little information available on the effects of climate change and wildfire on bats. Shrublands used for foraging habitat could be converted to grasslands by wildfire. The insect community following such plant community conversion could also change.

The effects of human disturbance on vegetation and wildlife were discussed in **Section 3.3.1** and **Section 3.3.2**. Human disturbance of roost sites is a significant threat to all these BLM sensitive bat species (NatureServe 2023a, 2023b, 2023c, 2023d, 2023e, 2023f).

Collision with infrastructure is a potential source of human disturbance. Smallwood (2022) conducted a review of post-construction fatality monitoring reports on thermal and photovoltaic solar developments 1982–2018 and noted relatively low levels of bat mortality compared to

birds. But the study also identified multiple sources of error and bias in those reports that likely underestimate that mortality.

Artificial lighting is another potential source of human disturbance for bats. Disturbance from artificial lighting can result in a variety of effects on bats, including spatial avoidance and habitat fragmentation, increased or reduced foraging opportunities due to attraction of insects to light and/or avoidance of artificially lit areas by bats, delayed emergence from roosts when lights are placed near an entrance, spatial avoidance of roosts or roost abandonment, reduced reproductive success, and increased arousal from hibernation (Stone et al. 2015).

The range of the Sonoran Desert tortoise stretches from the Rio Sonora in Mexico, northwest to I-40 near Bullhead City, Arizona, and roughly from Nogales, Arizona, westward to the Colorado River (USFWS 2021). Populations on AZGFD and BLM long-term monitoring plots have been largely stable over the last 30 years, but some populations may be more at risk than others due to issues like non-native vegetation, wildfire, habitat fragmentation due to energy and transportation infrastructure, and climate change (USFWS 2021).

See **Section 3.3.1** and **Section 3.3.2** for a description of the trends for the vegetation community and for wildlife habitat. The loss and fragmentation of dispersal habitat for Sonoran Desert tortoises in the valleys may have long-term demographic effects through the isolation of populations (USFWS 2021). Isolation can result in genetic drift and inbreeding that can put individual populations at risk of local extinction. Expanding energy and infrastructure development are expected to increase isolation of individual populations. Existing sources of habitat fragmentation in the Project area include the CAP canal and I-10. Sonoran Desert tortoises have been documented to cross the CAP canal and highways using underpasses (Hamilton 2023). However, underpasses are rare in the Project Vicinity.

The effects of climate change and wildfire on vegetation and wildlife habitat were discussed in **Section 3.3.1.** and **Section 3.3.2**. Climate change and wildfire are significant threats to the Sonoran Desert tortoise. These two factors both affect the expansion of non-native plants that outcompete native forage species. Drought can negatively affect tortoise physiology, reproduction, and survivorship through both reduction of forage availability and water availability (USFWS 2021).

The effects of human disturbance on vegetation and wildlife were discussed in **Section 3.3.1.** and **Section 3.3.2**. Human disturbance can affect the Sonoran Desert tortoise through mortality from vehicles, illegal collection, fencing (for example, sheep fencing or chain-link security fences) that limits tortoise movement, and human-caused wildfires (USFWS 2021). Road killed carcasses, garbage, and vertical structures represent an indirect human disturbance as they tend to attract and subsidize ravens that may prey on tortoises (Boarman 2003).

3.3.4.2 Impacts

No Action

Under the No Action Alternative, trends and actions would occur as described under the affected environment. The Project would not be developed; and BLM sensitive species would only be affected by those trends and actions.

Proposed Action

The effects of the Proposed Action are the same as those described for General Wildlife. Additional effects may include construction vehicle collision mortality for BLM sensitive bat species and Sonoran Desert tortoises. Based on traffic estimates, the Project area currently receives little human visitation (AZTEC Engineering 2023b). Aside from the Proposed Action, there is little reason to expect human visitation of the Project area to change. Other effects may include habitat loss, and attraction to or avoidance of artificial lighting during the operation and maintenance phase. Additional effects for the Sonoran Desert tortoise may include indirect predation effects during the construction and operation and maintenance phases: if personnel or activities create subsidies for tortoise predators (such as artificial water sources) predators may have an increased presence because of the Project, and increase predation on tortoises.

Action Alternative: Wash Avoidance

The Wash Avoidance Alternative is the same as discussed under General Wildlife. The no-build area would leave native vegetation in place where it is most dense, providing potential foraging habitat for BLM sensitive bat species. This alternative would reduce ground disturbance within the desert wash, also retaining existing native vegetation to support habitat for wildlife and a potential corridor to allow the movement of wildlife, like the Sonoran Desert tortoise, through the Project area. There is no information available to determine the likelihood of tortoises using the corridor, however, and the northeastern terminus of the corridor ends just south of the CAP canal and I-10, which would limit further movement.

Sub-Alternative Options 1 and 2

Impacts from either Option 1 or Option 2 would be of a similar nature to the Proposed Action as the width of the corridor would be consistent, but in Options 1 and 2 the corridor would be longer than the Proposed Action and would impact a larger area.

Cumulative Impacts

The cumulative effects on vegetation, wildlife and wildlife habitat are discussed in **Section 3.3.1** and **Section 3.3.2**.

The Project and other proposed projects would directly impact up to 38,213 acres of potential foraging habitat for bats. However, foraging habitat is not generally considered to limiting bat populations unless it is close to roosting habitat. Roosting habitat may exist outside of the area of the proposed projects, in mines or caves in the rocky hills, mountains, and canyons. One of the common concerns for bats is the use of artificial lighting which may increase the effect of habitat loss through light avoidance.

The Project and other proposed projects would directly impact up to 38,213 acres of potential dispersal habitat for Sonoran Desert tortoise. However, that habitat already contains significant barriers to north–south dispersal with 1-10 and the CAP canal extending through valley.

3.3.4.3 Mitigation

Impacts to BLM Sensitive species will be avoided, minimized, or otherwise addressed by application of the design features identified above in Section 2. The BLM has not identified additional mitigation measures beyond those design features.

3.3.5 MIGRATORY BIRDS

Project construction, operation and maintenance, and decommissioning activities would result in direct impacts on migratory birds through ground disturbance activities resulting in the loss of habitat, potential avoidance of infrastructure by wildlife, and potential mortality from collision with infrastructure and traffic. The geographic analysis area for this issue includes the Project area plus a 100-foot area around the Project area in all directions, which reflects ADOT environmental Planning and Migratory Bird Guidance which restricts construction and maintenance activities within 100 feet of bird nests. The temporal analysis of this issue is the same as for General Wildlife.

Issues:

- How would ground-disturbing activities increase the risk for establishment and spread of non-native plants, and how would those changes affect quality and quantity of existing habitat for migratory and resident birds?
- How would construction and operation activities affect habitat availability, fragmentation, and/or exclusion from habitat from disturbance for migratory and resident birds?
- How would construction and operation activities potentially affect migratory and resident bird nesting and mortality?

The following impact indicators were used to analyze this issue:

- Changes in the occurrence or distribution of non-native plants
- Disturbance and/or loss of plant communities, food supplies, cover, breeding sites, and other wildlife habitat components necessary for ecosystem function
- Increases in vehicular traffic, presence of humans, and noise
- Changes in habitat use or mortality of wildlife

Data sources evaluated in this analysis include the following:

- The same sources as those evaluated for BLM Sensitive Species.

3.3.5.1 Affected Environment

Migratory Birds

This section includes all migratory native bird species that are protected under the MBTA, the bald eagle and golden eagle that are protected under the BGEPA and MBTA, and migratory birds that are considered BLM sensitive species.

The BGEPA protects bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*) and provides those species with additional protections not afforded by the MBTA. Golden eagles have a moderate probability of occurrence within the Project area, but bald eagles are unlikely to occur (AZTEC Engineering 2023a).

The regulatory basis for BLM sensitive species is discussed in **Section 3.3.4.** BLM sensitive bird species that are likely to occur within the Project area are the western burrowing owl (*Athene cunicularia hypugaea*), gilded flicker (*Colaptes chrysoides*), golden eagle, and LeConte's thrasher (*Toxostoma lecontei)* (AZTEC Engineering 2023a). The burrowing owl is found in grasslands, deserts, and agricultural lands; and it nests primarily in ground squirrel or prairie dog burrows. The gilded flicker and LeConte's thrasher both use desert scrub habitats. The golden eagle is primarily found in open prairie, deserts, or mountains, but nests on cliffs or large trees. Other migratory birds that occur within the Project are discussed in the Biological Resources Technical Report (AZTEC Engineering 2023a).

Trends and Actions

The population status of the burrowing owl varies throughout its range in North America, and primary threats to the species include habitat loss and fragmentation, campaigns against burrowing mammals, and pesticides, with vehicle collisions and predation being cited as minor threats (NatureServe 2023g). The burrowing owl is a year-round resident in Southern California, Arizona, New Mexico, and most of Texas and Florida; and it is a breeding season migrant across most of the western U.S. and southern Canadian prairies.

The population status of the gilded flicker is considered secure but is considered vulnerable within Arizona and critically imperiled in California and Nevada (NatureServe 2023h). The range of the species in the U.S. includes the three states; and threats to the species are listed as climate change, wildfire, and non-native plants.

The range of the golden eagle encompasses all North America, and its status is listed as secure (NatureServe 2023i). Threats to the species include pesticides, powerline electrocution, and collision with wind turbines.

The population status of LeConte's thrasher is considered apparently secure but is locally considered vulnerable in Arizona (NatureServe 2023j). Primary threats to the species include habitat loss and fragmentation, loss of shrubs due to wildfire, overgrazing, and habitat degradation by OHV traffic.

See **Section 3.3.1** and **Section 3.3.2** for a description of the trends for the vegetative community and for wildlife habitat.

The effects of climate change and wildfire on vegetation and wildlife habitat are discussed in **Section 3.3.1** and **Section 3.3.2.**

Climate change, droughts, and wildfire have the potential to impact nesting and sheltering habitat, forage resources including the timing of insect hatches, and migration patterns and timing for migratory birds.

The effects of human disturbance on vegetation and wildlife were discussed in **Section 3.3.1** and **Section 3.3.2**. Direct human disturbance of migratory birds is primarily focused on disturbance and destruction of nests and can occur from a variety of actions, including OHV travel, vegetation management (for example, mowing and grading), wildfire ignition, and other activities. Based on traffic estimates, the Project area experiences infrequent vehicle traffic (AZTEC Engineering 2023b). Additional forms of human disturbance can include artificial lighting, which can affect migratory bird migration, habitat use, or the potential for collision mortality as described for the Yuma Ridgway's rail.

3.3.5.2 Impacts

No Action

Under the No Action Alternative, trends and actions would occur as described under the affected environment. The Project would not be developed; and migratory birds would only be affected by those trends and actions.

Proposed Action

The effects of the Proposed Action are the same as those described for General Wildlife including habitat loss, mortality from construction vehicles and for some birds, collision with Project structures, and construction noise and other human disturbance. Solar development can create sources of bird mortality from collision with panels, fencing, and powerlines (Kosciuch et al. 2020). Additionally, human disturbance has the potential to disturb or destroy migratory bird nests during the construction, operation and maintenance, and decommissioning phases.

Action Alternative: Wash Avoidance

The Wash Avoidance Alternative is the same as discussed for General Wildlife.

Sub-Alternative Options 1 and 2

Impacts from either Option 1 or Option 2 would be of a similar nature to the Proposed Action as the width of the corridor would be consistent, but in Options 1 and 2 the corridor would be longer than the Proposed Action and would impact a larger area.

Cumulative Impacts

The cumulative effects on vegetation, wildlife and wildlife habitat are discussed in **Section 3.3.1** and **Section 3.3.2.**

The Project and other proposed projects would directly impact up to 38,213 acres of potential foraging and nesting habitat for migratory birds. Primary concerns include nest disturbance and destruction, the use of artificial lighting that may affect bird migration and habitat use, and the potential for collision mortality with panel arrays.

3.3.5.3 Mitigation

Impacts to migratory birds will be avoided, minimized, or otherwise addressed by application of the design features identified above in Section 2. The BLM has not identified additional mitigation measures beyond those design features.

3.4 Cultural Resources and Native American Religious Concerns

Project construction, operation and maintenance, and decommissioning activities could result in impacts to cultural resources and Native American religious concerns. Impacts could be caused by construction equipment and activities, especially ground disturbance, earthmoving activities, and vehicle travel. Impacts could also be caused by changes to the visual setting and character, and from the introduction of electromagnetic fields. Impacts would occur at some level over the duration of the Project with the majority occurring during the construction and decommissioning phases.

A Class I Literature Review and a Class III intensive field survey were conducted to identify cultural resources in the Project area. These resources were identified as those that the Project could potentially affect because of their sensitivity to visual and landscape level changes that would be caused by the Project. Government-to-government consultation and consultation under Section 106 of the NHPA are ongoing to further identify cultural resources and additional areas of concern. Information about areas of specific tribal concern has been and will continue to be identified during government-to-government consultation and considered during the evaluation and assessment of effects under the NHPA and NEPA.

3.4.1 CULTURAL RESOURCES

Cultural resources include archaeological sites, historic buildings and structures, trails, roads, infrastructure, and other places of traditional, cultural, or religious importance that represent the physical aspects of the activities of past or present cultures. Cultural resources can be human-made or natural features and are, for the most part, unique, finite, and nonrenewable. Cultural resources are identified through field survey, historic documentation, or other sources such as oral history.

The geographic analysis area for impacts to cultural resources is the Project footprint, proposed utility easements on La Paz County and ASLD land to the Cielo Azul switching station, plus a 1-mile buffer around the Project footprint for consideration of indirect effects. The temporal analysis includes construction, operation and maintenance, through decommissioning and restoration.

The area of potential effects (APE) under Section 106 of the NHPA differs from the NEPA geographical analysis area. The APE is based on consultation with the Tribes and encompasses a large area to capture all concerns. The APE includes both direct and indirect effects and has been defined through consultation as approximately 53,000 acres of the westernmost extent of the

Harquahala Valley. The APE generally includes all land bounded by the Little Harquahala Mountains to the west and north, Lone Mountain at the northeast, and the Eagletail Mountains to the south.

The BLM is developing and consulting on a Memorandum of Agreement (MOA) to address potential effects to historic properties. The MOA will address effects of the Project on cultural resources and consider alternatives to address the effects of any historic properties by avoidance, minimization, or mitigation. When implemented, the MOA will address cultural resource identification efforts and assessment of effects that cannot be fully determined prior to approval of the undertaking (36 CFR 800.14(b)(1)(ii)). The MOA lays out a path for how potential impacts to cultural resources and Native American concerns would be addressed. In coordination with the NEPA review (36 CFR 800.8), execution of the MOA will complete the NHPA Section 106 process, meeting both the requirements of NEPA and NHPA Section 106 (36 CFR 800.2(d)(3)).

Issues:

The following issues, identified during scoping (**Section 1.7.3**), were considered during analysis of effects to cultural resources:

- How would driving over and crushing vegetation and other actions that disrupt surface soils impact cultural resources?
- How would excavation affect cultural resources and their distributions on the surface?
- How would subsurface modifications affect buried cultural resources?
- How would overland travel impact cultural resources within the APE?
- How would geotechnical excavation, such as boring, affect any possible subsurface cultural resources?
- How would the backfilling of soils from various excavations affect the location and context of cultural resources?
- How would Project fencing impact cultural resources?
- How would operation and maintenance impact cultural resources?

The following impact indicators were used to analyze this issue:

- Ground disturbance/disrupting surface soils
- Trampling
- Excavation, temporary stockpiling, transport, and backfilling soils
- Heavy machinery use
- Geotechnical boring
- Fencing
- Permanent impact areas

Data sources evaluated in this analysis include the following:

- Jove Cultural Technical Report (AZTEC Engineering 2022)
- Jove Solar POD (Jove Solar, LLC 2023)

3.4.1.1 Affected Environment

During the archaeological survey, 30 cultural resources and 218 isolated occurrences were recorded (AZTEC Engineering 2022). The isolated occurrences do not possess historic significance under the National Register of Historic Places (NRHP) criteria and are not eligible for the NRHP. The BLM is working to complete NRHP eligibility determinations for the remaining cultural resources.

The 30 cultural resource sites include 11 prehistoric artifact scatters, 18 historic sites consisting of mining-related features and artifacts, and one abandoned historic road. Of the 30 cultural resources, seven may be recommended as eligible for listing on the NRHP (**Table 3-8**). One cultural resource, the Palomas-Harquahala Road, has been recommended eligible, but the segment within the APE has been recommended to be non-contributing due to lack of integrity. Therefore, six cultural resources within the APE may be recommended as eligible for the NRHP.

Table 3-8. NRHP-Eligible Cultural Resources within the Area of Potential Effect

Site Type	Preliminary Recommended NRHP Determination*	Within Disturbance Footprint
Prehistoric Artifact Scatter	Eligible, Criterion D	Yes
Prehistoric Artifact Scatter	Eligible, Criterion D	Yes
Prehistoric Artifact Scatter	Eligible, Criterion D	Yes
Prehistoric Artifact Scatter	Eligible, Criterion D	Yes
Palomas-Harquahala Road	Eligible, Criterion A; segment within APE non-contributing	Yes
Prehistoric Artifact Scatter	Eligible, Criterion D	No
Prehistoric Artifact Scatter	Eligible, Criterion D	Yes

*Consultation on NRHP eligibility determinations with SHPO and Tribes is ongoing.

Trends and Actions

Cultural resources are affected by local climatic and weather events. These include wind erosion leading to site deflation where soils are eroded by wind, which collapses different archaeological components that were in distinct vertical contexts into a single layer. Cultural resources are also affected by runoff from monsoonal rain events, which can wash away ephemeral components of cultural sites that often characterize past human occupation and use of desert environments.

3.4.1.2 Impacts

Potential impacts were assessed for all cultural resources that could be impacted by the Project. The NRHP criteria were used to evaluate effects on historic properties and properties recommended eligible for the NRHP within the Project's APE.

With the Action Alternatives, unprotected cultural resources and vegetation could be driven over and crushed by heavy machinery, resulting in trampling and disturbance of subsurface deposits and potentially resulting in the destruction and diffusion of cultural resources. The disturbances may also increase erosion over sensitive areas.

Gravel would be imported where needed for road improvements, possibly burying cultural resources. There is a possibility for encountering subsurface cultural deposits during trenching and excavation if heavy machinery is used.

Geotechnical boring would be conducted in several locations; impacts from boring would be discrete and limited to the boreholes. Following completion of any excavation, the excavated soils would be backfilled, which would create patches of disturbed soils with new context. Possible surface artifacts adjacent to backfill may be inadvertently buried, removing them from possible context. No boreholes would be permitted within a historic property (that is, an NRHP-eligible site) boundary.

Holes created for fence posts may encounter buried cultural deposits.

Cultural resources that are intact following construction could later be disturbed by operations and maintenance, or decommissioning. (New discoveries would be addressed by protocols in the Monitoring and Discovery Plan [MDP] and Historic Properties Management Plan.)

Access roads would be continuously maintained during operation and maintenance. Unprotected cultural resources adjacent to access roads could be inadvertently affected.

Cultural resources preserved within the fenced area could be protected by the elevated security.

No Action

Under the No Action Alternative, impacts related to current trends and actions would continue to occur as described under the affected environment. There would be no effect to cultural resources from the Project.

Proposed Action

Under the Proposed Action, six NRHP-eligible cultural resources (five artifact scatters and a segment of a historic road, **Table 3-8**) could be impacted by physical disturbance during construction, operation and maintenance, and decommissioning. The Palomas-Harquahala Road segment may be disturbed or destroyed; however, it is a non-contributing portion of the site due to the segment's lack of integrity and inability to convey its significance. No further preservation or mitigation efforts would be necessary for this segment of the Palomas-Harquahala Road.

An MOA would be developed to establish protocols and measures to resolve the adverse effects of the Project on the historic properties through avoidance, minimization, and mitigation. Historic properties would be protected through signage and fencing throughout the life of the Project. Additionally, a collaborative study with consulting Tribes would be conducted to address Tribal cultural resource concerns.

The MOA, once finalized, would impose the following or similar measures to avoid or reduce impacts on the six NRHP-eligible prehistoric artifact scatters.

Preconstruction

- Development of a Historic Property Treatment Plan to outline how adverse impacts on NRHP-eligible cultural resources (historic properties) would be avoided, minimized, or mitigated.
- Development of an Historic Properties Management Plan to outline management of NRHP-eligible cultural resources (historic properties) during construction, operation and maintenance, and decommissioning.
- Development of an MDP to monitor known cultural resources and allow for the assessment and management of resources that are revealed via natural and Project-related depositional and erosional processes during the Project.
- Development of a cultural resources worker environmental awareness program (WEAP) to promote cultural resources identification and lawful and appropriate responses to discoveries.
- Development of a Tribal Participation Plan to guide Tribal monitoring during ground disturbing activities of the Project.

Construction

- Provide all construction personnel with WEAP Training.
- Conduct archaeological monitoring during all ground-disturbing construction activities, with results reported to the BLM.

Under both Action Alternatives, a loss of cultural resources that are not NRHP-eligible would occur.

Action Alternative: Wash Avoidance

The Wash Avoidance Alternative would avoid all NRHP-eligible cultural resources, except the non-contributing segment of the Palomas-Harquahala Road. This alternative would result in no adverse effect to NRHP-eligible cultural resources. Development of the WEAP and MDP would promote awareness, protection, and monitoring of known historic properties and allow for the assessment and management of unanticipated discoveries.

Under both Action Alternatives, a loss of cultural resources that are not NRHP-eligible would occur.

Sub-Alternative Options 1 and 2

Impacts from either Option 1 or Option 2 would be similar but across a larger area than those identified for the Proposed Action.

Cumulative Impacts

Six additional solar projects have been proposed; and the Ten West Link transmission line project, including the Cielo Azul Substation which the Project would connect to, is under construction within approximately 10 miles of the Project. Jove Solar and nearby projects may directly impact cultural resources that may be present on up to 38,165 acres. In addition to the solar projects, infrastructure such as area roads, I-10, and the CAP canal have altered or destroyed cultural resources in the area. Increased access in the form of foot and vehicle traffic to the area as a result of these projects could lead to looting and/or vandalism of cultural resources.

3.4.1.3 Mitigation

Impacts to cultural resources will be avoided, minimized, or otherwise addressed by application of the design features identified above in Section 2. The BLM has not identified additional mitigation measures beyond those design features.

3.4.2 NATIVE AMERICAN RELIGIOUS CONCERNS

The geographic analysis area for Native American religious concerns includes 3,495 acres of public lands administered by the BLM, 38 acres of La Paz County land, plus a buffer of approximately 1 mile surrounding the Project. The temporal analysis of this issue assumes that access to the resources in the area for Tribal Nations would be negotiated; however, access restrictions could occur starting at construction through decommissioning and restoration of the Project.

Because Native American tribes can be affected by the policies and actions of the BLM in managing the lands and resources under its jurisdiction, the BLM has a duty to consult with them on matters affecting their interests. Because of this government-to-government relationship, efforts to involve interested Tribal governments and to solicit their input regarding potential effects to cultural resources are ongoing. Executive Order (EO) 13175 provides guidance on consultation and coordination with Tribal governments. The Native American Graves Protection and Repatriation Act (25 USC 3001 et seq.) applies protections to Native American human remains, associated funerary objects, sacred objects, or objects of cultural patrimony where these are identified on Federal land. Other protections would apply for human remains (Native American or other) located on private or state land under Arizona laws (Arizona Revised Statutes Sections 41-844 and 41-865).

The American Indian Religious Freedom Act (42 USC 1996) provides protections to Native American resources of religious importance and access to religious sites on Federal land. EO 13007 (May 1996: Indian Sacred Sites) also applies to Native American sacred sites on Federal land and requires land managers—to the extent practicable, permitted by law, and not clearly inconsistent with essential agency functions—to 1) accommodate access to and ceremonial use of Native American sacred sites by Native American religious practitioners, and 2) avoid adversely affecting the physical integrity of such sacred sites.

Similar to the cultural resources APE, the APE for Native American religious concerns and Tribal resources encompasses 53,000 acres at the westernmost extent of the Harquahala Valley (which generally includes all land bounded by the Little Harquahala Mountains to the west and north), Lone Mountain at the northeast, and the Eagletail Mountains to the south to account for

visual impacts to Tribal cultural resources and places of concern. The APE is based on consultation with Tribes and encompasses a larger area to ensure all concerns are considered.

The following issues, identified during scoping (**Section 1.7.7**), were considered in the course of analyzing potential effects to Native American religious concerns.

Issues:

- How would the removal of vegetation impact the local Tribal Nations' use of the resources, their access to these resources, and their qualities?
- How would earthmoving projects, such as grading and excavations, affect the resources that Tribal Nations historically used within the area?
- How would discrete excavations, like boring, affect Tribal Nations' important resources in the subsurface?
- How would surrounding the facility with security fencing change Tribal access to resources?
- How would the facility itself impact the viewshed of the area from prominent places on the landscape, such as from Lone Mountain or the Eagletail Mountains?
- How would the construction of the facility and the fencing around the facility impact access to traditionally used landscapes?

The following impact indicators were used to analyze this issue:

- Vegetation removal and trampling
- Excavation, temporary stockpiling, transport, and backfilling of soils
- Geotechnical boring
- Fencing

The following elements of the Action Alternatives could impact Native American religious concerns and Tribal resources:

- Conversion of open desert for industrial usage, including the introduction of electrical generation equipment and transmission lines, may be a concern. During initial outreach with Tribal Nations, traditional land uses and cultural significance across the landscape were stated concerns.
- The most apparent impact would be the preparation of the Project area, including driving over and crushing vegetation and grading or recontouring.
- There would be small, localized borings to determine geophysical properties. Due to the limited area of disturbance and focus, only adjacent resources would be affected.

- Security fencing would restrict access to the public, including members of Tribal Nations who may have cultural affiliations to the landscape and resources of the area.

- The solar array would alter the viewshed from high points on the surrounding landscape, such as from Lone Mountain or the Eagletail Mountains.

Data sources evaluated in this analysis include the following:

- Jove Cultural Technical Report (AZTEC Engineering 2022)
- Jove Biological Resources Technical Report (AZTEC Engineering 2023a)
- Jove Solar Plan of Development (Jove Solar, LLC 2023)
- Jove Solar Project Visual Resources Technical Report (AZTEC Engineering 2023b).

3.4.2.1 Affected Environment

Human occupation in Arizona spans from approximately 10,000 BC to the present. The Project area is within the traditional lands of numerous Tribes. Historically, their lifeways were shaped by seasonal travel and resource harvesting and gathering. Access to and availability of natural resources has been crucial to the survival of Indigenous communities; and these resources still have a major role in the subsistence, culture, religion, and economy of the Tribes. Many places were visited during a yearly cycle of seasonal migrations to collect food, medicines, and other materials for sustenance, as well as for religious practices and social gatherings. The Tribes maintain an understanding of their histories that is complex and independent of Euro-American interpretations. Sixteen Tribal Nations have indicated that they have a connection to the Project area.

The analysis area for Native American religious concerns and Tribal resources is within a Sonoran Desert-scrub Biotic Community (AZTEC Engineering 2022), which has plant species that provide important food. Many of the other taxa may be economically important to Indigenous groups using the Project area today.

Trends and Actions

There are several existing trends that may impact the plant and animal communities currently found within the analysis area, including the presence of plant and animal species useful to Indigenous groups.

Plant Communities and Animal Species

Invasive plants have been documented in the analysis area. These include (but are not limited to) winter annuals like Mediterranean grass, stinknet and Malta starthistle, and perennial grasses like buffelgrass. Once established in the right conditions, these plants spread rapidly and crowd out native plant communities, including plants that have traditional values for Tribal Nations. This trend could result in the gradual reduction and disappearance of economically important native plant species.

General wildlife species that may occur within the Project area are detailed in the Biological Technical Report (AZTEC Engineering 2023a).

Climate Change and Natural Disturbance

Regional climate change projections for the southwestern U.S. include increased average temperatures, increased variability in precipitation and seasonal changes in precipitation patterns, extended droughts, increased insect outbreaks, and increased wildfire risk. All of these threaten the native plant regime, including economically important taxa, and wildlife habitat.

Human Disturbance and Fragmentation

The analysis area is currently used for livestock grazing and recreation that potentially includes activities like hunting and OHV use. Increased human use of the region where the Project is located has resulted in seven human-caused vegetation fires, and fire risk is increasing with climate change. Increased use and development can cause wildlife displacement and habitat fragmentation.

3.4.2.2 Impacts

No Action

Under the No Action Alternative, the Project would not be developed, and native plant, animal, and resource communities would only be affected by the trends and actions described above. There would be no Project-related impacts to Native American religious concerns or Tribal resources.

Proposed Action

The Proposed Action would result in the loss of the Project area as intact desert landscape and would result in any economically important plant and animal taxa being disturbed, displaced, or potentially destroyed. Additionally, vehicular travel would increase by more than 750 percent during construction and by 114 percent during operations (Jove Solar 2023). Potential indirect effects include establishment and expansion of invasive plants, increased potential for wildfire that may result in additional habitat loss, increased human disturbance, and increased vehicular mortality of wildlife, including rabbits and deer. Project fencing would be a barrier for both people and wildlife and would require alternate travel routes. The Proposed Action could adversely affect six NRHP-eligible prehistoric cultural resources unless these sites could be avoided by Project design (**Section 3.4.1.2**; AZTEC Engineering 2023a). Viewshed impacts to locations of Tribal concern may result depending on the location of Tribal use areas. In more distant, expansive views, the Proposed Action would result in weak contrast as it would be contained within the background zone (**Section 3.12.1.2**; AZTEC Engineering 2023b).

Action Alternative: Wash Avoidance

The Wash Avoidance Alternative is nearly the same as the Proposed Action but would avoid construction within the desert wash that crosses the Project from west to east. This alternative would reduce ground disturbance within the wash, retain existing native vegetation in the wash to support habitat for wildlife, and provide a potential corridor to allow the movement of wildlife through the Project area. The Wash Avoidance Alternative would have no adverse effects on the six NRHP-eligible prehistoric cultural resources as they would be avoided. Visual impacts would be similar to the Proposed Action.

Sub-Alternative Options 1 and 2

Impacts from either Option 1 or Option 2 would be similar but possibly spatially greater than those identified for the Proposed Action.

Cumulative Impacts

This Project is one of several proposed solar arrays in the region. The loss of 3,533 acres of desert landscape that this Project alone represents may not have an impact on the quality and integrity of the natural and cultural landscapes. However, six additional solar projects and a transmission line project are currently proposed or being constructed within approximately 10 miles of the Project. Additional impacts to Native American religious concerns may have occurred from construction of I-10, the CAP, roads and infrastructure, and other modifications to the natural landscape. Jove Solar and the additional projects in the action area may directly impact up to 38,165 acres along I-10.

Past, present, and reasonably foreseeable future projects would cumulatively result in the further degradation of the local cultural landscape as large areas of tribal resources are destroyed or disturbed. Quality habitat for important animal species would become fragmented, altering migration and travel corridors. These developments would also increase human presence and use within the analysis area, which can increase wildfire frequency and facilitate the spread of invasive plant species. The viewsheds of the area from high points on the landscape would be altered by the existence of the solar arrays and transmission line. Design Features (**Section 2.4.1**) would decrease the severity of these impacts, but not eliminate them. Associated resources could be permanently lost or altered.

3.4.2.3 Mitigation

Impacts to Native America religious concerns will be avoided, minimized, or otherwise addressed by application of the design features identified above in Section 2. The BLM has not identified additional mitigation measures beyond those design features.

3.5 Soil Resources

The geographic analysis area for soil resources includes the Project footprint, which would experience temporary and permanent impacts. The scope of the temporal analysis for this resource is permanent in the case of any imported soils; otherwise, impacts are only for the duration of the Project (30 years).

The following resource is analyzed in detail in this section:

- Soil Resources

The following resources are analyzed in brief in **Appendix B**.

- Mineral Resources and Mining
- Geohazards

3.5.1 SOIL RESOURCES

Issue:

- How would preconstruction and construction activities, operation and maintenance, and decommissioning and restoration impact soil stability, health, and productivity?

The following impact indicators were used to analyze this issue:

- Site preparation and excavation locations and acreages associated with permanent roads, buildings, substations (including a BESS), powerline footings
- Geotechnical excavation and boring locations and acreages
- Backfill or borrow material sources
- Permanent cleared areas
- Decommissioning and restoration borrow material sources

Data sources evaluated in this analysis include the following:

- Geology and Ground-Water Resources of the Harquahala Plains Area, Maricopa and Yuma Counties, Arizona (ASLD 1957)
- Hydrologic Map Series No. 01: Maps showing groundwater conditions in the Harquahala Plains Area, Maricopa and Yuma Counties, Arizona (ADWR 1980)
- Jove Solar Project Paleontological Resources Summary Report (AZTEC Engineering 2023)
- Plan of Development (Jove Solar, LLC 2023)

3.5.1.1 Affected Environment

The Project is located along the western edge of the Harquahala Plains area, also known as the Harquahala Valley. The Valley is the result of a downfaulted block forming a basin that has been filled by alluvial materials eroded from the nearby mountains (ASLD 1957). The alluvium in the region comprises clay, silt, sand, and gravel (ADWR 1980). Rock units in the area include Precambrian metamorphic and igneous, Paleozoic sedimentary, Cretaceous sedimentary, Cretaceous and Tertiary volcanic, and Tertiary intrusive (ASLD 1957). ADWR has documented land subsidence in the Harquahala Valley (ADWR 2022). There are five soil types in the Project area (**Table 3-9**).

Table 3-9. Soil Types in the Project Area.

Map Unit Name	Slopes	Description
Denure-Pahaka-Wellton Complex	0–3%	Well-drained to somewhat excessively drained soils formed from mixed fan alluvium on alluvial fans.
Gadsden-Glenbar Complex	0–5%	Well-drained soils formed from mixed stream alluvium on flood plains.
Gunsight-Rillito Complex	1–10%	Somewhat excessively drained soils formed from mixed fan alluviums on fans remnants.
Mohall-Contine Complex	1–5%	Well-drained soils formed from mixed alluvium on basin floors.

Map Unit Name	Slopes	Description
Wintersburg-Laveen Complex	0–3%	Well-drained to somewhat excessively drained soils formed from mixed fan alluvium on alluvial fans.

Source: Updated Final Jove Solar Project Paleontological Resources Summary Report (AZTEC Engineering 2023)

Current soil conditions at the Project site include scattered patches of biotic soil crusts and desert pavement that are scattered throughout the area (AZTEC Engineering 2023). The surface soils are undisturbed aside from occasional evidence of OHV travel and soil displacement caused by burrowing animals.

The Project is in La Paz County and is sited on a vacant, relatively flat land area, with no surface developments other than multiple local unimproved two-track roads. Soils in the area range from gravely sandy loam to silty clay loam with extremely channery loam near the Harquahala and Eagletail Mountains (Jove Solar, LLC 2023).

Trends and Actions

Soil resources would continue to be affected by climatic and weather events typical of desert environments, including wind erosion and runoff from monsoonal rain events.

3.5.1.2 Impacts

No Action

The No Action Alternative would have no impact on soils because ground disturbance and construction would not occur.

Under this alternative, trends and actions would occur as described under the affected environment. The Project would not be developed; and soil and existing vegetation would be affected only by those trends and actions.

Proposed Action

The Proposed Action would disturb approximately 70 percent of the analysis area, which would degrade some of the remaining intact soils and native seed banks. This would leave little intact soil in the analysis area. Of the two Action Alternatives, the Proposed Action would have the larger contribution to soil degradation and loss of sensitive soils because it would have the larger area of ground disturbance. Ground disturbance would impact soils through loss of vegetation, topsoil mixing, burial and compaction of soil crusts, soil horizon mixing, and seedbank disturbance. Interim reclamation would revegetate areas to a state as close to pre-Project conditions as possible, as defined by the Applicant's reclamation plan, with success criteria approved by the BLM. Soil impacts in temporary construction areas due to loss of vegetation and seed bank disturbance would be present for at least five years following reclamation—depending upon the success of restoration—though impacts from topsoil and soil horizon mixing may be permanent. Approximately 2,747 acres would be disturbed by Project infrastructure for the duration of the Project through decommissioning, and it would take up to 40 years following reclamation for native Sonoran Desert vegetation to reestablish (Arabella 2009).

The entire Project would include ground disturbance of 3,533 acres.

Action Alternative: Wash Avoidance

This alternative would reduce impacts to the soil and plant resources in the 145.8 acres of the "no-build" are in Section 32.

Sub-Alternative Options 1 and 2

Impacts from either Option 1 or Option 2 would be of a similar nature to the Proposed Action as the width of the corridor would be consistent, but in Options 1 and 2 the corridor would be longer than the Proposed Action and would impact a larger area.

Cumulative Impacts

When considering adjacent solar energy projects and existing projects in the area that would also use soil resources, the Project, in combination with trends and actions in the analysis area, would result in a cumulative impact to soil resources. However, the cumulative effects on soil resources across those projects are not expected to be substantial.

3.5.1.3 Mitigation

Impacts to soil resources will be avoided, minimized, or otherwise addressed by application of the design features identified above in Section 2. The BLM has not identified additional mitigation measures beyond those design features.

3.6 Public Health and Safety

The geographic analysis area for health and safety includes the Project footprint and all access routes that could be used by emergency services. The scope of the temporal analysis for this resource is the duration of the Project (30 years).

The following resource is analyzed in detail in this section:

- Health and Safety

3.6.1 HEALTH AND SAFETY

Issues:

- Would the Proposed Action or Action Alternatives change the risks of accidents or injuries to workers or public health and safety?
- Would the Proposed Action or Action Alternatives change the risks of unexploded ordnance (UXO) during construction or operation and maintenance?
- Would the Proposed Action or Action Alternatives change the risks of transmission line safety during construction or operation and maintenance?
- Would the Proposed Action or Action Alternatives change the risks of traffic and transportation safety for public health and safety providers during construction or operation and maintenance?

- How would the Proposed Action or Action Alternatives impact emergency responders that serve the Project vicinity?

The following impact indicators were used to analyze this issue:

- Proximity of the Project to sensitive receptors
- Construction equipment use
- Potential for Valley Fever
- Proximity to known and potential UXO
- Access routes and local routes in the area
- Proximity to emergency response facilities and providers
- Proximity to emergency response and evacuation routes

Data sources evaluated in this analysis include the following:

- Jove Solar Plan of Development (Jove Solar, LLC 2023)
- Arizona Department of Health Services (2023)
- Multi-Jurisdictional Hazard Mitigation Plan (La Paz County 2020)
- Formerly Used Defense Sites (USACE undated)
- Western Solar Plan (BLM 2012)

3.6.1.1 Affected Environment

Worker and Public Health and Safety

Worker occupational hazards associated with solar energy projects are relatively rare and can be minimized when workers adhere to safety standards. However, occupational hazards may include risk of injury from accidents (for example, trips, slips, or falls), improper equipment handling, risks from working at heights, fire and electrical risks, crane and hoist, biological hazards, chemical hazards, and exposure to heat or cold. Additionally, construction activities take place outdoors in remote locations and may be located far from emergency response providers.

Occupational Safety and Health Administration (OSHA) safety standards require construction employers to have accident prevention programs that provide for frequent and regular inspection of jobsites, materials, and equipment by competent persons designated by the employers (OSHA 2023).

Valley Fever

Valley Fever is an infection of the lungs caused by a fungus (*Coccidioides immitis* or *Coccidioides posadasii*) that grows in the soil in Arizona, the southern and central portions of California and portions of Nevada, New Mexico, Texas, Utah, and recently in south-central Washington, parts of Mexico, Central, and South America (Arizona Department of Health Services 2023). People infected with Valley Fever may develop symptoms such as cough, exhaustion, fever, rash, joint pain, muscle aches, and headaches for weeks or months. When soil is disturbed by activities such as digging, driving, or high winds, fungal spores can become airborne and can be inhaled. Project construction, operation and maintenance, and

decommissioning activities would be subject to dust control requirements to avoid exposing construction workers and the off-site population to substantial concentrations of dust.

Unexploded Ordnance

The Project is within the boundary of the Laguna Maneuver Area Formerly Used Defense Sites Property (Laguna Maneuver Area) (USACE undated). The former Laguna Maneuver Area was used from 1942–1944 as part of the California-Arizona Maneuver Area to train troops and test equipment for desert warfare. An area of the former Laguna Maneuver Area, known as the South Maneuver Area, was identified as having potential explosive hazards (USACE undated). The Military Munitions Response Program addresses sites that are known or suspected to contain UXO, discarded military munitions, or munitions constituents. The nearest response site within the Laguna Maneuver Area is approximately18.2 miles to the south. The United States Army Corps of Engineers (USACE) recommends that landowners and visitors follow the 3Rs of Explosives Safety: Recognize, Retreat, and Report (USACE 2023).

Emergency Response

Major transportation routes in La Paz County include I-10, U.S. Highway 60 (US-60), US-95, State Route (SR) 72, and SR-95. The Atchison Topeka and Santa Fe Railroad passes east–west through La Paz County parallel to US-60 and SR-72. There are no designated emergency evacuation routes in the Project area (La Paz County 2020). There are no fire departments, police stations, or hospitals within 10 miles of the Project. The Salome Emergency Airfield is approximately 0.80 mile north of the Project. (It is considered abandoned, but it can be used for an emergency.)

Trends and Actions

Existing public health and safety concerns within the vicinity of the Project area are potential inhalation of airborne soils contaminated with a fungus that could cause Valley Fever and the potential to come in contact with UXOs.

Future trends and actions near the Project include solar energy development and other industrial development near Tonopah, Arizona, that could lead to wind-driven soil erosion and exposure to Valley Fever from soil disturbance.

3.6.1.2 Impacts

No Action

Under the No Action Alternative, trends and actions would occur as described under the affected environment. The Project would not be developed; and public health and safety would only be affected by the trends and action.

Proposed Action

Worker and Public Health and Safety

All construction, operation and maintenance, and decommissioning personnel would be required to operate under a health and safety program approved by OSHA and the BLM's industry standards. Additionally, a health and safety plan would be developed with the final POD. Site

safety procedures would address a zero-injury safety policy; responsibilities and roles of personnel; health and safety for subcontractors; worker safety orientation and training; severe weather conditions; and accident/incident reporting procedures. The site safety procedures also outline employee safe work programs, including drug and alcohol policies, hazardous materials, fire protection, respirator use and maintenance, confined workspaces, and potential work hazards such as blood-borne pathogens, electrical hazards, and environmental dangers.

Prior to construction, the Applicant would conduct a safety assessment to identify potential safety issues and to develop measures that would be employed to mitigate them. The health and safety plan would be developed to protect workers and the public during Project construction. The Project would also implement a WEAP to communicate environmental issues, spill prevention and response measures, site-specific physical conditions for hazard prevention, and review of Project BMPs, the health and safety plan, the hazardous materials and waste management plan, and spill prevention and response plan. Implementation would improve understanding of requirements, enhance compliance, and minimize risks to worker health and safety during Project construction, operation and maintenance, and decommissioning.

Valley Fever

Implementation of dust control measures outlined in the Project's fugitive dust control plan would minimize the risk of exposure to Valley Fever for workers and the public during Project construction and decommissioning to a minor, short-term effect. If Valley Fever is thought to be a concern, the Project would contact the state/local health services for data reports of known Valley Fever fungus locations. If no data are available for the work area, the Project would test soils to conclude there is no risk or incorporate additional precautions to protect workers when projects are located in areas where the *Coccidioides* fungus is present. Worker protection measures and worker training specifically minimize exposures to this fungus. The Project would use approved methods and procedures to reduce the potential hazards from dust exposures to employees, and incorporate additional awareness of common symptoms and precautions to protect workers.

Unexploded Ordnance

Measures would be required to address the possibility of UXO. A BLM-approved plan would be developed before the onset of site mobilization or construction that includes assessment; training; and UXO recognition, retreat, and reporting procedures. With implementation of required plans and subsequent management actions, Design Features, and BMPs described as part of this Action Alternative, impacts would be negligible.

Traffic and Transportation

A traffic and transportation plan would be drafted to provide safety procedures and minimize impacts on traffic flow in the Project area. Traffic management procedures would be designed to minimize potential hazards from increased truck traffic and worker traffic and to minimize impacts to traffic flow in the Project area. With implementation of the Project's traffic and transportation plan, Project construction, operation and maintenance, and decommissioning would not affect traffic and transportation.

Emergency Response

Project construction, operation and maintenance, and decommissioning would not affect emergency response, evacuation routes, or emergency plans.

Summary

Because the Project site is currently little used and public access would be restricted during construction, the health and safety risks to the public are generally low. With implementation of the Design Features, impacts to public health and safety during construction, operation and maintenance, and decommissioning are expected to be negligible.

Action Alternative: Wash Avoidance

The effects would be the same as effects described under the Proposed Action.

Sub-Alternative Options 1 and 2

Impacts from either Option 1 or Option 2 would be of a similar nature to the Proposed Action as the width of the corridor would be consistent, but in Options 1 and 2 the corridor would be longer than the Proposed Action and would impact a larger area.

Cumulative Impacts

The geographic scope for cumulative analysis for public health and safety is within the 38,213-acre cumulative project area.

Proposed projects identified in **Section 3.1** could involve transport, use, storage, and disposal of hazardous materials. Additionally, cumulative impacts could result from nearby projects that could involve ground disturbance in areas where Valley Fever may occur. Cumulative impacts may occur if the Project and proposed projects are in the vicinity of each other and under construction at the same time. The Atlas North Project is adjacent to the Project, and Socorro Solar Project is within 5 miles of the Project and could occur simultaneously. However, implementation of mitigation to minimize impacts to hazardous material and waste and dust suppression to reduce potential exposure to Valley Fever would be required for all projects. Cumulative effects, therefore, would be negligible.

3.6.1.3 Mitigation

Impacts to public health and safety will be avoided, minimized, or otherwise addressed by application of the design features identified above in Section 2. The BLM has not identified additional mitigation measures beyond those design features.

3.7 Land Use

The geographic analysis area for land use resources includes the Project footprint plus affected BLM management areas, ROWs, designated utility corridors, and county land crossed by the Project or its alternatives, all of which would experience temporary and permanent impacts. The temporal analysis of effects is the duration of the Project (30 years) for permanent effects and the duration of construction for temporary effects.

The following resources are analyzed in detail in this section:

- Land use

3.7.1 LAND USE

Issues:

- How would the Proposed Action or Action Alternatives impact Federal or state land management and land use authorizations?
- How would the Proposed Action or Action Alternatives impact land use authorizations and designated utility corridors?
- How would the Proposed Action or Action Alternatives potentially conflict with applicable land use designations and management plans?
- How would the Proposed Action or Action Alternatives potentially conflict with existing and reasonably foreseeable land use authorizations?

The following impact indicators were used to analyze this issue:

- Assessment of land ownership and land use authorizations in the Project area
- Acres of Project by land ownership
- Designated utility corridors that cross the Project area
- Special Recreation Permit or ROW permit and ROW avoidance or exclusion areas crossed by the Project
- Consistency with local, state, and Federal land use plans

Data sources evaluated in this analysis include the following:

- Jove Solar Plan of Development (Jove Solar, LLC 2023)
- BLM Land and Mineral System Reports (BLM 2023)
- BLM AZ Grazing Pasture Map (BLM 2022)
- BLM Yuma RMP (BLM 2010)

3.7.1.1 Affected Environment

Land Use Designations

The Project would be located near several BLM Yuma RMP land use designations. The following land uses are present in the Project area: BLM land use authorizations including roads, pipelines, transmission lines, highway ROWs, cattle grazing permits, and dispersed recreation. Other uses include wildlife habitat; the Yuma RMP named 5 WHAs, the Colorado and Gila River Riparian, Desert Mountains, Dunes, and Wildlife Movement Corridors. The Project is almost entirely within the Palomas Plain WHA, and intersects approximately 27 acres of the Desert Mountains WHA. The 665,400-acre Kofa Wilderness and National Wildlife Refuge is located roughly 10 miles west–southwest of the Project and is managed by USFWS. The 24,600-acre New Water Mountains Wilderness is located adjacent to the north boundary of the Kofa National Wildlife Refuge. In addition, the northern boundary of the Eagletail Mountains Wilderness, which encompasses 97,880 acres, is approximately 2 miles to the south of the

Project. There are no BLM wilderness study areas (WSA) near the Project. The closest WSA is the Cactus Plain WSA, located approximately 45 miles northwest of the Project.

The 38 acres of the Project outside of BLM-administered public land in La Paz County are zoned Rural Agricultural (La Paz County 2012). The Rural Agricultural zoning is intended to apply to rural areas, on large parcels, for permanent dwellings with agricultural uses, and to support agricultural and open space uses. Regional utilities are also permitted, with prior approval of a conditional use permit in accordance with the La Paz County Zoning Code (La Paz County 2012).

Authorized Land Uses

The primary existing land use in the Project area is BLM-administered public land grazing, and other BLM-authorized and historical land uses include pipeline and highway ROWs, wildlife, and dispersed recreation.

The Project area intersects two BLM grazing allotments, the K Lazy B grazing allotment (AZ03047) and the Clem grazing allotment (AZ03017) that are administered by the BLM YFO and Lower Sonoran Field Office, respectively. The K Lazy B grazing allotment covers 145,165 acres of Federal, state, and private lands and is used year-long. The Clem grazing allotment covers 199,780 acres of Federal, state, and private lands. The BLM issued two-year notifications of lease cancellation and requests for waivers to the lessees on February 15, 2022.

Rights-of-Way

A variety of utilities are present in the Project area, including pipelines, buried cable lines, and access roads. Utilities that occur on BLM land are generally authorized under an ROW grant. Existing ROW utilities include:

- 51st Street with a 24-foot ROW
- AT&T Frontage Road with a 24-foot ROW
- El Paso Natural Gas multi-state pipeline with a 50-foot ROW
- Southwestern TelCo buried cable with a 10-foot ROW
- Two Arizona Public Service 12 kV ROWs with a 20-foot and a 15-foot width.

Trends and Actions

It is expected that public and private lands will continue to be considered for renewable energy development to meet the Arizona Renewable Portfolio Standard that requires 15 percent of energy produced in the state be from renewable sources by 2025.

3.7.1.2 Impacts

No Action

Under the No Action Alternative, trends and actions would occur as described under the affected environment. The Project would not be developed; and land use and realty would only be affected by trends and actions.

Proposed Action

The Proposed Action would be subject to land use approvals from applicable landowners and jurisdictions, including BLM and La Paz County. The Project area would span 3,495 acres administered by BLM and 38 acres of La Paz County land. Additional approvals may be required from the EPA, USFWS, Bureau of Reclamation, AZGFD, and ADEQ. The Project area is not located within any BLM special land use designations.

Because the Project would be located in a REDA designation in accordance with the RDEP ROD and within a variance area identified through the BLM Western Solar Plan, the Project would be located within an area with low known resource sensitivity. Further, as the Project is over 20 MW, it would be required to conform to the BLM RDEP Appendix B, Design Features, Required Plans, and BMPs. Compliance with the BLM RDEP Design Features and all conditions of approval for the BLM ROW grant would help ensure that the Project would not affect land use designations, and the Project would be consistent with the applicable plans and policies. Effects would be negligible.

Project areas outside of BLM-administered land in La Paz County are zoned Rural Agricultural (La Paz County 2012). The Rural Agricultural zoning district is intended to apply to rural areas, on large parcels, for permanent dwellings with agricultural uses, and to support agricultural and open space uses. With approval of the conditional use permit by La Paz County, the Project would be permitted and would not conflict with any land use plans, policies, or regulations. Authorized Land Uses

The development of currently natural or undeveloped land for a new solar facility and ancillary facilities would be a major change within the Project area. Existing authorized uses such as grazing and limited recreation activities would be precluded on approximately 3,495 acres during construction and operation. Grazing permittees would receive compensation for their contribution to grazing improvements.

Rights-of-Way

Implementation of the Project would not alter existing land ownership. Infrastructure would be sited to avoid impacting existing ROWs as necessary. Access to previously discussed ROWs may be temporarily affected during construction; however, the ROWs would not be precluded by construction. If access roads would cross existing underground utilities, the crossing sites would be designed to be protective of the underground utilities. If the Project is authorized, the Project would have to conform to the terms and conditions of other previously issued BLM ROWs in the Project footprint, if applicable. Coordination and outreach with existing authorized users would be completed for the Project to help ensure that the Project avoids impacts to existing uses. Other authorized land uses may experience minor displacement during construction; however, temporary use areas would be returned to their existing conditions in accordance with BLM requirements. Standard BLM authorizations for ROW grants, in accordance with Title V of the FLPMA, as amended, (43 USC 1761–1771) would apply for all portions of BLM-administered land that would be included in the Project. The Project has no direct effects to the authorized and pending ROWs identified. Impacts during decommissioning would be the same as those under construction. After decommissioning, other ROW uses would be able to resume.

Action Alternative: Wash Avoidance

The Wash Avoidance Alternative would avoid construction within the desert wash that crosses the Project from west–southwest to east–northeast. This would preserve the channel floodplain and maintain connectivity of comparatively high-value wildlife habitat and would avoid three known areas of environmental sensitivity. Otherwise, the Wash Avoidance Alternative proposes similar Project components within the same area as the Proposed Action, and all Design Features described for the Proposed Action would also be applied to the Wash Avoidance Alternative. The effects would be the same as effects described under the Proposed Action.

Sub-Alternative Options 1 and 2

Impacts from either Option 1 or Option 2 would be of a similar nature to the Proposed Action as the width of the corridor would be consistent, but in Options 1 and 2 the corridor would be longer than the Proposed Action and would impact a larger area.

Cumulative Impacts

The geographic scope of land use and realty cumulative impacts the 38,213-acre cumulative impacts area. Potential projects identified in **Section 3.1** that could contribute cumulatively to land use impacts are Atlas North, Socorro Solar, Alluvium, Bouse Solar, and Ranegras Plains Solar. Construction, operation and maintenance, and decommissioning of these projects could result in a cumulative effect on land use with other past, present, or reasonably foreseeable future actions, especially if—as development occurs—the rural environment would have increasingly more solar uses. The development of utility-scale solar projects in the Project area in combination with other past, ongoing, and foreseeable actions within the geographic extent could result in minor cumulative effects on land use through impacts on land use designations. However, the cumulative projects would involve BLM land and/or other Federal, state, or local land ROWs to allow construction and operation of each project. Reasonably foreseeable projects would need to comply with applicable land use policies intended to manage growth and maintain compatibility with neighboring land uses. The cumulative effects of past, present, and reasonably foreseeable projects to land use would be minor to moderate, although this Project would contribute only negligibly to this overall cumulative effect.

3.7.1.3 Mitigation

Impacts to land use will be avoided, minimized, or otherwise addressed by application of the design features identified above in Section 2. The BLM has not identified additional mitigation measures beyond those design features.

3.8 Livestock and Grazing Management

The geographic analysis area for livestock and grazing resources is the fenced Project footprint plus access roads. The scope of the temporal analysis for this resource is the duration of the Project (30 years).

The following resources are analyzed in detail in this section:

- Effects on native and non-native vegetation and rangeland health

- Effects on grazable acres and stocking rates
- Effects on access for grazing permittees and livestock
- Effects on non-native vegetation and rangeland health

3.8.1 LIVESTOCK AND GRAZING MANAGEMENT

Issue:

- How would ground-disturbing activities increase the risk for establishment and spread of non-native plants, and how would those changes in non-native plants affect rangeland health within affected allotments?

The following impact indicators were used to analyze this issue:

- Increase in occurrence or distribution of non-native plants resulting in a decrease in range condition

Data sources evaluated in this analysis include the following:

- SW Regional Gap Landcover (Lowry et al. 2005)
- Natural Resources Conservation Service Web Soil Survey Data (NRCS 2023)
- Jove Solar Plan of Development, February 2023 version (Jove Solar, LLC 2023)
- Jove Biological Resources Technical Report (AZTEC Engineering 2023a)
- BLM range permits (BLM 2021, 2022)

3.8.1.1 Affected Environment

Non-Native Vegetation and Rangeland Health

The Project area intersects two BLM grazing allotments: the K Lazy B permit, which underlies the majority of the Project area, and the Clem permit, which underlies the eastern tip only. The vegetation community in the region is almost entirely Sonoran-Mojave Creosote-White Bursage Desert Scrub with less than 1 percent each of Sonoran Paloverde-Mixed Cacti Scrub and North American Warm Desert Riparian Mesquite Bosque (Lowry et al. 2005). The Project is mostly bare ground. Common plant species include creosote bush (*Larrea tridentata*), white bursage (*Ambrosia dumosa*), brittlebush (*Encelia farinosa*), ocotillo (*Fouquieria splendens*), foothill palo verde (*Parkinsonia microphylla*), ironwood (*Olneya tesota*), woolly plantain (*Plantago insularis*), and desert spiny herb (*Chorizanthe rigida*) (AZTEC Engineering 2023a). Velvet mesquite (*Prosopis velutina*) dominates the overstory across the western and central portions of the Project area, with ironwood becoming dominant in the eastern portion (AZTEC Engineering 2023a). Fewer than five saguaro cacti (*Carnegiea gigantea*) occur (AZTEC Engineering 2023a). The Project would result in the disturbance or removal of vegetation on up to 3,495 acres of rangeland.

Trends and Actions

Changes in temperature and precipitation in the Sonoran Desert over the last five decades have led to decreases in vegetative cover (Hantson et al. 2021). These same trends have also led to

increases in non-native annual plants (Kimball et al. 2010). Forage production in the Sonoran Desert can be highly variable annually; however, NRCS (2023) published forage production figures in pounds per acre (**Table 3-10**).

Table 3-10. Forage Production by Soil Type

Soil Type	Forage Production (pounds per acre)		
	Unfavorable Year	Normal Year	Favorable Year
Denure-Pahaka-Wellton Complex	176	315	455
Gadsden-Glenbar complex	870	1090	1316
Gunsight-Rillito Complex	226	334	440
Mohall-Contine Complex	176	315	455
Wintersburg-Laveen Complex	176	315	455

Forage production for sites that have been impacted by non-native plants and wildfire remain in question, but the conversion to non-native plants results in the removal of woody vegetation and cacti, replacing them mostly with winter annuals. Conversion to non-native annual plants would result in a decrease in annual forage production and an even larger decrease in forage availability during the spring, summer, and fall periods when those annuals are dormant.

Regional climate change projections for the southwestern U.S. include increased average temperatures, increased variability in precipitation, seasonal changes in precipitation patterns, extended droughts, increased insect outbreaks, and increased wildfire risk (Garfin et al. 2014). The resulting changes in non-native plants and wildfire have the potential to extend well beyond the Project area and affect forage production and livestock grazing.

3.8.1.2 Impacts

No Action

Under the No Action Alternative, trends and actions would occur as described under the affected environment. The Project would not be developed; and the status of non-native plants and rangeland health would only be affected by trends and actions.

Proposed Action

Construction

Construction would result in the disturbance of soil and vegetation on up to 3,495 acres within the Project area. Soil and vegetation disturbance provides opportunities for the establishment of non-native plants. Increased vehicle traffic can transport seed or propagules of non-native plants and result in potential wildfire ignitions. These activities can result in changes in the plant communities, and decreased soil stability, increased erosion, and decreased rangeland health within the Project. Temporary impact areas would be revegetated following construction.

Operation and Maintenance

During operation and maintenance, traffic levels into the Project area would decrease significantly but would remain approximately double preconstruction levels (AZTEC

Engineering 2023b). Surface disturbance and potential wildfire ignitions from vehicle usage would continue within the Project for operation and maintenance activities.

Decommissioning

Decommissioning would have similar levels of surface disturbance and potential for wildfire ignitions but would culminate in revegetation with native plant species.

Action Alternative: Wash Avoidance

The Wash Avoidance Alternative would avoid construction within the desert wash that crosses the Project area generally from west–southwest to east–northeast, reducing ground disturbance and erosion, retaining native vegetation to support soil stability, and supporting rangeland health. The desert wash segment that is the subject of this Action Alternative is within the K Lazy B allotment.

Sub-Alternative Options 1 and 2

Impacts from either Option 1 or Option 2 would be of a similar nature to the Proposed Action as the width of the corridor would be consistent, but in Options 1 and 2 the corridor would be longer than the Proposed Action and would impact a larger area.

Cumulative Impacts

Six additional solar projects and a transmission line are currently proposed within approximately 10 miles of the Project. Jove Solar and the additional projects would negatively impact vegetation and rangeland health on up to 38,213 acres along I-10. Those impacts may persist on the landscape for up to 40 years after the last project is decommissioned and restored. These projects have the potential to increase non-native plants and the potential for wildfires in the region.

3.8.1.3 Mitigation

Impacts to livestock grazing will be avoided, minimized, or otherwise addressed by application of the design features identified above in Section 2. The BLM has not identified additional mitigation measures beyond those design features.

3.8.2 EFFECTS ON GRAZABLE ACRES AND STOCKING RATES

Issue:

- How would construction, operation and maintenance, and decommissioning activities affect grazable acres and stocking rates within the affected allotments?

The following impact indicator was used to analyze this issue:

- Ground disturbance and conversion resulting in a direct loss of grazable land

Data sources evaluated in this analysis include the following:

- Jove Solar Plan of Development (Jove Solar, LLC 2023)

- Jove Biological Resources Technical Report (AZTEC Engineering 2023a)
- BLM range allotment permits (BLM 2021, 2022)

3.8.2.1 Affected Environment

The Clem allotment totals 86,838 acres and is permitted for a total of 133 cattle and 1,085 animal unit months (AUMs) (BLM 2021). The K Lazy B allotment totals 144,861 acres and is permitted for a total of 157 cattle and 1,771 AUMs (BLM 2022). An AUM is the amount of forage necessary to sustain one cow or its equivalent for one month. For fee calculation purposes, an AUM is one month's use and occupancy of the range by one cow and her calf or its equivalent (that is, one bull, steer, heifer, horse, burro, or mule or five sheep or goats) that 1) are over the age of six months at the time of entering lands administered by the BLM; 2) are weaned regardless of age; or 3) will become 12 months of age during the authorized period of use.

The Project may impact up to approximately 300 acres or 0.35 percent of the Clem allotment and up to 3,195 acres or 2.2 percent of the K Lazy B allotment. AUMs are not consistent across a given allotment because certain portions may be more productive for forage and access to water resources varies. However, assuming forage and water are consistent across the allotments, the Project would impact approximately 3.8 AUMs on the Clem allotment and 39.5 AUMs on the K Lazy B allotment.

Trends and Actions

Grazable Acres and Stocking Rates

Grazing allotments, grazable acres within an allotment, and stocking rates for an allotment are determined by the BLM and are reviewed by the agency upon renewal of an allotment permit or at the discretion of the agency. Changes in land use can affect all three of these variables.

Climate Change and Natural Disturbance

Regional climate change projections for the southwestern U.S. include increased average temperatures, increased variability in precipitation, seasonal changes in precipitation patterns, extended droughts, increased insect outbreaks, and increased wildfire risk (Garfin et al. 2014). The resulting changes in forage productivity, non-native plants, and wildfire have the potential to affect grazable acres and stocking rates for an allotment.

3.8.2.2 Impacts

No Action

Under the No Action Alternative, trends and actions would occur as described under the affected environment. The Project would not be developed; and grazable acres and stocking rates would only be affected by those trends and actions.

Proposed Action

Construction

The Proposed Action would result in the fencing and suspension of up to 3,495 acres of public grazing lands within the Project area. The Project would impact 0.35 percent of the Clem

allotment and 2.2 percent of the K Lazy B allotment and has the potential to affect a total of approximately 43 AUMs. Through its effect on the presence of non-native plants and on wildfire, the Project has the potential to indirectly affect additional grazable acres and stocking rates on lands outside the Project area.

Operation and Maintenance

During operations and maintenance activities under the Proposed Action, the lands within the Project area would remain suspended from public grazing. Changes in non-native plants and wildfire from the Project have the potential to affect additional grazable acres and stocking rates on lands outside the Project area.

Decommissioning

Decommissioning activities under the Proposed Action would culminate in revegetation with native plant species. However, the lands within the Project area may not be released from suspension of grazing activities until those lands are deemed to be recovered by the BLM.

Action Alternative: Wash Avoidance

The Wash Avoidance Alternative would avoid construction within the desert wash that crosses the Project area generally from west–southwest to east–northeast, resulting in a minor increase in grazable acres for the K Lazy B allotment relative to the Proposed Action.

Sub-Alternative Options 1 and 2

Impacts from either Option 1 or Option 2 would be of a similar nature to the Proposed Action as the width of the corridor would be consistent, but in Options 1 and 2 the corridor would be longer than the Proposed Action and would impact a larger area.

Cumulative Impacts

The proposed energy projects near the Project would remove up to 38,213 acres from public grazing along I-10 in western Arizona. These impacts would reduce grazable acres and AUMs on multiple allotments. Additional indirect impacts related to the spread of non-native plants and wildfire could reduce AUMs on additional lands outside of the boundaries of these projects.

3.8.2.3 Mitigation

Impacts to grazeable acreage and stocking rates will be avoided, minimized, or otherwise addressed by application of the design features identified above in Section 2. The BLM has not identified additional mitigation measures beyond those design features.

3.8.3 EFFECTS ON ACCESS FOR GRAZING PERMITTEES AND LIVESTOCK

Issue:

- How would construction, operation, and decommissioning activities affect the access to water and grazing lands for the grazing permittee and their livestock?

The following impact indicator was used to analyze this issue:

- Reduction in land and water access and new fencing resulting from disturbance or conversion

Data sources evaluated in this analysis include the following:

- Jove Solar Plan of Development, February 2023 version (Jove Solar, LLC 2023)
- Jove Solar Traffic Impact Analysis Report (AZTEC Engineering 2023b)

3.8.3.1 Affected Environment

The Project boundary includes up to 3,495 acres that would have a chain-link security fence constructed around it (Jove Solar, LLC 2023). Public access through the Project area via the AT&T Frontage Road would be maintained (AZTEC Engineering 2023b).

Trends and Actions

Fences and Access

The Project is currently publicly accessible land that is accessed by AT&T Frontage Road from Hovatter Road and I-10, and 51 Street N runs east–west across the Project area (AZTEC Engineering 2023b). Multiple pasture fences occur within the Project area. No livestock water sites are contained within the Project area.

Future trends and actions within the Project area include continued grazing access and fencing with the potential for future solar energy development.

3.8.3.2 Impacts

No Action

Under the No Action Alternative, trends and actions would occur as described under the affected environment. The Project would not be developed; and access for grazing permittees and livestock would not be affected by the Project.

Proposed Action

Construction

The Proposed Action would result in the fencing and suspension of up to 3,495 acres of public grazing lands within the Project area. Public access, including access for grazing permittees, would be maintained outside of the Project area via the AT&T Frontage Road. Only the Project site would be fenced, and use of and access to other pastures and water sources would remain open.

Operation and Maintenance

During operation and maintenance activities under the Proposed Action, the lands within the Project area would remain suspended from public grazing. Public access outside the Project area,

including access for grazing permittees, would be maintained via the AT&T Frontage Road. No additional fencing or water access issues are expected for the grazing permittees.

Decommissioning

Decommissioning activities under the Proposed Action would culminate in revegetation with native plant species. However, the lands within the Project area may not be released from suspension of grazing access until those lands are deemed to be recovered by the BLM.

Action Alternative: Wash Avoidance

The Wash Avoidance Alternative would avoid construction within the desert wash that crosses the Project area generally from west–southwest to east–northeast on the K Lazy B allotment. Public access outside of the Project fence line would be maintained through the Project area via the AT&T Frontage Road. No additional fencing or water access issues are expected for the grazing permittees.

Sub-Alternative Options 1 and 2

Impacts from either Option 1 or Option 2 would be of a similar nature to the Proposed Action as the width of the corridor would be consistent, but in Options 1 and 2 the corridor would be longer than the Proposed Action and would impact a larger area.

Cumulative Impacts

The proposed energy projects in the Project area may remove up to 38,213 acres of grazing lands along I-10 in western Arizona. These developments have the potential to affect access to grazing lands and water on multiple allotments.

3.8.3.3 Mitigation

Impacts to grazing access will be avoided, minimized, or otherwise addressed by application of the design features identified above in Section 2. The BLM has not identified additional mitigation measures beyond those design features.

3.9 Paleontological Resources

The geographic analysis area for paleontological resources includes the Project footprint plus 1 mile around the Project footprint in all directions. The scope of the temporal analysis of this resource would be short-term for the duration of construction. If any paleontological resources were impacted during Project construction, those impacts would be considered permanent.

The following resources are analyzed in detail in this section:

- Paleontological resources

3.9.1 PALEONTOLOGICAL RESOURCES

Project construction has the potential to affect paleontological resources, from surface-disturbing activities that may affect resources if they are present at the surface (for example, vegetation removal, overland travel, security fencing) or subsurface (for example, excavation and grading,

geotechnical excavation and boring, sourcing backfill or borrow material). In addition to these direct effects, Project effects potentially include indirect future effects such as from increased erosion. Increased human presence, activity, and vehicle and foot traffic could impact these resources.

Increased human presence may also lead to increased incidents of theft or vandalism of fossil localities, should any be present.

Issues:

- How would the Proposed Action or Action Alternatives present potential direct effects to paleontological resources, such as during construction activities?
- How would the Proposed Action or Action Alternatives pose potential indirect effects to paleontological resources in the future, such as through increased erosion?
- How would human presence present potential adverse effects to paleontological resources?

The following impact indicators were used to analyze these issues:

- Estimated acreage for each Potential Fossil Yield Classification (PFYC) of the geologic units mapped in the Project area at the surface and anticipated to be present subsurface within range of Project activities
- Number of previously recorded fossil localities in or within 1 mile of the Project area

Data sources evaluated in this analysis include the following:

- PFYC mapping as compiled by the BLM (2022), based on geologic mapping by Hirschberg and Pitts (2000)
- Geologic mapping by Richard et al. (2023)
- Final Jove Solar Project Paleontological Resources Summary Report (AZTEC Engineering 2023) (and records search from the San Bernardino County Museum and Arizona Museum of Natural History cited therein).

3.9.1.1 Affected Environment

Introduction

Fossils are any evidence of ancient life. This includes the remains of the body of an organism such as bones, skin impressions, shell, or leaves, as well as traces of an organism's activity such as footprints or burrows (USDI 2000). In addition to the fossils themselves, geologic context is an important component of paleontological resources. Geological context can include the stratigraphic placement of the fossil, lithology of the rock (to assess paleoecologic setting), depositional environment, and fossilization process.

The Paleontological Resources Preservation Act (PRPA) defines paleontological resources as:

> *…any fossilized remains, traces, or imprints of organisms, preserved in or on the earth's crust, that are of paleontological interest and that provide information about the history of life on earth, except that the term does not include—(A) any materials associated with an archaeological resource (as defined in section 3(1) of the Archaeological Resources Protection Act of 1979 (16 United States Code [USC] 470bb(1)); or (B) any cultural item (as defined in section 2 of the Native American Graves Protection and Repatriation Act (25 USC 3001)). [PRPA; Sec. 6301: Definitions].*

The definition of the term "paleontological resources" in the PRPA limits paleontological resources to fossilized remains that are of paleontological interest and which inform the history of life on earth. Therefore, under the PRPA's definition, not all fossils are considered paleontological resources.

Geologic Setting

As developed in the paleontological resources summary (AZTEC Engineering 2023), the Project lies within the Sonoran Desert section of the Basin and Range physiographic province, a region characterized by fault-block mountain ranges and intervening sediment-filled basins. Specifically, the Project is near the western end of the Harquahala Plain, a basin bounded by the Harquahala, Big Horn, Saddle, Gila Bend, Eagletail, and Little Harquahala Mountains. The basin and range province is characterized by abrupt changes in elevation, alternating between mountain chains and flat, arid valleys. Normal faulting in the Miocene (14 to 15 million years ago) produced a series of roughly north–south trending fault blocks, and the valleys were filled in with debris carried down by wind and water. This debris forms broad alluvial fans that slope down to alluvial plains of relatively recent sediments.

Paleontological Potential

The Project lies on the western margin of the Harquahala Plain, an area characterized by alluvial depositional processes at the base of volcanic and metamorphic mountains. The BLM's (2022) PFYC database, based on geologic mapping by Hirschberg and Pitts (2000) at a scale of 1:500,000, identified the entirety of the Project area (approximately 3,533 acres) as surficial sediments that range in age from the Holocene to the Pleistocene and are assigned unknown (PFYC U) paleontological potential due to being unknown or poorly studied. Neither the San Bernardino County Museum nor the Arizona Museum of Natural History had records of fossil localities in the Project area or within a 10-mile radius (AZTEC Engineering 2023).

The highest resolution geologic mapping available for the Project area is that of Richard et al. (2023) at a scale of 1:100,000. This mapping shows that the Project area is composed primarily of various types of Holocene-aged surficial deposits (that is, young alluvium, mixed eolian and young alluvial deposits, and young channel and low terrace deposits along axial washes) (Richard et al. 2023). Where assessed elsewhere in Arizona, surficial deposits that are restricted to the Holocene in age are assigned low (PFYC 2) paleontological potential due to their young age (BLM 2022).

A small portion of the area is mapped as younger intermediate alluvial fan and terrace deposits that date to the late Pleistocene (Richard et al. 2023). These deposits are also likely present underlying the surficial Holocene-aged deposits described above at an unknown depth throughout the Project area. The BLM's rankings of Pleistocene-aged alluvial and terrace deposits are variable across Arizona, with units assigned either unknown (PFYC U) or moderate (PFYC 3) paleontological potential. As noted in the records search from the San Bernardino County Museum, Pleistocene-aged alluvium commonly preserves fossils throughout southwest North America (AZTEC Engineering 2023). The proportion of each of these geologic units varies between the Action Alternatives.

Trends and Actions

The pace of development of solar projects and associated transmission infrastructure across the American west increase potential for effects to paleontological resources, both direct and indirect, from a particular project as well as cumulatively across the region. This may be in the form of adverse effects, should fossils be damaged or destroyed; or they may be positive effects, should appropriate mitigation activities be followed that result in either the salvage of scientifically significant fossils (that is, paleontological resources per the PRPA) that can be preserved in a Federal repository for future study, outreach, and educational purposes, or improved in-place protection.

3.9.1.2 Impacts

No Action

Under the No Action Alternative, the trends and actions would occur as described under the affected environment. The Project would not be developed; and paleontological resources would only be affected by those trends and actions.

Proposed Action

Geologic mapping by Richard et al. (2023) shows approximately 98.3 percent of the Project area in the Proposed Action (3,473.76 acres) is mapped as various types of Holocene-aged surficial deposits (that is, young alluvium, mixed eolian and young alluvial deposits, and young channel and low terrace deposits along axial washes), with low (PFYC 2) paleontological potential. Approximately 1.7 percent (59.77 acres) of the area is mapped as younger intermediate alluvial fan and terrace deposits that date to the late Pleistocene, with unknown (PFYC U) paleontological potential.

Surficial activities in these areas mapped as sediments with low (PFYC 2) paleontological potential are unlikely to have an effect on paleontological resources. Surficial activities in areas mapped as sediments with unknown (PFYC U) paleontological potential or subsurficial activities that exceed the depth of the low-potential surficial sediments may encounter paleontological resources.

Should paleontological resources be damaged or destroyed by Project activities, it would constitute a direct adverse effect. With the implementation of the SWPPP and restoration plan, combined with the generally flat terrain of the Project area, indirect effects through increased

erosion are unlikely. As most of the Project area is too young to preserve fossils, the increased human presence is unlikely to pose adverse effects to paleontological resources.

Action Alternative: Wash Avoidance

The Wash Avoidance Alternative would share the same overall footprint as the Proposed Action but would avoid construction within the desert wash that crosses the Project generally from west–southwest to east–northeast. Under the Wash Avoidance Alternative, ground disturbance would occur on up to 3,375.94 acres.

Sub-Alternative Options 1 and 2

Impacts from either Option 1 or Option 2 would be of a similar nature to the Proposed Action as the width of the corridor would be consistent, but in Options 1 and 2 the corridor would be longer than the Proposed Action and would impact a larger area.

Cumulative Impacts

Should paleontological resources be damaged or destroyed by Project activities, it would prevent those resources from becoming part of scientific study, thus limiting our broader understanding of the time period from which the fossils originated and the evolutionary history of the types of organisms preserved. Thus, the Project could contribute to cumulative adverse effects to paleontological resources. Alternatively, the successful salvage of paleontological resources encountered during Project activities could enhance scientific study, thus contributing to positive cumulative effects. As more solar projects and associated transmission lines are developed, any inadvertent finds of paleontological resources could contribute to cumulative positive effects.

3.9.1.3 Mitigation

Impacts to paleontological resources will be avoided, minimized, or otherwise addressed by application of the design features identified above in Section 2. In addition, an unanticipated discovery plan would be implemented to minimize adverse effects and maximize positive effects to paleontological resources. It would include the following:

- The proponent will immediately notify the BLM Authorized Officer of any paleontological resources discovered as a result of operations under this authorization.

- The proponent will suspend all activities in the vicinity of such discovery until notified to proceed by the Authorized Officer and will protect the discovery from damage or looting. The proponent may not be required to suspend all operations if activities can be adjusted to avoid further impacts to a discovered locality or be continued elsewhere.

- The Authorized Officer will evaluate, or will have evaluated, such discoveries as soon as possible, but not later than ten working days after being notified. Appropriate measures to mitigate adverse effects to significant paleontological resources will be determined by the Authorized Officer after consulting with the proponent. Within ten days, the proponent will be allowed to continue construction through the site or will be given the choice to either (1) follow the Authorized Officer's instructions for stabilizing the fossil resource in place and avoid further disturbance to the fossil resource, or (2) follow the Authorized

Officer's instructions for mitigating impacts to the fossil resource prior to continuing construction in the discovery area.

- Any paleontological resource (site or object) discovered by the Applicant, or any person working on the Applicant's behalf, will be immediately reported to the Authorized Officer. The Applicant will suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery will be made by the Authorized Officer to determine appropriate actions to prevent the loss of significant cultural or scientific values. The Applicant will be responsible for the cost of evaluation, and any decision as to proper mitigation measures will be made by the Authorized Officer after consulting with the Applicant (Gensler, pers. Comm. 2023).

3.10 Socioeconomics and Environmental Justice

The geographic analysis area for socioeconomics and environmental justice includes La Paz County and the census-designated area of Quartzsite. The scope of the temporal analysis for this resource is the duration of the Project (30 years).

The following resources are analyzed in detail in this section:

- Socioeconomics
- Environmental Justice

3.10.1 SOCIOECONOMICS

Issue:

- How would construction, operation and maintenance, and decommissioning of the Project affect the Project area's socioeconomics?

The following impact indicators were used to analyze this issue:

- Community services
- Employment
- Housing availability
- Local and regional economy
- Residential property values

3.10.1.1 Affected Environment

The Project would be in a sparsely populated portion of La Paz County. The county accounted for 0.2 percent of the average population within Arizona from 2018–2021 (USCB 2023a). Quartzsite is the most populous census-designated area in La Paz County, accounting for approximately 10 percent of the county's population. Population has been slightly increasing in La Paz County.

The socioeconomic impacts of a project extend beyond its construction limits and often reach beyond the city or town where it is located. To understand the potential socioeconomic effects of the Project on population characteristics and the services and economy of the area, the BLM defined the potential area of interest as La Paz County. A 5-mile buffer was used to evaluate impacts to the potentially affected areas in terms of community services, employment, housing availability, local and regional economy, and residential property values and to conservatively review the area surrounding the Project. A 30-mile radius beyond La Paz County was used to assess the traffic coming from Quartzsite to the Project area because the nearest large town is Quartzsite, Arizona. It is possible that the construction workforce would travel from Phoenix; however, it is more likely that most construction equipment and workers would be traveling from or through Quartzsite.

Community Services

In La Paz County, there is one sheriff's office located at 1109 W. Arizona Avenue in Parker, Arizona, approximately 65 miles northwest of the Project. Quartzsite has one police department located at 305 Plymouth Road. In La Paz County, there are 10 fire departments (**Table 3-11**). There is one fire department in Quartzsite (Quartzsite Fire & Rescue) located at 70 Tyson Street. Quartzsite has one elementary school and two high schools (Town of Quartzsite 2023). Further, there are three elementary schools within La Paz County (**Table 3-12**). One hospital, La Paz Regional Hospital, is located at 1200 Mohave Road in Parker.

Table 3-11. Fire Departments in La Paz County, Arizona

Fire Department Name	Address	City
Bouse Fire District	44031 Plomosa Road	Bouse
Buckskin Fire Department Station 11	8500 Riverside Drive	Parker
Buckskin Fire Department Station 211	3350 Parker Dam Road	Parker
Colorado River Indian Tribes Fire Department	23701 Mohave Road	Parker
Colorado River Indian Tribes Fire Department Station 80–Airport Station	28945 Airport Road	Parker
Ehrenberg Fire District	49100 Ehrenberg Poston Highway	Ehrenberg
McMullen Valley Fire District	Santa Fe Avenue	Wenden
McMullen Valley Fire District	66998 Salome Road	Salome
Parker Fire District	1101 West Arizona Avenue	Parker
Quartzsite Fire District	70 Tyson Street	Quartzsite [1]

Source: Fire Departments La Paz County, Arizona (Countyoffice.org 2023).
Note: 1. This is the only fire station that lies within the Census-Designated Place of Quartzsite.

Table 3-12. Schools in La Paz County, Arizona

School Name	Address	City
Quartzsite Elementary	930 Quail Trail Street	Quartzsite
Ehrenberg Elementary	49241 Ehrenberg Parker Highway	Ehrenberg
Salome Elementary School	38128 Saguaro & Main	Salome

School Name	Address	City
Ed Options Charter High School Quartzsite Learning Center	560 E. Coyote	Quartzsite
Wenden Elementary School	67488 E. Salome Road	Salome
Arizona Western College Quartzsite Learning Center	695 Kofa Avenue	Quartzsite

Source: Schools (Town of Quartzsite 2023)

The Project would be located near the Hovatter and AT&T Frontage Roads, which are maintained by La Paz County. Based on a review of ADOT historical traffic data (ADOT 2023) the nearest traffic count station is located on I-10 at Hovatter Road (**Table 3-13**).

Table 3-13. Arizona Department of Transportation Traffic Count Data for the Project Area

Route Description	Location ID			Distance from Project Area (Miles)	Year	Annual Average Daily Traffic [1]
I-10	53 39028 50776 54721 63146 71374	80733 154895 190662 250316 250446 268502	314809 355043 356237 493161 603639 654626	0.6	2022	21,523
Sore Finger Road	681022 630655	46648 160648	347816	1.0	2022	24
AT&T Frontage Road	Not Available			2.3	2022	Not Available
Hovatter Road	630627 680994 314736	347788 630626 680995	630628 680993	3.2	2022	103

Source: Arizona Department of Transportation Traffic Counts: I-10 Hovatter Rd. (ADOT 2023)Notes:
Note: 1. Averages of location IDs were taken to calculate the annual average daily traffic.

Employment

Unemployment rates remained the same in both La Paz County and across Arizona between 2017–2020 and 2018–2021. Unemployment remains high in La Paz County. Approximately 42 percent of the population is in the civilian labor force (ages 16 and older).

Housing Availability

According to the USCB, H1 Housing Vacancy table (USCB 2023b), the housing vacancy rate is approximately 47 percent in Quartzsite and is approximately 45 percent in La Paz County. Based

on a general internet search, there are one hotel and 12 recreational vehicle (RV) parks in Quartzsite for temporary housing, with RV parks averaging 88–100 lots per park.

Local and Regional Economy

The majority of La Paz County's local and regional economy is made up of the following industries: educational services, healthcare and social assistance; arts, entertainment, and recreation; accommodations and food services; and public administration. The majority of Quartzsite's local and regional economy is made up of the following industries: retail trade, transportation warehousing, and utilities; and educational services, healthcare, and social services (USCB 2023c).

Residential Property Values

Approximately 49 percent of the housing values in La Paz County are between $100,000-$299,999, and approximately 20 percent of housing values are less than $50,000. Approximately 60 percent of the housing values in Quartzsite are less than $50,000, and approximately 26 percent are between $100,000-$299,999.

Trends and Actions

The analysis area is Quartzsite and La Paz County, which have small populations, relatively high unemployment, and low-income economic challenges. For instance, La Paz County's median income is $39,732 compared to the state's median income of $69,021. The anticipated incremental addition of future solar projects and transmission line facilities in the analysis area would increase employment and tax receipts for Quartzsite and La Paz County and would provide more income opportunities for the local community over time.

3.10.1.2 Impacts

No Action

Under the No Action Alternative, the Project would not be developed; and socioeconomic resources would only be affected by the trends and actions without any effects from the Project.

Proposed Action

Construction

Community Services

In-migration due to construction is expected to be minimal; however, workers could migrate temporarily into the area from other counties or adjacent states during construction. Laborers and contractors may be drawn throughout the region, including from Phoenix, Yuma, and Southern California. This would create short-term and temporary impacts to community services for La Paz County and Quartzsite by potentially putting more stress on those services, like schools and emergency services. Traffic would approach the site from major roadways designed and capable of handling high volumes, including an interstate. There are no commercial or residential areas near the site, so the increase in traffic would not affect any local populations.

Employment

Construction of the Project is likely to temporarily decrease the level of unemployment in La Paz County. The effects on regional employment as a result of constructing the Project would be minor but beneficial. During construction, an estimated average of 300 workers would be employed, with peak employment of approximately 600 workers. The spring and fall seasons would be busiest, while local weather is favorable, which would not interfere with the winter migrant populations. Following principal construction, the workforce would reduce from the peak of 600 employees to fewer than 20 employees. The Applicant would employ qualified local and non-local contractors and subcontractors according to the equipment and personnel needs of the Project. Workers may be drawn from throughout the region, with local in-demand skills likely having an advantage in bids due to their proximity to the Project. Local hiring would depend on the availability of workers with the appropriate skills.

Housing Availability

No temporary or permanent on-site housing would be provided for construction, operation and maintenance, or decommissioning workers. The workers who migrate from other counties and states would occupy a nominal amount of the available vacant rental housing in La Paz County. No substantial adverse effects on regional housing would occur due to the RV parks averaging about 88-100 lots per park. The RV parks would fully support an increase of potentially 300–600 construction workers. However, there could be slight impacts from additional persons temporarily occupying the RV parks in the winter months due to the additional influx of seasonal migrant populations to the area.

Local and Regional Economy

The construction workers would increase tax receipts for the area by consistently buying supplies, food, and lodging locally, among other expenditures. Construction of the Project will result in increased state and local sales tax revenues associated with the purchase of some construction materials as well as goods and services consumed by the construction workforce. For instance, additional money will be spent locally on the purchase/rental of equipment and purchase of materials such as stone, concrete, fencing material, and bulk fuel. As available, these items and others required for construction will be purchased from local businesses near the Project. In addition, local communities will benefit from ad valorem taxes, paid annually by Jove Solar over the life of the solar facility. Spending on similar solar projects has been estimated to be approximately $20 million. This value takes into consideration the initial spending on the other solar projects plus workers' salary and compensation (Development Research Partners 2021).

Residential Property Values

According to studies conducted by Kirkland Appraisals, LLC (Development Research Partners 2020), construction would have neither a negative nor a positive impact on real estate values for adjoining or abutting properties.

Operation and Maintenance

The effects of the Project's operation and maintenance would be significantly reduced as a small workforce would result in little to no effect on community services, employment, housing availability, local and regional economy, and residential property values. Taxes during operation

will result in increased state and local sales taxes, and local communities will benefit from ad valorem taxes. Further, there will be neither a negative nor positive impact on real estate values for adjoining or abutting properties.

Decommissioning

The effects of Project decommissioning would be similar to the effects of construction in that there would be the temporary introduction of construction equipment and ground disturbance. There would be short-term temporary impacts to traffic; however, there would be an increase in wages and spending and taxes. La Paz County and surrounding communities would be able to sustain an influx of additional construction workers. There would be a short-term temporary impact to traffic in Quartzsite; however, use of the traffic management plan would mitigate the potential issue.

Cumulative Impacts

The cumulative impact analysis area includes 10 miles outside the Project area. As part of the BLM's Western Solar Plan, several energy and transmission line facilities are planned within 10 miles of the Project, including the Atlas North Solar Project, Ten West Link Transmission Line, Cielo Azul Switchyard, Centennial Flats Solar Project, Ranegras Plains Solar and Storage Project, Bouse Solar and Storage Project, and Socorro Solar Project.

The construction schedule of the Project could overlap with the construction schedule of the future actions which could increase the potential for socioeconomic impacts on public services and housing. This effect could be avoided or minimized through coordinated planning, and any impacts would be short term and temporary. An increase in solar projects would also increase the amount of employment and taxes to the area, providing La Paz County and nearby census-designated places positive economic benefits.

The cumulative impacts of proposed projects within the geographic scope of the Project would have minor, short-term, temporary, and beneficial impacts on public services in La Paz County and Quartzsite, and they would contribute positively to the economics of the area. The various projects would bring in tax money for the county and the census-designated places and provide potential jobs for local skilled workers. Therefore, no impacts to public services, traffic, and housing are anticipated.

Action Alternative: Wash Avoidance

Construction

Construction activities associated with the Wash Avoidance Alternative would result in the same impacts on socioeconomic resources as those described in the Proposed Action.

Operation and Maintenance

Operation and maintenance associated with the Wash Avoidance Alternative would result in the same impacts on socioeconomic resources as those described in the Proposed Action.

Decommissioning

The socioeconomic impacts from decommissioning the Wash Avoidance Alternative would be the same as those described for the Proposed Action.

Sub-Alternative Options 1 and 2

Impacts from either Option 1 or Option 2 would be of a similar nature to the Proposed Action as the width of the corridor would be consistent, but in Options 1 and 2 the corridor would be longer than the Proposed Action and would impact a larger area.

Cumulative Impacts

The cumulative impacts on socioeconomics for the Wash Avoidance Alternative would be the same as those described for the Proposed Action.

3.10.1.3 Mitigation

Impacts to socioeconomics will be avoided, minimized, or otherwise addressed by application of the design features identified above in Section 2. The BLM has not identified additional mitigation measures beyond those design features.

3.10.2 ENVIRONMENTAL JUSTICE

Issue:

- How would environmental justice communities be impacted by the construction and operation of the Project?

The following impact indicators were used to analyze this issue:

- Minority population percentage of the community vs. minority population percentage of the reference area for the community
- Low-income population percentage of the community vs. low-income percentage of the reference area for the community
- Tribal presence in the community

3.10.2.1 Affected Environment

Environmental justice includes people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people should bear a disproportionate share of the negative environmental consequences resulting from industrial, governmental, and commercial operations or policies (EPA 2016).

The term “environmental justice community” refers to disadvantaged communities that have been historically marginalized and overburdened by pollution. Environmental justice

communities include minority populations, low-income populations, and Tribal Nations (BLM 2022).

Approximately 32 percent of Arizona's population has been a part of a low-income population (that is, median household income is 200 percent below the poverty line) in the last 12 months. Approximately 44 percent of La Paz County's population is part of a low-income population. Approximately 57 percent of Quartzsite's population is a part of a low-income population. Both La Paz County and Quartzsite have a higher poverty level compared to the state of Arizona. Based on the BLM's Low-Income Threshold Criteria Method, Quartzsite is considered an environmental justice community (USCB 2023d).

Arizona has an approximately 47 percent minority population; La Paz County has an approximately 45 percent minority population; and Quartzsite has an approximately 25 percent minority population. Based on the BLM's Minority Threshold Criteria Method, neither Quartzsite nor the Project area are considered environmental justice communities for minority populations, although it is noted that La Paz County and Quartzsite have sizable minority populations (**Table 3-14**) (USCB 2023e). Minority communities are not associated with any Federal, state, or Tribal Nations lands within the Project area. The closest residents are located over 1.5 miles away off Palomas-Harquahala Road.

Table 3-14. Demographics and Income in the State, County and Locality of the Project Area

Demographics and Income		Arizona	La Paz County	Quartzsite, Arizona
Demographics [1]	White Alone, not Hispanic or Latino	53.4%	56.1%	74.6%
	Black or African American Alone	4.2%	0.4%	0.0%
	American Indian and Alaska Native Alone	3.6%	11.8%	0.0%
	Asian Alone	3.2%	0.9%	4.5%
	Native Hawaiian and Other Pacific Islander Alone	0.2%	0.0%	0.0%
	Some Other Race Alone	0.3%	0.0%	0.0%
	Two or More Races	3.2%	2.5%	0.0%
	Hispanic or Latino (Of Any Race)	31.9%	28.3%	20.9%
Income [2]	Median Household Income in 2021	$69,021	$39,732	Not Available
	Per Capita Income in Past 12 Months	$37,638	$26,165	Not Available
	200 Percent Below Poverty Level	31.7%	44.3%	56.7%

Sources:
[1] United States Census Bureau: Hispanic or Latino Origin by Race. (USCB 2023e)
[2] United States Census Bureau: Quick Facts. (USCB 2023f)

In addition to the census data collected, the area of Quartzsite is known to have a migrant population, sometimes upward to 500,000 people in the winter months (USA Adventure Gear 2023). The migrant population (mostly seasonal residents) typically lives within the RV parks in Quartzsite and surrounding areas in La Paz County.

3.10.2.2 Impacts

No Action

Under the No Action Alternative, the Project would not be developed; and environmental justice communities would only be affected by the trends and actions.

Proposed Action

Construction

The small influx of workers would not displace the minority or low-income populations, as worker influx into Quartzsite is expected to be minor. However, there may be some minor impacts of housing in the RV parks during the winter months when additional migrant populations move into the area. Environmental justice communities would benefit from potential jobs during construction of the Project.

Operation and Maintenance

The effects of operation and maintenance would be little to none on the environmental justice communities due to the small-scale and sporadic work conducted during this period.

Decommissioning

The effects of Project decommissioning would be similar to the effects of construction in that there would be a temporary influx of workers as well as local job opportunities.

Cumulative Impacts

The cumulative impact analysis area includes 10 miles outside the Project. As part of the BLM's Western Solar Plan, several energy and transmission line facilities are planned within 10 miles of the Project, including the Atlas North Solar Project, Ten West Link Transmission Line, Cielo Azul Switchyard, Centennial Flats Solar Project, Ranegras Plains Solar and Storage Project, Bouse Solar and Storage Project, and Socorro Solar Project.

The construction schedule of the Project could overlap with the construction schedule of some future actions and could increase the potential for impacts to the RV parks due to the influx of construction workers. However, environmental justice communities would not be displaced by construction workers. If construction of the solar projects occurs over many years, there would be additional benefit from potential longer-term employment over the construction of many projects.

Operation and maintenance of the Project and future actions would increase the presence of solar and transmission facilities. The effect would be insignificant because the nearest environmental justice community is over 30 miles away.

Process and Compliance

To engage with the environmental justice communities, the BLM would commit to scheduling open houses in Quartzsite and other places that are easily accessible within La Paz County. These open houses would be conducted during non-traditional working hours to allow for everyone to have an opportunity to participate. Documents would also be translated into Spanish for those who do not speak English. The BLM would meet with local community organizers to understand what the community needs and goals are.

Action Alternative: Wash Avoidance

Construction

Construction activities associated with the Wash Avoidance Alternative would result in the same impacts on environmental justice communities as those described in the Proposed Action.

Operation and Maintenance

Operation and maintenance associated with the Wash Avoidance Alternative would result in the same impacts on socioeconomic resources as those described in the Proposed Action.

Decommissioning

The impacts on environmental justice communities from decommissioning associated with the Wash Avoidance Alternative would be the same as those described for the Proposed Action.

Sub-Alternative Options 1 and 2

Impacts from either Option 1 or Option 2 would be of a similar nature to the Proposed Action as the width of the corridor would be consistent, but in Options 1 and 2 the corridor would be longer than the Proposed Action and would impact a larger area.

Cumulative Impacts

The cumulative impacts on socioeconomics for the Wash Avoidance Alternative would be the same as those described for the Proposed Action.

3.10.2.3 Mitigation

Impacts to environmental justice will be avoided, minimized, or otherwise addressed by application of the design features identified above in Section 2. The BLM has not identified additional mitigation measures beyond those design features.

3.11 Travel and Transportation Management

The geographic analysis area for travel and transportation resources is within 8 miles of the Project and for the duration of construction for certain impacts, and within 50 miles of the

Project and for the duration of the Project for certain impacts. The scope of the temporal analysis for this resource is the duration of construction, and the duration of decommissioning.

The following resources are analyzed in detail in this section:

- Travel and transportation management

3.11.1 TRAVEL AND TRANSPORTATION MANAGEMENT

Issues:

- How would Project construction traffic affect the surrounding traffic volumes and conditions?
- How would traffic from operation and maintenance affect the surrounding traffic volumes and conditions?
- How would the Project affect existing access to the Eagletail Mountains Wilderness area?

The following impact indicators were used to analyze these issues:

- Number of Project trips generated (by equipment and employees) during construction and during operation and maintenance
- Changes to level of service (LOS) and increase in delay on major roadways/intersections used by the Project during construction and operation and maintenance

Data sources evaluated in this analysis include the following:

- Jove Solar Project Traffic Impact Analysis Report (AZTEC Engineering 2022)

3.11.1.1 Affected Environment

Roadways

Roadways that would be used to access the Project include the I-10 Eastbound and Westbound Ramps, Hovatter Road, the AT&T Frontage Road, and unpaved/graded site entrances that would connect to the AT&T Frontage Road (that is, one access located on each side of the AT&T Frontage Road).

Intersections

The following two stop-controlled intersections are analyzed during construction and operation and maintenance:

- I-10 Eastbound Ramps/Hovatter Road
- I-10 Westbound Ramps/Hovatter Road

Traffic Volumes and LOS

Daily volume on Hovatter Road is approximately 85 Average Daily Trips (ADT), and peak hour volumes range from approximately 16–23 vehicles per hour (AZTEC Engineering 2022). Traffic impact analysis procedures provided in the La Paz County Public Works Design and Construction Manual for LOS were used to analyze and evaluate the Project's potential traffic impacts (AZTEC Engineering 2022). LOS is a qualitative index, a measure of traffic operating conditions that is designated A through F, with LOS A representing free-flow conditions and LOS F representing severe traffic congestion.

Eagletail Mountains Wilderness is located about 75 miles west of Phoenix, just south of I-10. It is located 13 miles southeast of the Project. Traffic going to the Eagletail Mountains Wilderness area traveling on I-10 east would use the same route as Project traffic after exiting I-10 at Hovatter Road and would pass through the Project area.

Trends and Actions

Existing LOS was calculated at the two study intersections, which shows that the two intersections currently operate at a desirable LOS during the morning and afternoon peak hours.

3.11.1.2 Impacts

No Action

Under the No Action Alternative, there would no direct or indirect effects on the traffic and transportation from the Project.

Proposed Action

Construction

Construction would take approximately 18 months, and activity is expected to peak in 2024. During construction, a maximum of 600 employees per day would commute from the nearest cities (for example, Blythe, California and Phoenix, Arizona). Assuming half of the employees would carpool, the number of trips generated by the employees would be 600 trips per day (that is, 300 inbound during the morning peak hour and 300 outbound during the afternoon peak hour). There would be an additional 50 peak hour trips (25 trips in and 25 trips out) during the morning peak hour and also during the afternoon peak hour for construction-related deliveries. There will be additional 390 construction related deliveries and heavy vehicles throughout the day for a total of 490 ADT. Therefore, the Project would generate 350 trips during the morning peak hour (25 construction deliveries in and 25 out, plus 300 employee trips) and, 350 trips during the afternoon peak hour, and a total of 1,090 ADT during construction.

Project operation and maintenance is expected to begin in 2026. The Project would require eight full-time employees for daily operations. The number of trips generated by the employees during operation and maintenance would be approximately 16 trips per day—eight trips inbound during the morning peak hour and eight trips outbound during the afternoon peak hour.

To assess the effects of the Project on future traffic operations, LOS was calculated at the two study intersections with and without the Project for the years 2024, 2026, and 2046, which correspond with the peak construction year, full buildout of the Project, and 20 years of operation and maintenance, respectively. With the addition of the Project, the two intersections would operate at a desirable LOS C or better during the year 2024 peak construction conditions, and a desirable LOS A under the 2026 and 2046 operation and maintenance conditions.

To accommodate the potential use of the most common largest semi-trailer (WB-67), also called the interstate design vehicle, on-site and off-site access improvements are recommended in the Project's traffic study. Off-site unpaved access roads are recommended to be designed based on the La Paz County Public Works Design and Construction Manual. Also, a new stop sign is recommended for any permanent access driveways onto the AT&T Frontage Road.

Direct effects common to both Action Alternatives during the construction phase would consist of construction-related traffic that includes large trucks and potentially oversized loads. Increased traffic would occur on all types of roadways in the area, but would be phased, occurring at different locations at different times. An estimated 350 trips would be added to the roadway network during the morning and afternoon peak hours. The intensity of traffic impact from construction would be temporary and short-term, with low effect.

The Project does not anticipate closing the route access to the Eagletail Mountains Wilderness area during construction or operation and maintenance. Therefore, the Project would have no impact on access to the Eagletail Mountains Wilderness area.

Operation and Maintenance

After construction, traffic generated by operation and maintenance activities would be intermittent and require a small number of vehicles, and deliveries would not regularly occur. Operation and maintenance traffic would add negligible traffic on primary roadways and, subsequently, would not decrease the LOS for any primary roads.

Decommissioning

Decommissioning activities would have generally the same impacts to traffic and transportation resources as described for construction.

Action Alternative: Wash Avoidance

Construction

Under the Wash Avoidance Alternative, Project components such as solar arrays, stormwater features, buildings, etc. would not be constructed within 500 feet of either side of the centerline of the desert wash that crosses the northern portion of the Project area. While the Wash Avoidance Alternative would limit Project components within a portion of the Project area, there would be no significant traffic impacts as the solar arrays would be contained within the same footprint as the Proposed Action. As such, the Wash Avoidance Alternative would result in the same temporary and short-term traffic impacts with low effect as the Proposed Action.

Operation and Maintenance

After construction, traffic generated by operation and maintenance activities would be intermittent and require a small number of vehicles only, and deliveries would not regularly occur. Operation and maintenance traffic would add negligible traffic on primary roads and, subsequently, would not decrease the LOS for any primary roads.

Decommissioning

Decommissioning activities would have generally the same impacts to traffic and transportation resources as described for construction.

Sub-Alternative Options 1 and 2

Impacts from either Option 1 or Option 2 would be of a similar nature to the Proposed Action as the width of the corridor would be consistent, but in Options 1 and 2 the corridor would be longer than the Proposed Action and would impact a larger area.

Cumulative Impacts

The cumulative assessment of transportation impacts includes existing traffic volumes, Project-generated traffic, and traffic from future projects on roads and highways in the Project vicinity. These include potential cumulative traffic impacts during construction and operations.

Construction of other developments in the vicinity concurrent with the Project could have a short-term and temporary negative cumulative impact on traffic conditions. The traffic from cumulative projects would have a nominal effect only on traffic volumes on the surrounding roadway network due to the remote location of the project sites and because the need for construction trips would be short term and temporary.

3.11.1.3 Mitigation

Impacts to travel and transportation will be avoided, minimized, or otherwise addressed by application of the design features identified above in Section 2. In addition, required plans and agreements will be developed as follows.

Construction and Decommissioning Traffic Control and Management Plan

Prior to issuance of construction permits, building permits, or encroachment permits, the Applicant or its construction contractors would prepare and submit a traffic control and management plan to the BLM and ADOT for approval. The traffic control and management plan would be prepared in accordance with both the *Manual on Uniform Traffic Control Divisions* and *Work Area Traffic Control Handbook,* and must include but not be limited to the following items:

- Specify timing of deliveries of heavy equipment and building materials.
- Direct construction traffic with a flagger.

- Place temporary signage, lighting, and traffic control devices, if required, including but not limited to appropriate signage along access routes to indicate the presence of heavy vehicles and construction traffic.

- Provide access for emergency vehicles to the Project site.

- Maintain access to adjacent property.

- Specify both construction-related vehicle travel and oversized load haul routes, minimize construction traffic during the morning and afternoon peak hours, and avoid residential neighborhoods to the maximum extent feasible.

- Obtain all necessary permits from the appropriate agencies for work within the road ROW for use of oversized/overweight vehicles which may require ADOT Highway Patrol or a pilot car escort.

- Submit plans for any work on the proposed intersection improvements at the site access driveways to the BLM and ADOT for review and approval prior to the issuance of any encroachment or road improvement permit for the work.

- Clean or remove any material that is deposited onto the roadways as soon as possible and at least prior to the end of each working day.

- Obtain any access easements from private property owners necessary to perform required repair work.

Preconstruction and Pre-Decommissioning Road Survey Report

A preconstruction report and a pre-decommissioning report would be prepared by a qualified registered engineer to include a detailed analysis of road suitability to accommodate haul trucks during Project construction. The report would be submitted to the BLM and ADOT Planning. Prior to initiating the preconstruction or decommissioning report, the proposed methodology would be presented to the BLM and ADOT Planning for review and approval. Improvements to existing roads may be necessary based on the findings of the report.

Road Repair Agreement

Prior to construction, the Applicant should enter into a secured agreement with the BLM to help ensure that the Applicant contributes its fair-share portion toward repairs of any BLM roads that are impacted by this Project. The scope of impacts would be determined in consultation with the BLM and ADOT.

3.12 Visual Resources

The geographic analysis area for visual resources is within 15-miles of the Project. The scope of the temporal analysis for this resource is the duration of the Project (30 years).

Visual, or aesthetic, resources are the natural and cultural features of the landscape that can be seen and that contribute to the public's appreciative enjoyment of the environment. Visual resource impacts are generally defined in terms of a project's physical characteristics and the potential visibility and extent to which the project's presence would change the perceived visual character and quality of the environment in which it would be located.

The following assessment of visual resources uses the BLM's VRM system to assess the existing landscape setting for the Jove Solar Project, identify potential sensitive views, assess the levels of visual contrast that would be introduced through the construction and operation of the Project, and evaluate potential light and glare impacts from operation of the Project.

Data sources evaluated in this analysis include the following:

- Jove Solar Project Visual Resources Technical Report (AZTEC Engineering 2023a)
- Jove Solar Project Reflectivity Analysis Technical Report (AZTEC Engineering 2023b)
- Jove Solar Plan of Development (Jove Solar, LLC 2023)
- Yuma Field Office Resource Management Plan (BLM 2010)

The following resources are analyzed in detail in this section:

- Scenic Quality
- Light and Glare

3.12.1 SCENIC QUALITY

The analysis area for visual resources includes the viewshed within 15 miles of the Project (**Figure 3-2**). The analysis area is where potential visual effects from the Project may be discerned by the casual observer and represents where within the surrounding landscape the Project would theoretically be visible.

Source: AZTEC Engineering 2023

- Key Observation Point (KOP) Including Direction of View
- Overhead Gen-Tie
- Solar Facility
- AT&T Frontage Rd
- Utility Easement
- Previously Approved Cielo Azul Substation and Switchyard
- 9-Mile Radius Buffer of Project Area

Miles
0 1.5 3

N

Figure 3-2
Project Location and Key Observation Points

Issue:

- How would construction, operation, and decommissioning of the Project contrast with the area's scenic quality?

The following impact indicators were used to analyze this issue:

- The area in which the Project would be visible within a 15-mile radius
- Contrast perceived by viewers when the Project is viewed from a representative set of viewpoint locations, referred to here as KOPs
- Conformance with BLM's VRM Class III objectives

BLM's VRM system provides a framework for managing visual resources on BLM-administered lands. The VRM system involves inventorying scenic values through the Visual Resource Inventory (VRI) process, establishing management objectives for those values through the resource management planning process, and evaluating proposed activities to determine whether they conform to the management objectives established in the RMP for the area (BLM 1986a).

The assessment of the Project's potential impacts to visual resources included: preparation of a viewshed analysis that shows the areas of potential Project visibility within a 15-mile radius based on topography and the height of Project elements (14 feet); site reconnaissance and photography; production of visual simulations; and the application of the BLM's Visual Contrast Rating process through the following steps:

1. Establish the visual environment for the area within which the Project would be located and determine the VRM classifications within the Project area.
2. Assess the existing visual resources present within the Project area to identify potential impacts to visual values resulting from the Project.
3. Review the viewshed analysis in coordination with BLM to identify critical viewpoints or KOPs from where the Project may be viewed.
4. Complete contrast rating worksheets for each KOP based on field observations and supporting visual simulations to assess conformance with VRM objectives and determine potential visual impacts.

The methods used for the viewshed analysis, field investigations, KOP selection, scenic quality rating, and viewer sensitivity rating followed BLM Manual 8431 (BLM 1986b).

Data sources evaluated in this analysis include the following:

- Jove Solar Project Visual Resources Technical Report (AZTEC Engineering 2023a).

3.12.1.1 Affected Environment

Visual Analysis Area Overview

The Project is in the Lower Colorado River Valley subdivision of the Sonoran Desert within an area designated by BLM as VRM Class III (BLM 2010, BLM 2022). The objective of VRM Class III is to partially retain the existing character of the landscape. The level of change to the characteristic landscape would be moderate. Management activities may attract attention but would not dominate the view of the casual observer.

The Project area—the land on which solar arrays, access, and overhead electrical connection are proposed—is within the Harquahala Plain, a broad, flat valley bounded by the Eagletail Mountains Wilderness to the southeast, the Little Harquahala Mountains to the north, and the New Water Mountains within the Kofa National Wildlife Refuge to the southwest. This portion of the plain is primarily characterized by widespread grazing lands dominated by creosote bush and annual grassland vegetation. The topography of the Project area is relatively flat with some moderate variation as ephemeral washes traverse the area. The topographic characteristics of the Project area, along with the low-lying vegetation, allow for open, expansive views of the surrounding mountain ranges.

Development within the Project area is sparse. There are a few structures associated with the El Paso Natural Gas plant about 5 miles east of the Project area on the El Paso Natural Gas Company access road. Other land uses within the analysis area include the Salome Emergency Airfield, a dirt landing strip about 2 miles to the north, agriculture activities about 14 miles to the northwest, and mining activities about 6 miles to the north within the Little Harquahala Mountains.

I-10, a paved four lane highway that extends west to east, is the dominant linear feature in the analysis area. Other linear features within the analysis area include the CAP canal (about 1 mile to the north) and overhead utility infrastructure, including the Devers-Palo Verde 500 kV transmission line about 0.3 mile to the south. There are also several unpaved roads within the Project area, including Palomas-Harquahala Road, 51st Street, and AT&T Frontage Road. Greens, reddish browns, yellows, grays, and tans associated with the shrublands, and their underlying desert soils are the prominent colors in views of the Project area. I-10 appears gray and evidence of land alterations from access roads appear tan, reflecting soils in the area. Non-vegetated areas result in some gradation of texture; however, shrublands and limited development result in a generally medium-grained, mostly consistent texture throughout the landscape.

Visual Resources Inventory

The inventory stage of the BLM's VRM system assesses scenic quality, viewer sensitivity, and distance zones to determine VRI classes. These classes represent the relative value of the existing visual landscape against which the BLM can measure and evaluate the impacts a project may have on these values. The existing conditions within the analysis area for each category are described below.

Scenic Quality

Scenic or visual quality is the visual appeal of a landscape. Scenic quality ratings are based on evaluation of landform, vegetation, water, color, adjacent scenery, scarcity, and cultural (human-made) modifications. An "A" is the highest rating (for the highest quality), "B" is a moderate rating, and "C" is the lowest rating. The Project area is located within the Harquahala Plain Scenic Quality Rating Unit (SQRU) that was inventoried in 2016 (BLM 2016). The Harquahala Plain SQRU is rated as Scenic Quality Class C as it consists of flat rolling plains evenly covered with low sparse desert vegetation and includes irrigation canals and sparse clusters of cultural modifications (BLM 2016).

Viewer Sensitivity

Visual sensitivity is based on the number and type of viewers and the frequency and duration of views. Typically, visual sensitivity increases with an increase in the total number of viewers, the frequency of viewing (for example, daily vs. seasonally), and the duration of views (that is, how long a scene is viewed). The Sensitivity Level Rating Unit for the Project area is classified as moderate due to the presence of I-10 and the moderate degree of interest from those traveling along the highway (BLM 2017).

Distance Zones

Landscapes are subdivided into three distance zones based on relative visibility from travel routes or observation points: foreground-middleground, background, and seldom seen, as described below:

- **Foreground-middleground zone:** includes areas seen from highways, rivers, or other viewing locations which are less than 3 to 5 miles away
- **Background zone:** includes seen areas beyond the foreground-middleground zone but usually less than 15 miles away
- **Seldom seen zone:** includes areas not seen as foreground-middleground or background (that is, hidden from view) (BLM 1986a)

For this analysis, the following distance zones were applied: foreground-middleground, 0.5–3 miles; and background, 3–15 miles (AZTEC Engineering 2023a).

Key Observation Points

KOPs are locations where the public could see the Project both from a stationary (for example, residential area) or a linear (for example, major roadway) location. KOPs for this analysis were identified based on a review of aerial photography and topographic maps, coordination with the BLM YFO staff, the viewshed analysis, and field investigations (AZTEC Engineering 2023a). The following sensitive viewer groups were identified for the Project:

- **Travelers:** travelers that use roadways from which the landscape is viewed.

- **Recreational users:** local and seasonal residents engaged in recreational activities and tourists and recreational users visiting from outside of the local area.

- **Residents:** people who live and work in the analysis area, including mining operators and range managers, and people who view the landscape from their properties, homes, and places of employment while engaged in daily activities.

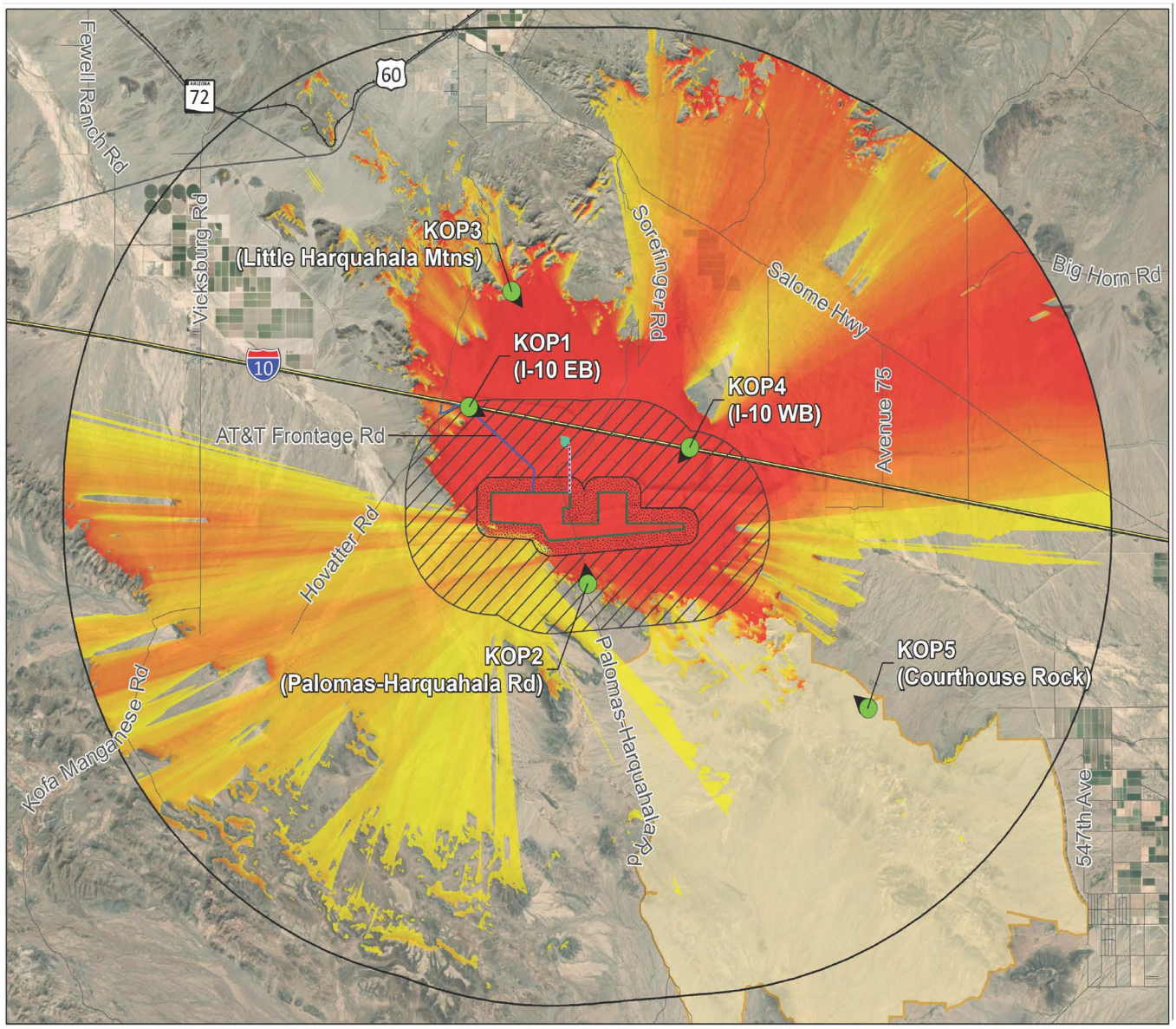
The viewshed analysis shown in **Figure 3-3** indicates the Project would primarily be visible within the foreground and middleground (0.5–3 miles), and views of the Project would generally decrease in the background (3–15 miles) due to intervening topography. Based on review of the viewshed map, five KOPs were selected in coordination with the BLM to represent the views of the Project (**Figure 3-2**). AZTEC Engineering conducted site visits on January 27, 2022, and April 5, 2022, to photograph existing visual conditions and views toward the Project area from KOP 1 through KOP 4. KOP 5 (Courthouse Rock) is included in this analysis as it is a known recreational destination in the Eagletail Mountains Wilderness area. However, no photographs were taken from KOP 5 because access to the saddle or summit is difficult and limited to recreationists with advanced technical climbing skills. Therefore, visual simulations were generated for KOP 1 through KOP 4, and a generalized representation of the view with the Project was prepared for KOP 5.

Visual contrast rating worksheets were completed for all five KOPs which provide detailed analysis of visual impacts (**Table 3-15**). More detailed descriptions of each KOP and the rationale for selection are provided in the *Jove Solar Visual Resources Technical Report* (AZTEC Engineering 2023a). The visual simulations are provided in **Figure 3-4** through **Figure 3-8**.

Table 3-15. Key Observation Points

KOP Number	KOP Name	Sensitive Viewer Group	Approximate Distance to Project
1	I-10 Eastbound	Travelers	4.0 miles
2	Palomas-Harquahala Road	Travelers and Residents	1.5 miles
3	Little Harquahala Mountains	Recreational Users and Residents	6.5 miles
4	I-10 Westbound	Travelers	3.0 miles
5	Courthouse Rock	Recreational Users	8.5 miles

Key: **KOP** = key observation point



Source: AZTEC Engineering 2023

- Key Observation Point (KOP) Including Direction of View
- Overhead Gen-Tie
- Solar Facility
- AT&T Frontage Rd
- Utility Easement
- Previously Approved Cielo Azul Substation and Switchyard
- 0.5-Mile Radius Buffer of Project Area
- 3-Mile Radius Buffer of Project Area
- 15-Mile Radius Buffer of Project Area
- Eagletail Mountains Wilderness

Visibility

More Visible from this Location

Less Visible from this Location

Miles

0 2.5 5

N

Figure 3-3
Viewshed Map

KOP 1A – Existing view located along the shoulder of Interstate 10 (I-10) eastbound lanes looking southeasterly towards the project area. Photo taken April 5th, 2022, at 12:39pm.

KOP 1B – Simulated view of Photo KOP 1A including project in background – The photovoltaic module arrays would be slightly visible in the background.

Source: AZTEC Engineering 2023

Figure 3-4
Key Observation Point 1
Interstate 10 (Eastbound)

KOP 2A – Existing elevated view located south of the project area along Palomas-Harquahala Road looking in a northerly direction. Photo taken January 27th, 2022, at 12:08pm.

KOP 2B – Simulated view of Photo KOP 2A including project in middleground – The photovoltaic module arrays would be seen but do not dominate the view.

Source: AZTEC Engineering 2023

Figure 3-5
Key Observation Point 2
Palomas-Harquahala Road

KOP 3A – Existing view located 6.5 miles north of the project near the Little Harquahala Mountains looking in a southerly direction. Photo taken January 27th, 2022, at 9:53am.

KOP 3B – Simulated view of Photo KOP 3A including project in background – The photovoltaic module arrays would be slightly visible in the background at the base of the mountains.

Source: AZTEC Engineering 2023

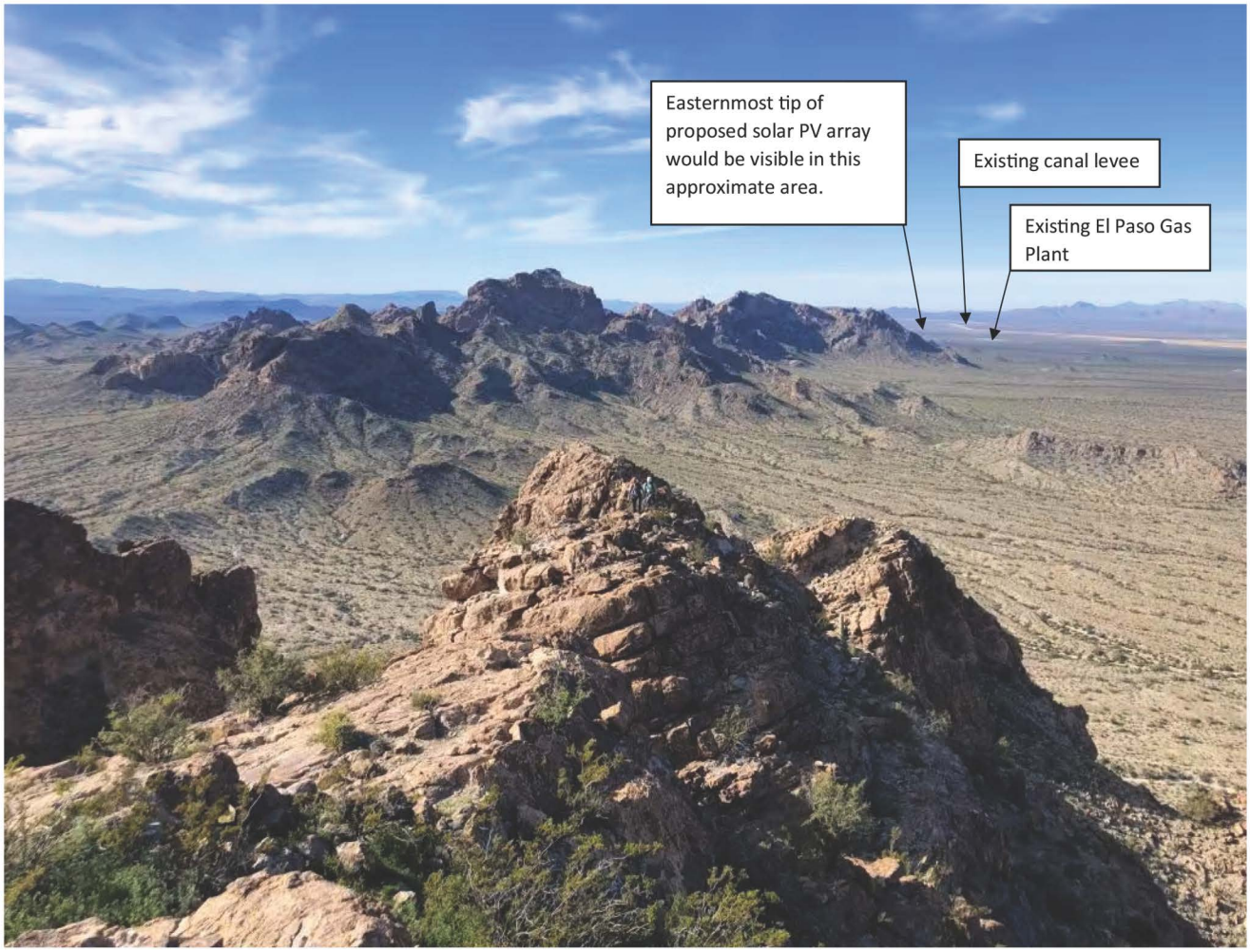
Figure 3-6
Key Observation Point 3
Little Harquahala Mountains

KOP 4A – Existing view located along the shoulder of Interstate 10 (I-10) westbound lanes looking southwesterly towards the project area. Photo taken April 5th, 2022, at 12:09pm.

KOP 4B – Simulated view of photo KOP 4A including project – The photovoltaic module arrays would be slightly visible in the background at the base of the mountains.

Source: AZTEC Engineering 2023

Figure 3-7
Key Observation Point 4
Interstate 10 (Westbound)



KOP 5A – View North from the summit of Courthouse Rock (Summitpost.org 2023). Photo location is unknown, and photo is being shown for informational purposes only because of its similarity to the view in the Google Earth screen capture above.

Source: AZTEC Engineering 2023

Figure 3-8
Key Observation Point 5
Courthouse Rock

Visual Contrast Rating

The BLM uses a visual contrast rating system to analyze the potential visual impact of proposed projects and activities. Visual contrast reflects the degree to which a proposed project's components differ from the existing landscape character and visual quality. Contrast is measured by separating the landscape into major features (for example, land, water, vegetation, structures) then assessing the contrast introduced by the project in terms of the basic design elements of form, line, color, and texture. The degree of contrast introduced by a proposed project to landscape elements is then rated as follows (BLM 1986b):

- **None:** The element contrast is not visible or perceived.
- **Weak:** The element contrast can be seen but does not attract attention.
- **Moderate:** The element contrast begins to attract attention and begins to dominate the characteristic landscape.
- **Strong:** The element contrast demands attention, will not be overlooked, and is dominant in the landscape.

This method reveals a project's elements and features that could cause the greatest degree of visual change, and guides efforts to reduce the visual impact of a proposed activity.

Trends and Actions

Trends and actions related to changes in the scenic quality have and will continue to support the current character of the landscape. The analysis area is characterized by flat rolling plains within the Lower Colorado River Valley subdivision of the Sonoran Desert which are evenly covered with low desert vegetation and have been modified by the development of roadways, utility infrastructure, gas facilities, and mining activities. The anticipated incremental addition of future solar projects and transmission line facilities in the analysis area would continue to contribute to the overall modification of the landscape character and change the associated scenic quality of the analysis area. In locations where future solar and transmission line facilities are anticipated, viewers from KOPs in the analysis area may have visibility of more than one project in multiple directions, which would impact the viewers' experience. As such, the introduction of additional solar and transmission line facilities has affected or could affect the landscape character of the analysis area.

3.12.1.2 Impacts

No Action

Under the No Action Alternative, the trends and actions would occur as described under the affected environment. The Project would not be developed; and scenic quality would only be affected by those trends and actions.

Proposed Action

Construction

The Proposed Action would include construction of the solar facility and ancillary systems, such as the solar PV modules, inverters, collector system, BESS, substation, access roads, aboveground electrical connection line, and operation and maintenance building. Project construction activities would result in temporary visual impacts due to site preparation, grading, the generation of fugitive dust, and the presence of construction equipment, materials, debris, and staging areas. Site preparation would involve cutting shrubs near their base while leaving the root structure intact to minimize soil disturbance. Grading would generally maintain existing contours and would balance the high and low spots.

Construction activities would introduce forms, lines, colors, and textures that would create weak to moderate degrees of visual change to the landscape. The construction-related changes would primarily be visible in the foreground-middleground (0.5–3 miles). Intermittent airborne dust could become visible above construction activities in background views (3–15 miles) and potentially diminish visibility in views to the north and south. Moderate contrast during construction would be compatible with VRM Class III management objectives. The Project would spray water to control dust in the Project area in accordance with the Dust Abatement Plan (Jove Solar, LLC 2023). Upon completion of construction, equipment, materials, debris, and staging areas would be removed from the Project area. Therefore, temporary construction activities would not result in long term adverse effects to scenic quality.

Operation and Maintenance

The Proposed Action would construct a solar facility, overhead electrical connection line, and ancillary systems within a landscape of moderate scenic quality, assessed as such based on the predominance of low, sparse, desert vegetation and modification by roadways, utility infrastructure, and gas facilities. The visual contrast rating analyses completed for the five KOPs determined that, while the Project would be visible in views from I-10 (KOP 1 and KOP 4), the south (KOP 2), the north (KOP 3), and to the southwest near Courthouse Rock (KOP 5), contrast with the existing conditions would range from weak to moderate.

In closer-in views, particularly from the adjacent roadways such as I-10 (KOP 1) and Palomas-Harquahala Road (KOP 2), the solar PV arrays would be prominent features within the foreground-middleground. The dark color and form of the Project would appear in place of the desert shrubland and grassland vegetation and would moderately contrast with the form, line, and color of the landscape. However, due to distance from the KOPs (about 1.5–4 miles) and the Project's relatively low profile, the solar PV arrays would not dominate views of the broader landscape. Motorists traveling along the nearby roadways, including I-10 and Palomas-Harquahala Road, are expected to have moderate sensitivity to changes within the landscape. The view duration and exposure to the Proposed Action from the nearby roadways would be relatively short as motorists would be traveling through the Project area at a high speed (that is, 40–65 miles per hour).

The overhead electrical connection line, substation, operation and maintenance building, and BESS would be noticeable within the foreground-middleground (KOP 1 and KOP 2). The overhead electrical connection structures would be relatively small features, visible at a distance

from the nearby roadways (0.5–3 miles). While the structures would be new vertical features in the landscape, they would not be dominant elements and would be similar in scale to other vertical structures associated with the highway and the Devers-Palo Verde 500 kV transmission line. As such, they would not constitute a strong contrast with the existing scenic quality of the view.

In more distant, expansive views, the Proposed Action would result in weak contrast (KOPs 3, 4, and 5) as it would be contained within the background zone (3–8.5 miles away). The solar PV arrays would appear as relatively dark, narrow geometric forms along the base of the mountains. The vertical form of the overhead electrical connection line would appear at the horizon but would be mostly absorbed into the existing landscape and would not alter the existing visual character of the broader landscape. The surrounding vegetation, topography, and atmospheric conditions would further limit distant views of the Proposed Action as seen in the views from the Little Harquahala Mountains (KOP 3) and Courthouse Rock (KOP 5).

Overall, operation of the Proposed Action would result in weak to moderate contrast with the existing conditions, which would meet VRM Class III objectives for the Project area. The existing landscape character would be retained, and development would not dominate the view of the casual observer.

Decommissioning

When the Project ceases operation, the facilities would be decommissioned and include removal of the solar PV arrays, electrical connection line, substation, and other ancillary facilities. Following the removal of the Project's facilities, the site would undergo final cleanup and reclamation as outlined in the decommissioning and site reclamation plan. Areas disturbed during removal of the Project's components would be backfilled, recontoured, restored, and rehabilitated as near as possible to their preconstruction condition through implementation of a habitat restoration and integrated weed management plan (Jove Solar, LLC 2023).

The effects of Project decommissioning would be similar to the effects of construction, in that there would be the temporary introduction of construction equipment and ground disturbance. However, compared to the construction phase, the decommissioning phase would reduce visual contrast as the solar PV arrays and ancillary structures would be removed from the Project area. Removal of the solar PV arrays and ancillary structures would result in bare soils, which could increase contrast with the surrounding lands dominated by shrublands. This contrast would be moderate within the foreground-middleground (0.5–3 miles); however, discernible contrast would decrease with distance (3–15 miles) and would appear increasingly absorbed into the desert landscape. Over time, visual impacts within the foreground-middleground would be reduced as the affected landscape is returned to preconstruction conditions through revegetation. As part of the habitat restoration and integrated weed management plan (Jove Solar, LLC 2023), native vegetation would be used for revegetating, where feasible, to establish a composition consistent with the form, line, color, and texture of the surrounding landscape. Edges of revegetated areas would be feathered to reduce form and line contrasts with the existing landscape. Therefore, decommissioning activities would not result in adverse effects to scenic quality.

Action Alternative: Wash Avoidance

Construction

Construction activities associated with the Wash Avoidance Alternative would result in the same visual contrast and impact on scenic quality as those described for the Proposed Action.

Operation and Maintenance

Under the Wash Avoidance Alternative, Project components, such as solar arrays, stormwater features, buildings, etc. would not be constructed within 500 feet of either side of the centerline of the desert wash that crosses the northern portion of the Project area. While the Wash Avoidance Alternative would limit Project components within a portion of the Project area, there would be no discernible difference in views of the Project as the solar arrays would be contained within the same footprint as the Proposed Action. As such, the Wash Avoidance Alternative would result in the same visual contrast and impact on scenic quality as the Proposed Action.

Decommissioning

The visual impacts from decommissioning the Wash Avoidance Alternative would be the same as those described for the Proposed Action. The site would undergo final cleanup and reclamation as outlined in the decommissioning and site reclamation plan. Areas disturbed during removal of Project components would be backfilled, recontoured, restored, and rehabilitated as near as possible to their preconstruction condition through implementation of the habitat restoration and integrated weed management plan (Jove Solar, LLC 2023).

Sub-Alternative Options 1 and 2

Impacts from either Option 1 or Option 2 would be of a similar nature to the Proposed Action as the width of the corridor would be consistent, but in Options 1 and 2 the corridor would be longer than the Proposed Action and would impact a larger area.

Cumulative Impacts

The cumulative analysis area includes the viewshed within approximately 15 miles of the Project where the Project could be visible to viewers in the foreground, middleground, or background. Cumulative impacts could occur where the Project is viewed in combination with other past, present, and future actions in the same viewshed. As part of BLM's Western Solar Plan, several energy and transmission line facilities are planned within 15 miles of the Project, including the Atlas North Solar Project, Ten West Link Transmission Line, Cielo Azul Switchyard, Centennial Flats Solar Project, Ranegras Plains Solar and Storage Project, Bouse Solar and Storage Project, and Socorro Solar Project.

The Atlas North Solar Project, Ten West Link Transmission Line, Cielo Azul Switchyard, and Centennial Flats Solar Project would be located within 2 miles of the Project and would appear in foreground-middleground views. The Ranegras Plains Solar and Storage Project, Bouse Solar and Storage Project, and Socorro Solar Project would be located over 5 miles west of the Project and would appear in background views.

The construction schedule of the Project could overlap with the construction schedule of the future actions and would increase the potential for cumulative visual impacts. Some viewers may find views of construction and decommissioning equipment, vehicles, materials, staging areas, and personnel to be obstructive of foreground-middleground views. However, visual impacts during construction and decommissioning would be temporary, and the equipment and materials would be removed from the area once activities are complete.

The operation of the Project and future actions would increase the presence of solar and transmission facilities within foreground-middleground and background views. The Project and future actions within the foreground-middleground would expand the area of visual contrast with the landscape. However, visibility of the Project and future actions would decrease in background views due to distance from viewing sites, intervening vegetation, topography, and atmospheric conditions. Modifications to this portion of the Harquahala Plain is common as evidenced by the existing roadways, utility facilities, and gas development in the area. The Project and future actions would be located on lands designated by BLM as VRM Class III or Class IV. The level of change to the characteristic landscape for these classes ranges from moderate to high. Therefore, while the Project and future actions would increase the presence of solar and transmission line facilities, these modifications would be consistent with the objectives of VRM Class III or Class IV.

3.12.1.3 Mitigation

Impacts to scenic quality will be avoided, minimized, or otherwise addressed by application of the design features identified above in Section 2. The BLM has not identified additional mitigation measures beyond those design features.

3.12.2 LIGHT AND GLARE

Issues:

- How would lighting from construction and operation of the Project impact dark skies and star gazing?
- How would glare from operation of the Project impact views from KOPs?

The following impact indicators were used to analyze this issue:

- The Project creates a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

A glare analysis was completed for the Project using the ForgeSolar Solar Glare Hazard Analysis Tool (SGHAT). The SGHAT meets FAA glare analysis requirements (49 USC 471) and was developed in cooperation with the U.S. Department of Energy. The SGHAT is designed to determine whether a proposed solar energy project would result in the potential for ocular impact (for example, retinal damage or burn), and whether a project demonstrates compliance with the standards for federally obligated airports.

Glare is defined as a semi-continuous and sustained presence of light that may appear to sparkle from viewing locations. The effects of glare can vary from insignificant momentary blinding to temporarily seeing spots or after-images. If the glare is intense enough or of a long duration, it

can cause permanent vision damage. The analysis tool does not consider existing vegetation or structures when calculating results. The potential glare of this Project was analyzed from the selected KOP locations by specifying them in the SGHAT as "discrete observation receptors, user-prescribed observation points."

3.12.2.1 Affected Environment

The area potentially affected by Project-related light and glare is the same viewshed within 15 miles of the Project that is described in **Section 3.12.1.1**.

Existing sources of any artificial light or glare in this area, outside of vehicles and roadside signs and lights along I-10, are associated with development previously described. These include the Devers-Palo Verde 500 kV transmission line just south of the Project, the emergency airfield 2 miles to the north, and natural gas transmission infrastructure 5 miles to the east along El Paso Natural Gas Company access road. None are substantial sources of light or glare.

There are no utility-scale solar projects comparable to the Project in the area; therefore, there would be no facilities with the potential to result in solar glare hazards at present.

3.12.2.2 Impacts

No Action

Under the No Action Alternative, trends and actions would occur as described under the affected environment. The Project would not be developed and would not contribute any new potential sources of light or glare.

Proposed Action

Construction

Any nighttime construction activities would require lighting to provide worker safety and to meet applicable requirements. Such lighting could deteriorate nighttime conditions for travelers in the vicinity of the Project. Nighttime construction lighting would, to the extent possible, be limited to active work areas and limited to times when necessary for safety and security. The Construction, Operation, and Maintenance Plan appended to the POD (Jove Solar, LLC 2023) specifies that the lighting plan to be prepared for the Project would describe how lighting would be designed and installed to minimize night sky impacts during facility construction. Specifically, lighting would not exceed the minimum number of lights and brightness required for safety and security, lights would be directed downward or toward the area to be illuminated, and light fixtures would not spill light beyond the Project boundary.

Equipment typically used in construction contains glass and metallic surfaces. Glare from such sources is typically minimal and of low intensity such that it would not affect viewers in nearby areas.

Operation and Maintenance

The operation and maintenance building would have downward pointing/full cutoff nighttime lighting (designed to limit upward light pollution and light pollution across the Project's boundary) to minimize effects on dark night skies. The substation would be equipped with an

outdoor "full cutoff" lighting system, which directs light downward. The lighting plan referenced above would also minimize night sky impacts during facility operation by adhering to the measures previously summarized and requiring switches, timer switches, or motion detectors so that lights operate only when the area is occupied. In general, lighting would be kept off when not in use.

The *Jove Solar Project Visual Resources Technical Report* (AZTEC Engineering 2023a) concludes that the Project would not result in any substantial glare during operation. A separate glare analysis reported in the technical report accounted for the "backtracking" proposed by the Applicant, in which the resting angle of the solar arrays would be a five-degree tilt, as opposed to zero degrees, or flat. The SGHAT output indicated that all glare from the Project would be eliminated from views along the nearest segment of I-10 and from a set of representative observation points differing from the KOPs.

Decommissioning

Similar to the Project's effects during construction, any nighttime activities conducted as part of decommissioning would require lighting to provide worker safety and to meet applicable requirements. Such lighting could deteriorate nighttime conditions for travelers in the vicinity of the Project. However, lighting for any nighttime decommissioning activities would, to the extent possible, be limited to active work areas and limited to times when necessary for safety and security. The Construction, Operation, and Maintenance Plan appended to the POD (Jove Solar, LLC 2023) specifies that the lighting plan to be prepared for the Project would describe how lighting would be designed and installed to minimize night sky effects during facility construction. It further specifies that all mitigation measures developed for the construction phase will be applied to similar activities during the decommissioning phase.

Equipment typically used during decommissioning contains glass and metallic surfaces. Glare from such sources is typically minimal and of low intensity such that it would not affect viewers in nearby areas.

Action Alternative: Wash Avoidance

Construction

While the Wash Avoidance Alternative would slightly reduce the total area within which construction activities would occur, there would be no discernible difference between light and glare effects associated with construction of the Proposed Action and construction of this alternative.

Operation and Maintenance

There would be no substantial difference between operational lighting under the Wash Avoidance Alternative compared with that described for the Proposed Action. Lighting for the operation and maintenance building and substation would be the same, and there would be no substantive difference in Project components to which lighting plan measures would apply.

The same reduced glare effects from the "backtracking" proposed as part of the Project would be realized under the Wash Avoidance Alternative, which would maintain the same development

footprint but have fewer panels without development within 500 feet of either side of the centerline of the desert wash.

Decommissioning

Light and glare effects from decommissioning the Wash Avoidance Alternative would be the same as those described for the Proposed Action and over a smaller area.

Sub-Alternative Options 1 and 2

Impacts from either Option 1 or Option 2 would be of a similar nature to the Proposed Action as the width of the corridor would be consistent, but in Options 1 and 2 the corridor would be longer than the Proposed Action and would impact a larger area.

Cumulative Impacts

Cumulative impacts could occur where the Project is viewed at night in combination with other past, present, and future actions in the same viewshed, which was defined in **Section 3.12.1.2**.

The Atlas North Solar Project, Ten West Link Transmission Line, Cielo Azul Switchyard, and Centennial Flats Solar Project would be located within 2 miles of the Project and would appear in foreground-middleground views. The Ranegras Plains Solar and Storage Project, Bouse Solar and Storage Project, and Socorro Solar Project would be located over 5 miles west of the Project and would appear in background views.

The construction schedule of the Project may overlap with the construction schedule of one or more of these future actions. Though minimized by requirements of the lighting plan, some nighttime construction lighting could be visible within the same views or sequentially as viewers pass through the area within the Project's viewshed. Any such effects would be present only for the duration of construction activities.

Similarly, the operation of the Project and future actions would increase sources of light within foreground-middleground and background views in the Project area. While the Project would not be a substantial source of light or glare, as described above, any light or glare associated with the Project may be visible alongside future actions in fixed views. It may also contribute an insubstantial amount of light or glare visible in succession as viewers travel through the area.

3.12.2.3 Mitigation

Impacts from light and glare will be avoided, minimized, or otherwise addressed by application of the design features identified above in Section 2. The BLM has not identified additional mitigation measures beyond those design features.

3.13 Water and Wetland Resources

The geographic analysis area for wetlands and water resources includes the Project footprint, which would experience temporary and permanent impacts. The scope of the temporal analysis for this resource is the duration of the Project (30 years).

The following resources are analyzed in detail in this section.

- Water and wetland resources

3.13.1 GROUNDWATER RESOURCES

Issue:

- How would groundwater withdrawals needed for the Project affect groundwater quantity in the area?

The following impact indicators were used to analyze this issue:

- Estimated groundwater use by the Project
- Potential decrease in water availability (volume) for water rights sourced from the same aquifer used by the Project

Data sources evaluated in this analysis include the following:

- Groundwater basin analysis for the Project (GSI Water Solutions, Inc. 2023)
- Arizona Department of Water Resources reports for the area (Harquahala Valley Area) (ADWR 2022)
- Arizona Department of Environmental Quality report for the Ranegras Plain Basin (ADEQ 2012)

3.13.1.1 Affected Environment

The Project would be located along the western edge of the Harquahala Plains area, also known as the Harquahala Valley. The ADWR has documented land subsidence in the Harquahala Valley over 14 miles east of the Project (ADWR 2022).

The Project would be located in the Ranegras Plain Basin that covers approximately 912 square miles in western Arizona in La Paz County. There is an estimated 21.7 million acre-feet of water available in the basin (ADEQ 2012). Most of the basin's pumped groundwater is used for irrigation in the central part of the basin. Groundwater levels vary from depths of approximately 30–450 feet. Groundwater elevations fluctuate with irrigation pumping. Natural basin recharge is estimated to be 5,000 acre-feet annually occurring mostly by infiltration of runoff in Bouse Wash and its tributaries.

The Project would be located in the ADWR Harquahala irrigation non-expansion area. The ADWR's irrigation non-expansion area designation means that there are limits on the expansion of irrigated areas. Owners of non-exempt groundwater wells (those pumping over 35 gallons per minute), must have a groundwater withdrawal meter attached to their well and submit annual groundwater usage reports to ADWR.

Trends and Actions

Withdrawals for agriculture and domestic purposes have and would continue to influence groundwater in the Ranegras Plain Basin (ADEQ 2012).

3.13.1.2 Impacts

No Action

Under the No Action Alternative, the trends and actions would continue as described under the affected environment. The Project would not be developed, and groundwater quantity would only be affected by those trends and actions.

Proposed Action

A well would be installed on BLM land within the Project area, and water would be pumped from the well into temporary construction water storage ponds. The water would be used for compaction of electrical trenches and foundations, dust control, wheel washing, and non-potable water for the temporary construction trailer (Jove Solar, LLC 2023).

The Project would require 900 acre-feet of water during the two-year construction period and 159 acre-feet of water during operation of the Project. Water may be withdrawn year-round throughout the two-year construction period. Groundwater withdrawals from the Project would represent approximately 0.00005 percent of the calculated groundwater quantity of the Ranegras Plain Basin and would not result in a measurable impact to the basin or result in potential drawdown or land subsidence issues (GSI Water Solutions, Inc. 2023).

Although construction would use approximately 85 percent of the total water required for the Project, some water use would be required during operation and maintenance and decommissioning for washing of equipment, potable water sources for on-site personnel, ongoing road maintenance, and dust control at a rate of 5.3 acre-feet per year (Jove Solar, LLC 2023). A minimal amount of continuous water use during operation and maintenance would be needed at the office and operation and maintenance buildings. The remaining water uses would withdraw water as needed, with some seasonal variation in water used for dust control. During the two-year decommissioning and reclamation period, water may be used continuously in low quantities for dust control.

Action Alternative: Wash Avoidance

The Wash Avoidance Alternative would result in the same impacts to groundwater in the Ranegras Plain Basin as described for the Project.

Sub-Alternative Options 1 and 2

Impacts from either Option 1 or Option 2 would be of a similar nature to the Proposed Action as the width of the corridor would be consistent, but in Options 1 and 2 the corridor would be longer than the Proposed Action and would impact a larger area.

Cumulative Impacts

The cumulative effects area for groundwater resources is the Ranegras Plain Basin. The impact to groundwater resources from the Project would be approximately 1,059 acre-feet over 30 years. Therefore, when considering adjacent solar development projects and ongoing existing projects in the area that would also use available groundwater in the basin, the Project would result in a

cumulative impact to groundwater resources in the cumulative effects area. However, the effects are not expected to be cumulatively substantial, and the Project's contribution would be minimal.

3.13.1.3 Mitigation

Impacts to groundwater resources will be avoided, minimized, or otherwise addressed by application of the design features identified above in Section 2. The BLM has not identified additional mitigation measures beyond those design features.

3.13.2 WETLAND AND SURFACE WATER RESOURCES

This section analyzes wetlands and surface waters. Certain wetland and surface water issues are analyzed in brief in **Appendix B**.

Issues:

- How would surface hydrology change as a result of the Project?
- How would Project disturbance affect wetlands in the Project area?

The following impact indicators were used to analyze these issues:

- Changes to surface hydrology from any recontouring or compaction of surface soils

Data sources evaluated in this analysis include the following:

- Jove Solar Project, Biological Resources Technical Report (AZTEC Engineering 2023)

The following issues are analyzed in brief in Appendix B.

- How would the Project affect surface water quality through stormwater discharge or disruption of soils and sediments?
- How would the construction and operation of the Project impact surface water runoff by expanding non-permeable surfaces and would this lead to surface erosion?
- How would construction, operation and maintenance, and decommissioning of the Project impact the floodplain's ability to transmit flow?
- How would implementation of the Project affect waters through accidental spills or use of herbicides?
- How would inadvertent spills/leaks during construction and operations affect surface water quality?

3.13.2.1 Affected Environment

The Project area is within the Upper Bouse Wash hydrologic unit code (HUC); HUC-10 watershed (approximately 450 square miles) and is located on an alluvial fan that conveys mostly directional sheet flow toward the approximately east–west oriented sheet flow depression.

Natural surface waters generally flow from northeast to southwest, north of the sheet flow depression, and from southeast to northwest, south of the sheet flow depression. Channelized surface water features are limited to small ephemeral washes and meandering swales where sheet flow concentrates and flows around vegetation. No areas of ponded surface water or perennial or intermittent drainages are present (AZTEC Engineering 2023). According to the University of Arizona web map, there are no floodplains within the Project area, and the closest flood hazard area is nearly 4 miles away (University of Arizona 2023).

AZTEC Engineering (2023) assessed the Project area for potential wetlands. The USFWS National Wetland Inventory (NWI) Wetlands Mapper was accessed February 2022 to identify potential wetlands in the Project area. The NWI Wetlands Mapper identified no ponded surface water features, although several features classified as "R4SBC" under the Cowardian Classification were identified in the Project area. A Cowardian Classification of R4SBC indicates a riverine system that contains flowing water during part of the year, has a streambed, and is seasonally flooded. No persistent wetland hydrology is present in the Project area.

Potential wetlands identified by the NWI data were further reviewed for hydric soils by accessing the NRCS Web Soil Survey in March 2022 (AZTEC Engineering 2023). The Web Soil Survey has no records of hydric soils in the Project area.

Aerial imagery, including National Agriculture Imagery Program imagery dated 2017, ESRI World Imagery dated June 19, 2021, and Google Earth Imagery dated November 2015, was reviewed to identify areas of potential riparian vegetation that could be classified as hydrophytic in the Project area. No areas with potential hydrophytic vegetation were identified (AZTEC Engineering 2023).

No potential wetlands with the three necessary characteristics to be considered waters of the U.S. are present in the Project area (AZTEC Engineering 2023).

Trends and Actions

Existing land uses have and would continue to influence any existing wetlands and surface waters in the analysis area through ground disturbance, impervious surfaces, fill, flow alteration, introduction of invasive species, and conversion of open space to agriculture or rural residential. The analysis area is currently undeveloped, vacant land with several existing two-track roads crossing through the Project area.

3.13.2.2 Impacts

No Action

Under the No Action Alternative, the trends and actions would continue as described under the affected environment. The Project would not be developed; and wetland and surface water resources would only be affected by those trends and actions.

Proposed Action

Project siting and Design Features (**Section 2.5.5**) would avoid and minimize placement of infrastructure in stream features indicated by the NWI data to the extent practicable. However, roads, electrical lines (which may be underground or overhead), or other Project infrastructure

would cross some of these features. Work areas may require disturbance within some of these features. The actual number of riverine features that would be impacted would be determined for the Project's Clean Water Act Section 404 USACE permit once an alternative is selected and final wetland surveys are completed.

During operation, ground disturbance in drainages would occur as needed for maintenance in work areas. However, this ground disturbance would occur in areas previously disturbed during Project construction.

Decommissioning activities would have similar or lesser effects on stream features indicated by the NWI data as construction and ground disturbance would occur in areas previously disturbed during construction. The roads in the Project area would be used to remove infrastructure and could be reclaimed.

Any ground disturbance in stream features indicated by the NWI data could change their function, change the rate and quantity of runoff from the fill footprint, compact soils, and alter flow patterns. Following decommissioning and successful reclamation (for example, recontouring and reconnecting hydrology, as needed), these stream features would be returned as close as possible to their natural state.

In addition to the Design Features, the Project would require the development and implementation of a SWPPP, a Hazardous Materials and Waste Management Plan, and a Spill Prevention Control and Countermeasures Plan to minimize and avoid potential impacts to 1) surface water quality through stormwater discharge or disruption of soils and sediments, 2) surface water runoff due to expansion of non-permeable surfaces that could lead to surface erosion, and 3) inadvertent spills/leaks during construction and operation and maintenance that could impact surface water quality. In addition, if jurisdictional wetlands or waters of the U.S. were identified in the Project area and were impacted, a USACE permit would be required for the Project.

Action Alternative: Wash Avoidance

All Design Features described for the Proposed Action would be applied to the Wash Avoidance Alternative, but this Action Alternative would avoid construction within the desert wash that crosses the Project from southwest to northeast **(Figure 2-3)**. Avoiding construction in the wash would minimize impacts to the identified surface water resources in that portion of the Project area.

Sub-Alternative Options 1 and 2

Impacts from either Option 1 or Option 2 would be of a similar nature to the Proposed Action as the width of the corridor would be consistent, but in Options 1 and 2 the corridor would be longer than the Proposed Action and would impact a larger area.

Cumulative Impacts

The cumulative effects area for the Project is the HUC-10 Upper Bouse Wash watershed. The Project, in combination with trends and actions in the analysis area, could impact wetlands and surface water resources. However, because few surface water resources occur in the area and

because other project developers would work to site projects to avoid wetlands and surface waters to the extent practicable, there would be some cumulative impacts; but the effects are not expected to be substantial.

3.13.2.3 Mitigation

Impacts to wetlands and surface waters will be avoided, minimized, or otherwise addressed by application of the design features identified above in Section 2. The BLM has not identified additional mitigation measures beyond those design features.

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4 Consultation and Coordination

4.1 Introduction

In addition to planning, reviewing data sources, analyzing potential environmental effects, and preparing this EIS, the BLM also conducts consultation and coordination to foster engagement between the BLM and other cooperating federal, state, regional, and local agencies, as well as Tribal Nations, consulting parties, and potentially affected authorized users. The BLM solicits input from these parties to assist in its analysis and decision-making. The BLM has made formal and informal efforts to involve, consult with, and coordinate with these entities to gather and analyze the most appropriate data, and to see that agency policy and stakeholder concerns are considered and incorporated.

4.2 Public Involvement Process

The BLM published an NOI, observed a 45-day public scoping period for the Project, held two public scoping meetings, and prepared a Scoping Report.

For full details regarding public involvement, please see Chapter 1.

4.3 Cooperating Agencies

The BLM solicited input from 12 agencies: ADEQ, ADOT, ADWR, Arizona State Historic Preservation Office, ASLD, AZGFD, EPA, Ft. Yuma-Quechan Tribe, La Paz County, U.S. Department of Defense, USACE, and USFWS. Of these, seven agreed to act as Cooperating Agencies: ADOT, AZGFD, EPA, Ft. Yuma-Quechan Tribe, La Paz County, USACE, and USFWS. These Cooperating Agencies provided input on the scope of required analyses, potential adverse effects and areas for analysis, alternatives to the Project, and ways by which the Project might reduce adverse effects. The BLM received comments from four agencies on a prior version of this EIS: ADOT, AZGFD, EPA, and USFWS.

4.3.1 ENDANGERED SPECIES ACT, SECTION 7 CONSULTATION

The BLM is coordinating with USFWS prior to initiating formal consultation under the ESA for potential effects on Yuma Ridgway's rail, Sonoran pronghorn, and monarch butterfly. Consultation will be complete prior to the BLM's issuance of a ROD.

4.3.2 CLEAN WATER ACT, SECTION 404

The BLM is coordinating with USACE concerning the preliminary jurisdictional determination and the Project's avoidance of impacts to regulated wetlands that would otherwise require permitting.

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5 References

Executive Summary

None.

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Chapter 3 Affected Environment and Environmental Consequences

3.1 INTRODUCTION

None.

3.2 AIR QUALITY, GREENHOUSE GASES, AND CLIMATE CHANGE

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Chapter 4 Consultation and Coordination

None.

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Appendix A Acronyms and Abbreviations

°C	degrees Celsius
°F	degrees Fahrenheit
ADEQ	Arizona Department of Environmental Quality
ADOT	Arizona Department of Transportation
ADT	average daily trips
ADWR	Arizona Department of Water Resources
APE	area of potential effect
Applicant	174 Power Global
ASLD	Arizona State Land Department
AUM	animal unit month
AZGFD	Arizona Game and Fish Department
BESS	battery energy storage system
BGEPA	Bald and Golden Eagle Protection Act
BLM	Bureau of Land Management
BMP	best management practice
CAA	Clean Air Act
CAP	Central Arizona Project
CFR	Code of Federal Regulations
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
County	La Paz County
DC	direct current
Draft EIS/EIS	Draft Environmental Impact Statement/Environmental Impact Statement
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ESA	Federal Endangered Species Act
FAA	Federal Aviation Administration
FLPMA	Federal Land Policy and Management Act
GHG	greenhouse gas
HUC	hydrologic unit code
I-10	Interstate 10

KOP	key observation points
kV	Kilovolt
kW	Kilowatt
Laguna Maneuver Area	Laguna Maneuver Area Formerly Used Defense Sites Property
LOS	level of service
MBTA	Migratory Bird Treaty Act
MDP	Monitoring and Discovery Plan
MOA	Memorandum of Agreement
MW	megawatt/megawatts
MWac	megawatts of Alternating Current
MWh	megawatt hour
NAAQS	National Ambient Air Quality Standards
NEI	National Emissions Inventory
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO_2	nitrogen dioxide
NOI	notice of intent
NOx	nitrogen oxides
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWI	U.S. Fish and Wildlife Service National Wetlands Inventory
O_3	ozone
OHV	off-highway vehicle
OSHA	Occupational Safety and Health Administration
Pb	lead
PCBs	polychlorinated biphenyls
PCS	power conversion station
PEIS	Preliminary Environmental Impact Statement
PFYC	Potential Fossil Yield Classification
PM	particulate matter
PM_{10}	particulate matter 10 microns diameter or less
$PM_{2.5}$	particulate matter 2.5 microns diameter or less
POD	plan of development
Project	Jove Solar Project
Proposed Action	right-of-way grant
PRPA	Paleontological Resources Preservation Act
PSD	prevention of significant deterioration
PV	photovoltaic

RDEP	Restoration Design Energy Project
REDA	Renewable Energy Development Area
RMP	Resource Management Plan
ROD	Record of Decision
ROW	right-of-way
RV	Recreational vehicle
SCADA	supervisory control and data acquisition
SEZ	solar energy zone
SGHAT	Solar Glare Hazard Analysis Tool
SO_2	sulfur dioxide
SQRU	Scenic Quality Rating Unit
SR	State Route
SWPPP	stormwater pollution prevention plan
T/E	threatened and endangered species
US-60/US-95	U.S. Highway 60/U.S. Highway 95
USACE	U.S. Army Corps of Engineers
USC	U.S. Code
UCSB	United States Census Bureau
USFWS	U.S. Fish and Wildlife Service
UXO	unexploded ordnance
VRI	visual resource inventory
VRM	visual resource management
WEAP	worker environmental awareness program
WHA	wildlife habitat area
WSA	wilderness study area
YFO	Yuma Field Office

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Appendix B Issues Analyzed in Brief

Resources with the potential to be affected by the Jove Solar Project (Project) were discussed with subject matter experts at the Bureau of Land Management and Cooperating Agencies. The Jove Solar Environmental Impact Statement (EIS) analyzes these substantive issues. Other issues were evaluated through internal and external scoping, eliminated from detailed analysis in the EIS, and are analyzed in brief in this appendix for one or more of the following reasons:

- The resource in question is not present in the analysis area, or the concern would not result from the Project.
- Design Features or other mitigations would eliminate adverse effects, or reduce effects to below significance.
- The impact context is so low that a detailed analysis was not needed to determine significance.

The following issues were analyzed in brief and the rationale for dismissing these issues from detailed analysis is provided. In compliance with 40 Code of Federal Regulations 1502.2(b), the EIS "discuss[es] impacts in proportion to their significance" and has "only brief discussion of other than significant issues." (**Table B-1**).

Table B-1. Issues Dismissed from Detailed Analysis in the Environmental Impact Statement and Analyzed in Brief.

Resource or Concern	Issue Statement	Rationale for Eliminating from Detailed Analysis
Fire and fuels	How would Project construction, operation or decommissioning activities increase the risk for establishment and spread of non-native or noxious plant species, and ultimately fuel loading and fuel connectivity?	The Project would include several Design Features to prevent the spread of noxious weeds and non-native vegetation and would restore all areas temporarily impacted by Project construction with native plant species. Therefore, the Project would have no impact.
Fire and fuels	How would Project construction, operation or decommissioning activities affect the risk of (human- or natural-caused) wildfire ignition in the Project area?	The Project area has experienced only infrequent fires. The Project would include fire prevention plans and other Design Features and would not include "hot work." The area supports mostly sparse desert vegetation and lacks dense vegetation or a litter layer that may allow fire spread. Therefore, the proposed mitigation would reduce impacts below significance.

Resource or Concern	Issue Statement	Rationale for Eliminating from Detailed Analysis
Recreation	What levels of human presence or noise during construction activities could impact the quality of hunting opportunities on the Project site?	Access to hunting areas surrounding the Project would not be altered during construction or operation of the Project given the AT&T Frontage Road would remain open. Hunting within the Project area would not be allowed; however, the 3,495 acres of the Project represents an insignificant area compared to 1,189,857 acres of surrounding BLM lands that are within the Yuma field office jurisdiction and will continue to provide hunting opportunities. Noise generated during construction could have a temporary impact to hunting on the lands immediately adjacent to the Project; however, hunting opportunities in this area are no different than those on the remainder of the BLM Yuma field office managed lands. Therefore, the Project would have negligible impact.
Recreation	Which, if any, existing recreation opportunities within or around the Project site would the Project temporarily or permanently conflict with or preclude?	The Project would not preclude access to surrounding hunting and off-highway vehicle (OHV) recreation opportunities via the AT&T Frontage Road that would remain open to the public during construction and operation of the Project. Recreation within the Project area would not be allowed; however, the hunting and recreation opportunities present within the Project area are no different than those in the surrounding areas. Therefore, the Project would have negligible impact.
Recreation	How would Project construction and permanent infrastructure such as towers, guy wires, and fencing impact OHV use?	The AT&T Frontage Road would remain open during construction and operation of the Project. Therefore, OHV use surrounding the Project, as well as access to OHV-designated areas would not be inhibited by the Project.
Solid Wastes	How would solid wastes generated by the Project (packaging materials and employee-generated wastes) be managed? Would they exceed capacities of approved disposal facilities?	Jove Solar, LLC would develop and implement a Waste Management Plan as part of the Health and Safety Plan (Appendix H of Jove Solar, LLC [2023]) that would provide storage, use, transportation, and disposal protocols. These plans would evaluate existing capacities and include Jove Solar, LLC's commitment to work with La Paz County and Arizona to identify disposal facilities if additional capacity is deemed necessary in the future. Therefore, the proposed mitigation would reduce impacts below significance.
Hazardous Materials	How would hazardous materials and wastes generated by the Project be managed? Would they exceed capacities of approved disposal facilities?	Jove Solar, LLC would develop and implement a Hazardous Materials Management Plan and a Waste Management Plan (Appendix H of Jove Solar, LLC [2023]). These plans would address storage, use, transportation, disposal protocols, BMPs, inspection and training protocols, and emergency response procedures for hazardous materials and wastes. These plans would evaluate capacities and include Jove Solar, LLC's commitment to work with La Paz County and Arizona to identify disposal facilities if additional capacity is deemed necessary in the future. Therefore, the proposed mitigation would reduce impacts below significance.

Resource or Concern	Issue Statement	Rationale for Eliminating from Detailed Analysis
Land Use	How would the Proposed Action or Action Alternatives impact agricultural uses?	The Project area is undeveloped, and there are no active agricultural uses on the Project area. Grazing is discussed in **Section 3.9**.
Land Use	How would the Proposed Action or Action Alternatives potentially conflict with Federal Aviation Administration (FAA) or local aviation uses?	The Salome Emergency Airfield is located approximately 0.6 mile north of the Project. This airfield is considered abandoned and only used in an emergency. Within 20 miles of the Project, there are three landing strips used only by private aircrafts. The Salome Airport and associated airparks are located approximately 14 miles to the north–northwest; the 75E Airport is located 10 miles to the northeast; and the Eagletail Ranch landing strip is located approximately 18 miles to the southeast of the Project. The Project is neither at nor near any Federally obligated airport or U.S. Department of Defense facility. The tallest overhead structures would be 40–80 feet tall, depending on terrain and easement configuration. As discussed in **Chapter 2**, design for the Project would adhere to all FAA and International Civil Aviation Organization regulations. Therefore, there are no known aviation conflicts expected with the installation or operation of the Project.
Land Use	Would the presence of new structures impact any areas of critical environmental concern (ACECs) that have been designated for their visual values?	The closest ACEC to the Project is Big Maria Mountains ACEC over 50 miles west. The Project would have no impact.
Public Health and Safety	Would the Proposed Action or Action Alternatives change the risks of site security during construction or operations and maintenance?	For areas where public safety risks could exist and site personnel will not be available 24/7 to control public access (such as excavated foundation holes and electrical distribution system trenches), warning signs and temporary fences or flagging will be erected. Fencing also may be installed around material storage, staging, and laydown areas. Other areas determined to be hazardous or where issues of security or theft are of concern also may be fenced in coordination with the BLM. Temporary fencing around unfinished excavations and other potential hazards typically will consist of a high-visibility plastic mesh or red/yellow danger tape. The Applicant also may use security guards, cameras, and/or additional fencing, if necessary, to protect public health and safety and Project facilities. The Project would be fenced as required by National Electric and National Safety Codes to prevent unauthorized access to energized components. The Project also will be marked with warning and no trespassing signage on fences, gates, and electrical equipment. All gates, access doors, and ports will be always locked. Therefore, effects to site access and security would be negligible.

Resource or Concern	Issue Statement	Rationale for Eliminating from Detailed Analysis
Public Health and Safety	Would the Proposed Action or Action Alternatives change the risks to OHV use in the area?	The Project is in a limited OHV Management Area under the applicable BLM Resource Management Plan (BLM 2010). While the largest concentration of nearby OHV users would be in Quartzsite, there is potential for OHV users in the Project area, specifically along the AT&T Frontage Road. However, there are adequate alternative lands available and therefore, there would be no change in the risks to OHV use in the area.
Public Health and Safety	Would the Proposed Action or Action Alternatives change the electric and magnetic fields (EMF) risks in the area?	The Project location is located on BLM land, and there are no residences within the Project or nearby area. Therefore, there would be no direct or indirect impacts to public health and safety from EMF.
Public Health and Safety	Would the Proposed Action or Action Alternatives change the hazardous materials and waste risks in the area?	A Hazardous Materials and Waste Management Plan would be prepared to address selection, transportation, storage, and use of all hazardous materials needed for construction, operation, and decommissioning of the facility for local emergency response services, public safety authorities, and the regulating agency. The plan would also address the characterization, on-site storage, recycling, and disposal of all resulting wastes. The plan would outline specific preventive measures to be followed to reduce the likelihood of an accidental release of a hazardous or regulated liquid during construction activities. The goal of the plan would be to minimize and contain the potential for a spill of these hazardous and regulated liquid materials and to provide prompt response measures for any spills that may occur. With implementation of the plan, construction of the Project would not result in any effects from hazardous materials.
Public Health and Safety	How would the Proposed Action or Action Alternatives potentially change the aviation risks in the area?	The tallest Project structures would be the transmission line overhead structures, which would be only 40–80 feet tall, depending on terrain and easement configuration. The structure design for the Project would adhere to all FAA and International Civil Aviation Organization regulations. Therefore, no adverse aviation impacts would be expected.
Mineral Resources and Mining	How would development of the Project impact mineral resources?	There are no identified mineral resources or mining claims near the Project (U.S. Geological Survey 2023). The Project would have no impact on mineral resources.
Geohazards	How would development of the Project impact geohazards?	There are no identified landsides, earth fissures, quaternary faults, or flood hazard zones in the Project area (University of Arizona 2023). The closest land subsidence is over 14 miles east of the Project (ADWR 2022). There are no identified expansive clays in the La Paz County area (Geosciences News and Information 2023). The Project would have no impact on geohazards.

Resource or Concern	Issue Statement	Rationale for Eliminating from Detailed Analysis
Water Resources	How would the Project affect surface water quality through stormwater discharge or disruption of soils and sediments?	Jove Solar, LLC, would develop a Stormwater Pollution Prevention Plan (SWPPP) (Appendix K of Jove Solar, LLC 2023) for the site to provide compliance with applicable regulations, and the potential for off-site migration of contaminated stormwater or increased soil erosion would be minimized. The SWPPP would provide temporary and permanent sediment and erosion control designs and would identify practices to control erosion and sediment and treat and monitor stormwater (if necessary). Design Features to help control erosion during construction would avoid or minimize sedimentation and stormwater runoff from the Project. Erosion controls that comply with county, State, and Federal standards would be applied. Any modifications to access roads would be designed so that changes to surface water runoff are avoided and erosion is not initiated. Access roads would be located away from drainage bottoms and would avoid wetlands. If drainage bottoms and wetlands cannot be avoided, appropriate Design Features would be used to reduce erosion and sedimentation. Additional Project-specific measures would require that all Jove Solar, LLC's stormwater and erosion measures be implemented throughout the life of the Project. With these measures in place, surface water would not be affected by stormwater runoff or sedimentation.
Water Resources	How would the construction and operation of the Project impact surface water runoff by expanding non-permeable surfaces and would this lead to surface erosion?	The Project would result in 45 acres of non-permeable surfaces (that is, secured areas for receiving and storing Project materials, water storage ponds, four to five temporary construction trailers with temporary electrical service and sanitation facilities, and parking for work trucks and personal vehicles for the construction crews), depending on the alternative selected. This would be 1 percent of the overall Project area and even less of the watersheds in which the non-permeable surfaces would be constructed. Because the additional volume of runoff from these surfaces would be small and Design Features would further minimize changes to surface water runoff and maintain water conveyance flows, the effects would be small enough to be discountable. The Project would not use surface water during any phase. There would not be impacts to surface water quantity.
Water Resources	How would construction, operation and maintenance, and decommissioning of the Project impact floodplain ability to transmit flow?	There are no mapped floodplains in the Project area (University of Arizona 2023). The Project would have no impact on floodplain ability to transmit flow.

Resource or Concern	Issue Statement	Rationale for Eliminating from Detailed Analysis
Water Resources	How would implementation of the Project affect waters through accidental spills or use of herbicides? How would inadvertent spills/leaks during construction and operations affect surface water quality?	Jove Solar, LLC would develop and implement a Hazardous Materials Management Plan and a Waste Management Plan as part of the Health and Safety Plan (Appendix H of Jove Solar, LLC, 2023), and a Spill Prevention, Control, and Countermeasures Plan to minimize and avoid the potential risk of surface and groundwater contamination from inadvertent spills and leaks. These plans would address storage, use, transportation, and disposal protocols, inspection and training protocols, and emergency response procedures. Secondary containment would be provided for all on-site hazardous materials and waste storage, including fuel. With these plans and prevention measures in place, the risk of potential impacts to surface and groundwater quality from inadvertent leaks or spills would be low. Jove Solar, LLC would comply with the applicable Federal and State laws and regulations concerning the use of herbicides and other similar substances in all activities and operations. Prior to the use of herbicides, Jove Solar, LLC would obtain from the BLM written approval of a plan showing the type and quantity of material to be used, pest(s) to be controlled, method(s) of application, and any other information deemed necessary. Herbicides would not be permanently stored on public lands, and applicator(s) would hold a current applicator's license or be under the direct supervision of a licensed applicator. Jove Solar, LLC would provide an annual report to the BLM to report type and quantities of herbicides applied to public lands.

Key: **ACEC** = area of critical environmental concern, **BLM** = Bureau of Land Management, **EIS** = environmental impact statement, **EMF** = Electric and Magnetic Fields, **FAA** = Federal Aviation Administration, **OHV** = off-highway vehicle, **Project** = Jove Solar Project, **SWPPP** = Stormwater Pollution Prevention Plan,

B.1 Appendix B References Cited

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Appendix C Restoration Design, Energy Project (Appendix B)

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APPENDIX B

DESIGN FEATURES, REQUIRED PLANS, AND BMPS

APPENDIX B
DESIGN FEATURES, REQUIRED PLANS, AND BMPS

This section provides an overview of Restoration Design Energy Project (RDEP) Design Features and Best Management Practices (BMPs) associated with siting and design, construction, operation and maintenance, and decommissioning of renewable energy projects. Design features are requirements that must be met by the applicant and must be incorporated into project-specific Plans of Development (PODs), Plans of Operations, and rights-of-way (ROW) grants. In general, the design features are accepted practices that are known to be effective when implemented properly at the project level. However, their applicability and overall effectiveness cannot be fully assessed except at the project-specific level when the project location and design are known. Design features would establish the minimum specifications for renewable energy projects and mitigate adverse impacts and would be applied as appropriate to the location of, and type, scale, and technology used in a development.

All of the design features identified in the Final Solar Programmatic Environmental Impact Statement (PEIS) would be applied to solar development in Arizona. In addition, **Table B-1**, Design Features, lists design features that would be unique to RDEP. These measures are organized by major resource topics and identify the phase(s) during which each measure would be implemented: S – siting and design; C – construction; O – operation and maintenance; and D – decommissioning and reclamation. Many of the potential design features indicate the need for project-specific plans or studies. The plans are included in **Table B-2**, Required Plans, and the studies are included in **Table B-3**, Required Studies. The content and applicability of these plans and studies will depend on specific project requirements and locations; however, some guidance is provided for what to include in specific plans. The authorizing officer would need to determine the adequacy of such plans or studies before approving a specific project.

Best management practices provided in **Table B-4**, Best Management Practices, are state-of-the-art mitigation measures applied on a site-specific basis to avoid, minimize, reduce, rectify, or compensate for adverse environmental or social impacts. They are selectively applied to projects to aid in achieving desired outcomes for safe, environmentally responsible development, by preventing, minimizing, or mitigating adverse impacts and reducing conflicts. BMPs can also be proposed by project applicants for activities on public lands (e.g., for solar and wind development). BMPs not incorporated into the permit application by the applicant may be considered and evaluated through the environmental review process and incorporated into the use authorization as conditions of approval or rights of way stipulations.

Design features and BMPs would apply to solar and wind projects, as applicable based on the technology used, and on all BLM-administered lands in Arizona that are available for application, including REDAs and SEZs.

Table B-1
Design Features

No.	Topic	Description of Measure	Phase
Air Quality			
1	Emissions	Staging and queuing areas will not be located within 1,000 feet of sensitive receptors.	C, O, D
2	Fugitive dust	All soil disturbance activities and travel on unpaved roads shall be suspended during periods of high winds. A critical site-specific wind speed shall be established based on soil properties determined during site characterization, and wind speed monitoring would be required at the site during construction, operation, and reclamation.	C, O, D
Aviation			
3	Restricted airspace	In applications to appropriate lead agencies, provide a copy of a letter stating that the proposed project is compatible with the Airport Land Use Compatibility Plan. The following locations and design features may contribute to a decision that the facility is incompatible with operations of a nearby airport: • Siting the facility within 5,000 feet from a heliport or 20,000 feet (3.8 miles) of a runway that is at least 3,200 feet in actual length. • Locating portions of a facility within a designated airport safety zone, airport influence area, or airport referral area. • Introducing a thermal plume, visible plume, glare, or electrical interference into navigable airspace on or near an airport. • Proposing a structure that will exceed 200 feet in height above ground level.	S
4	Restricted airspace	Consult with the FAA regarding the heights of the project structures and avoid conflicts with aviation. Design the project to comply with FAA regulations, including lighting regulations, and to avoid potential safety issues associated with proximity to airports or landing strips.	S

Table B-1 *(continued)*
Design Features

No.	Topic	Description of Measure	Phase
Cultural Resources			
5	Cultural surveys	A phased sampling strategy, beginning with a Class II inventory to assess various alternative development areas, is recommended prior to the selection of individual project locations. Class II inventory shall meet the standards set forth in the Secretary of Interior's Standards and Guidelines for Archaeology and Historic Preservation (48 FR 44716), BLM Handbook H-8110: Guidelines for Identifying Cultural Resources (BLM 2002), and revised BLM Manual 8110 (BLM 2004).	S
6	Cultural surveys	Develop and implement a survey plan to conduct a Class III inventory in accordance with BLM and SHPO standards. Levels of inventory will be sufficient to identify and evaluate resources that could be directly or indirectly affected by the proposed project, associated facilities, and access roads.	
7	Cultural surveys	Following field surveys ensure the survey report documents previously unrecorded and newly discovered resources information. Provide information necessary for evaluating each newly discovered resource's eligibility for the NRHP. Ensure the cultural resources specialist completes a technical report detailing the records search results, each survey's methods and results, including identified resources evaluations, and recommendations for resource evaluations based on the NRHP eligibility criteria. The reports should meet the lead agency's or agencies' published standards.	S
8	Cultural surveys	Retain the services of a geoarchaeologist, when appropriate, to investigate and complete a geomorphology technical report. Include the following elements: • Reconstruct the historical geomorphology of the project's Area of Potential Effects (APE); • Map and date the sediments of the landforms in that area; • Assess whether buried archaeological deposits may be present and subject to project impacts.	S
9	Monitoring and Mitigation	Retain a qualified cultural resources specialist to write and carry out a monitoring and mitigation plan or agreement, when applicable, and to be available if cultural resources are encountered during construction. Avoidance of known cultural resources is generally the preferred resolution option; include in the plan measures to protect avoided resources during construction and to prevent looting/vandalism and erosion. If project impacts to known NRHP-eligible cultural resources are unavoidable, data recovery may be approved as a mitigation measure; include a data recovery strategy in the plan. The project developer may also be asked by the appropriate lead agency to include additional measures for addressing the discovery of previously unknown cultural resources during construction. Consider the following measures, at a minimum: • Hire a qualified archaeological monitor to oversee project excavations and to monitor resources that will be protected from disturbance by construction-related activities. • Develop and use a cultural resources construction personnel training program to promote cultural resources identification and lawful and appropriate response to discoveries.	C, O, D

Table B-1 *(continued)*
Design Features

No.	Topic	Description of Measure	Phase
		• Notify involved agencies of unexpected cultural or historical resources discoveries during construction. The project developer may be asked or ordered to cease construction in the vicinity of the discovery to allow evaluation by an agency archaeologist and formulation of appropriate mitigation measures. • If human remains are discovered, cease construction and consult with the lead agencies. It is advisable to prepare a Plan of Action to address anticipated or unanticipated discoveries of materials protected under the Native American Graves Protection and Repatriation Act (NAGPRA), even if such discoveries appear to be unlikely on the basis of the survey results. • Where project construction would directly and adversely affect NRHP eligible properties, scientific data recovery may be selected as an appropriate mitigation measure. Data recovery procedures shall be conducted in accordance with an agency-approved Data Recovery Plan including a detailed research design and methodology. • Have the cultural resources specialist prepare a report documenting archaeological monitoring and data recovery activities.	
10	Treatment plans	In accordance with applicable Section 106 agreement documents and NEPA analyses, prepare and implement cultural resource management plans (including Historic Properties Treatment Plans) to avoid, mitigate, or otherwise resolve adverse effects in consultation with the SHPO, Indian tribes, project applicant, and other consulting parties. Treatment plans will guide: • Completion of any supplemental surveys needed to address refinements in the final project design to ensure full coverage of areas that could be affected.. • Outstanding geoarchaeological investigations. • Evaluation of newly identified cultural resources for NRHP eligibility. • Assessment of project impacts to NRHP-eligible cultural resources. • Implementation of site avoidance, monitoring, data recovery, reduction of visual impacts, or other measures developed to mitigate adverse impacts.	C, O, D
Designated Areas with Wilderness Characteristics			
11	Unique/ important areas	Locating renewable energy facilities in areas of unique or important cultural, recreation, wildlife, or visual resources shall be avoided, even if they do not possess a special area designation.	S
Ecological			
12	Training	Develop a project-specific worker environmental awareness program (WEAP) that meets the approval of the permitting agencies and would be carried out during all phases of the project (site mobilization, ground disturbance, grading, construction, operation, closure/decommissioning, or project abandonment, and	C, O, D

Table B-1 *(continued)*
Design Features

No.	Topic	Description of Measure	Phase
		restoration/reclamation activities). Identify in the WEAP biological resources and BMPs for minimizing impacts to resources. Provide interpretation for non-English speaking workers, and provide the same instruction for new workers prior to their working onsite. Keep in project field construction office files the names of onsite personnel (for example, surveyors, construction engineers, employees, contractors, contractor's employees, subcontractors) who have participated in the education program. At a minimum, include the following in the program: • Photos and habitat descriptions for special status species that may occur on the project site and information on their distribution, general behavior, and ecology. • Species sensitivity to human activities. • Legal protections afforded the species. • Project BMPs for protecting species. • State and federal law violation penalties. • Worker responsibilities for trash disposal and safe/humane treatment of wildlife and special status species found on the project site, associated reporting requirements, and specific required measures to prevent taking of threatened or endangered species. • Handout materials summarizing the contractual obligations and protective requirements specified in project permits and approvals. • Project site speed limit requirements and penalties.	
13	Construction	If needed, temporary access roads shall be developed primarily through the removal of woody vegetation, although temporary timber mats should be used in areas of wet soils. Wide-tracked or balloon-tired equipment, timber corduroy, or timber mat work areas shall be used on wet soils, where wetland or stream crossings are unavoidable and when crossing on frozen ground is not possible in winter.	C, O, D
14	Blasting	The occurrence of flyrock from blasting shall be limited by using blasting mats.	C, D
15	Traffic	Any vehicle-wildlife collisions or carrion shall be immediately reported to security or the on-site biological monitor. Observations of potential wildlife problems, including wildlife mortality, shall be immediately reported to the BLM or other appropriate agency authorized officer. Procedures for removal of wildlife carcasses on-site and along access roads shall be addressed in the Animal, Pest, and Vegetation Control Plan, to avoid vehicle-related mortality of carrion-eaters.	C, O, D
16	Lighting	Towers that require lighting for aviation safety shall comply with the USFWS communications tower guidance. Unless otherwise required by the Federal Aviation Administration (FAA), only white (preferable) or red strobe lights shall be used at night, and these shall be the minimum number and minimum intensity allowable by the FAA. The strobes should be on for a brief a period as possible and the time between strobe or flashes should be the	S, C, O, D

Table B-1 *(continued)*
Design Features

No.	Topic	Description of Measure	Phase
		longest possible. Synchronize strobes so that a strobe effect is achieved and towers are not constantly illuminated. The use of solid red or pulsating red warning lights at night shall be avoided. Current research indicates that solid or pulsating (beacon) red lights attract night-migrating birds at a much higher rate than white strobe lights. Red strobe lights have not yet been studied.	
17	Lighting	Keep lighting at operation and maintenance facilities and substations located within 0.5 mile of the turbines to the minimum required for meeting FAA guidelines, and safety and security needs.	S, C
18	Road construction	If the need for using surfacing, road sealant, soil bonding, and stabilizing agents on non-paved surfaces is determined use agents that have been shown to be non-toxic to wildlife and plants.	C, O, D
19	Cattle guards	If cattle guards are identified for the design for new roads, they shall be wildlife friendly. To the extent practicable, improvements shall be made to existing ways and trails that require cattle to pass through existing fences, fence-line gates, new gates, and standard wire gates alongside them.	S
20	Trenches	Because open trenches could impede the seasonal movements of large game animals and alter their distribution, they shall be backfilled as quickly as is possible. Open trenches could also entrap smaller animals; therefore, escape ramps shall be installed at regular intervals along open-trench segments at distances identified in the applicable land use plan or best available information and science. Additionally, an appropriate number of qualified biological monitors (as determined by the federal authorizing agency and the USFWS) shall be on-site to monitor, capture, and relocate animals that become entrapped in trenches and are unable to escape on their own.	C, O, D
21	Aquatic habitat	If transmission lines are located near aquatic habitats or riparian areas (e.g. minimum buffers identified in applicable land use plan or best available science and information), vegetation maintenance shall be limited and performed mechanically rather than with herbicides. Cutting in wetlands or stream and wetland buffers shall be conducted by hand or feller-bunchers. Tree cutting in stream buffers shall only target trees able to grow into a transmission line conductor clearance zone within 3 to 4 years. Cutting in such areas for construction or vegetation management shall be minimized, and the disturbance of soil and remaining vegetation shall be minimized.	S, C
22	Habitat	A habitat restoration plan shall be developed to avoid, minimize, or mitigate negative impacts on vulnerable wildlife while maintaining or enhancing habitat values for other species. The plan shall identify reclamation, soil stabilization, and erosion reduction measures that shall be implemented to ensure that all temporary use areas are restored. The plan shall require that restoration occur as soon as possible after completion of activities, provided such revegetation will not compromise the function of any buried utilities, to reduce the amount of habitat converted at any one time and to speed up the recovery to natural habitats. Species salvaged during construction could be transplanted into these areas at a density similar to pre-construction conditions. Revegetation shall focus on the establishment of native plant communities similar to those present in the vicinity of the project site. Species used shall consist of native species dominant within the plant communities existing in adjacent areas having similar soil conditions. Certified weed-free seed mixes of native shrubs, grasses, and forbs of	S

Table B-1 *(continued)*
Design Features

No.	Topic	Description of Measure	Phase
		local origin shall be used. In areas where suitable native species are unavailable, other plant species approved by BLM could be used. The restoration plan shall include adaptive management and a monitoring plan. The monitoring plan will establish success thresholds.	
23	Wildlife	Meteorological towers and solar sensors shall be located to avoid sensitive habitats or areas where wildlife are known to be sensitive to human activities (e.g., sage grouse; refer to applicable land use plan or best available information and science to determine avoidance distances). Installation of these components shall be scheduled to avoid disruption of wildlife reproductive activities, migratory behaviors, or other important behaviors. The area disturbed by installation of meteorological towers (i.e., footprint) shall be kept to a minimum.	S, C
24	Wildlife timing	Activities shall be timed to avoid, minimize, or mitigate impacts on wildlife. For example, crucial winter ranges for elk, deer, pronghorn, and other species shall be avoided especially during their periods of use.	S, C, O, D
25	Birds/bats	Avian and bat use surveys consistent with current methodologies and standards shall be conducted; the amount and extent of ecological baseline data required shall be determined on a project basis.	S
26	Eagles	At the project level, recommendations contained in the Interim Golden Eagle Technical Guidance: Inventory and Monitoring Protocol; and Other Recommendations in Support of Golden Eagle Management and Permit Issuance (Pagel et al. 2010) shall be considered in project planning, as appropriate. Additionally, the Bald and Golden Eagle Protection Act–Golden Eagle National Environmental Policy Act and Avian Protection Plan Guidance for Renewable Energy (Instruction Memorandum No. 2010-156) will need to be adhered to until programmatic permits from the USFWS are available. This memorandum requires that consideration of golden eagles and their habitat be incorporated into site-specific NEPA analysis for all renewable energy projects and determine whether the project has the potential to affect golden eagles or their habitat. It must be determined whether breeding territories/nests, feeding areas, roosts, or other important golden eagle use areas are located within the analysis area. The analysis shall be made in coordination with the USFWS and AGFD. If the proposed project has the potential to affect golden eagles or their habitat, an analysis shall be completed that includes: (1) direct and indirect effects analysis; (2) cumulative effects analysis; (3) BMPs; (3) avian protection plans; (4) interagency coordination; and (5) record of decision, decision record, and notice to proceed.	S
27	Raptors	Operators shall determine the presence of active raptor nests (i.e., raptor nests used during the breeding season) and design the project to provide for spatial buffers and timing restrictions for surface disturbing activities. Operators shall coordinate with AGFD to help determine the appropriate survey methods. Measures to reduce raptor and/or raptor prey species use at a project site (e.g., minimize road cuts, maintain either no vegetation or plant species that are unattractive to raptors around the turbines) shall also be identified.	S
28	Special status species	The capability of local surface water or groundwater supplies to provide adequate water for operation of proposed solar facilities shall be considered early during project siting and design. Technologies that would result in large withdrawals that would affect water bodies that support ESA-listed species shall not be considered.	S

Table B-1 *(continued)*
Design Features

No.	Topic	Description of Measure	Phase
29	Desert tortoise	Ensure the biologist inspects construction pipes, culverts, or similar structures: (a) with a diameter greater than 3 inches, (b) stored for one or more nights, (c) less than 8 inches aboveground, and (d) within desert tortoise habitat (such as outside the permanently fenced area), before the materials are moved, buried, or capped. As an alternative, cap such materials before storing outside the fenced area or placing on pipe racks. Avoid inspection or capping if the materials are stored within the permanently fenced area after completing desert tortoise clearance surveys.	C, D
30	Cactus	As directed by the local BLM field office, Joshua trees (*Yucca brevifolia*), other Yucca species, and most agave and cactus species, shall be salvaged prior to land clearing, and transplanted, held for use in revegetating temporarily disturbed areas, or otherwise protected as prescribed by state or local BLM requirements.	C, O, D
31	Noxious weeds	An Integrated Vegetation Management Plan shall be developed that is consistent with applicable regulations and agency policies for the control of noxious weeds and invasive plant species. The plan shall address monitoring; ROW vegetation management; the use of certified weed-free seed and mulching; the cleaning of vehicles to avoid the introduction of invasive weeds; and the education of personnel on weed identification, the manner in which weeds spread, and the methods for treating infestations. The plan shall investigate possibilities of revegetating parts of the renewable energy project area. Where revegetation is accomplished, fire breaks shall be required such that vegetated areas would not result in increased fire hazard. For transmission line ROWs, the plan shall be consistent with the existing vegetation management plan for that ROW. Principles of integrated pest management, including biological controls, shall be used to prevent the spread of invasive species. The plan shall include periodic monitoring, reporting, and immediate eradication of noxious weed or invasive species occurring within all managed areas. A controlled inspection and cleaning area shall 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. To prevent the spread of invasive species, project developers shall work with the local BLM field office to determine whether a pre-activity survey is warranted, and if so, conduct the survey. If invasive plant species are present, project developers shall work with the local BLM field office to develop a control strategy. The plan shall include a post-construction monitoring element that incorporates adaptive management protocols.	S
32	Pesticide use	If pesticides are used on the site, an integrated pest management plan shall be developed to ensure that applications will be conducted within the framework of BLM and DOI policies and entail only the use of EPA-registered pesticides. Pesticide use shall be limited to nonpersistent, immobile pesticides and shall only be applied in accordance with label and application permit directions and stipulations for terrestrial and aquatic applications. Any applications of herbicides will be subject to BLM herbicide treatment standard operating procedures. Only herbicides on the list of approved herbicide formulations (updated annually) will be used on public lands.	S, C, O, D
33	Fire	A Fire Management and Protection Plan shall be developed to implement measures to minimize the potential for a human-caused fire to affect ecological resources and respond to natural fire situations.	S

Table B-1 *(continued)*
Design Features

No.	Topic	Description of Measure	Phase
34	Waste	A Trash Abatement Plan shall be developed that focuses on containing trash and food in self-closing, sealable containers with lids that latch and empty them daily to reduce their attractiveness to opportunistic species, such as common ravens, coyotes, and feral dogs that could serve as predators on native wildlife and special status animals. Remove trash containers associated with construction from the project site when construction is complete.	S
35	Reclamation	A Decommissioning and Site Reclamation Plan specific to the project shall be developed and implemented. Baseline data shall be collected in each project area as a benchmark for measuring the success of reclamation efforts. The plan shall contain an adaptive management component that allows for the incorporation of lessons learned from monitoring data. The plan shall require that land surfaces be returned to pre-development contours to the greatest extent feasible immediately following decommissioning. The plan shall focus on the establishment of native plant communities similar to those present in the vicinity of the project site. The plan shall be designed to expedite the re-establishment of vegetation and require restoration to be completed as soon as practicable. To ensure rapid and successful re-establishment efforts, the plan shall specify site-specific measurable success criteria, including target dates, which shall be developed in coordination with the BLM and which shall be required to be met by the operator. Vegetation re-establishment efforts shall continue until all success criteria have been met. Bonding to cover the full cost of vegetation re-establishment shall be required. Species used for vegetation re-establishment shall consist of native species dominant within the plant communities existing in adjacent areas having similar soil conditions. The plan shall require the use of weed-free seed mixes of native shrubs, grasses, and forbs of local sources where available. When available, seed of known origin as labeled by state seed certification programs shall be used. Local native genotypes shall be used. If cultivars of native species are used, certified seed (i.e., blue tag) shall be used. "Source identified" seed (i.e., yellow tag) shall be used when native seed is collected from wildland sites. The cover, species composition, and diversity of the re-established plant community shall be similar to those in the vicinity of the site. In areas where suitable native species are unavailable, other plant species approved by the BLM could be used. If non-natives are necessary they shall be non-invasive, non-competitive, and ideally are short-lived, have low reproductive capabilities, or be self-pollinating to prevent gene flow into the native community. Non-natives used shall not exchange genetic material with common native plant species. The plan shall also include site-specific, measurable success criteria that must be met. The plan shall be developed in coordination with appropriate federal and state agencies.	S, D
36	Reclamation	Post-decommissioning protocols shall include monitoring for native vegetation recovery; invasive species colonization and spread; wildlife use; and special status species use. Monitoring data shall be used to determine the success of reclamation activities and the need for changes in ongoing management or for additional reclamation measures. Ongoing visual inspections for a minimum of 5 years following decommissioning activities shall be required to ensure adequate restoration and minimal environmental degradation. This period shall be extended until satisfactory results are obtained.	D

Table B-1 *(continued)*
Design Features

No.	Topic	Description of Measure	Phase
37	Mitigation/ monitoring	Prepare a project specific mitigation and monitoring plan in cooperation with and that meets the approval of permitting agencies and AGFD where applicable. Carry out the plan during all phases of the project to avoid, minimize, or mitigate adverse direct, indirect, and cumulative impacts, including habitat, special status plant, and wildlife species losses. Address at a minimum: • Biological resource mitigation, monitoring, and compliance measures required by federal, state, and local applicable permitting agencies. • Documentation (based on surveys) of sensitive plant and wildlife expected to be affected by all phases of the project (project construction, operation, abandonment, and decommissioning). Agencies may request additional surveying, based on the documentation or past experience working with the resources. Include measures to avoid or minimize impacts to species and habitat. • A detailed description of measures, including revegetation, soil stabilization, and erosion reduction measures, to minimize or mitigate permanent and temporary disturbances on vegetation, wildlife, and special status plants and animals from construction activities. The plan shall require that restoration occur as soon as possible after completion of activities to reduce the amount of habitat converted at any one time and to hasten the recovery to natural habitats. • Mitigation and monitoring unavoidable impacts on waters of the US, including wetlands. • Demonstration of compliance of the project with the regulatory requirements of the Bald and Golden Eagle Protection Act. The plan shall be developed in coordination with and permitted by the USFWS. • Measures to protect birds (including migratory species protected under the Migratory Bird Treaty Act) developed in coordination with and permitted by the appropriate federal and state agencies (e.g. BLM, USFWS, and state resource management agencies). • Measures to mitigate and monitor impacts on special status species developed in coordination with and permitted by the appropriate federal and state agencies (e.g. BLM, USFWS, and state resource management agencies). • Monitoring the potential for increase in predation of special status species (especially desert tortoise) from ravens and other species that are attracted to developed areas and opportunistically use tall structures to spot vulnerable prey. • Clearing and translocation of special status species, including the steps to implement the translocation as well as the follow-up monitoring of populations in the receptor locations, as determined in coordination with the appropriate federal and state agencies. The need for a Special Status Species Clearance and Translocation Plan shall be determined on a project-specific basis.	S

Table B-1 *(continued)*
Design Features

No.	Topic	Description of Measure	Phase
		• All locations on a map, at an approved scale, of sensitive plant and wildlife areas subject to disturbance and areas requiring temporary protection and avoidance during construction. • Aerial photographs or images, at an approved scale, of areas to be disturbed during project construction activities. • Duration for each type of monitoring and a description of monitoring methodologies and frequency. • Performance standards, thresholds, monitoring, and criteria to be used to determine if/when proposed mitigation is or is not successful. • All standards and remedial measures to be implemented if performance standards and criteria are not met. • Adaptive management strategies. • A closure/decommissioning or abandonment plan, including a description of funding mechanism(s).	
38	Monitoring	Designate a qualified biologist (approved by the BLM) responsible for overseeing compliance with biological resources BMPs and project-specific mitigation measures during mobilization, ground disturbance, grading, construction, operation, and closure/decommissioning, or project abandonment, particularly in areas containing or known to have contained sensitive biological resources, such as special status species and unique plant assemblages. Additional qualified biological monitors may be required on-site during all project phases as determined by the authorizing federal agency. It is suggested that the qualified biologist be responsible for actions including, but not limited to, the following: • Clearly marking sensitive biological resource areas and inspecting the areas at appropriate intervals for meeting regulatory terms and conditions. • Inspecting, daily, active construction areas where wildlife may have become trapped (for example, trenches, bores, and other excavation sites that constitute wildlife pitfalls outside the permanently fenced area) before beginning construction. At the end of the day, conducting wildlife inspections of installed structures that would entrap or not allow escape during periods of construction inactivity. Periodically inspecting areas with high vehicle activity (such as parking lots) for wildlife in harm's way. • Overseeing cactus, agave, and yucca salvage operations. • Immediately recording and reporting hazardous spills immediately as directed in the project hazardous materials management plan. • Coordinating directly and regularly with permitting agency representatives regarding biological resources issues, including biological resource BMP implementation. • Maintaining written records regarding implementation of biological resource BMPs and providing a summary of these records periodically in a report to the appropriate agencies.	C, O, D

Table B-1 *(continued)*
Design Features

No.	Topic	Description of Measure	Phase
		• Notifying the project owner and appropriate agencies of non-compliance with biological resources BMPs.	
Hazardous Materials			
39	Phase I surveys	For projects proposed on previously disturbed or developed lands, conduct a Phase I site assessment (American Society for Testing and Materials Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process (ASTM E1527) or other equivalent assessment method deemed acceptable by the appropriate regulatory oversight agency) for the project site and linear appurtenances. If Phase I identifies environmental conditions, concerns, or data gaps requiring additional site assessment to adequately characterize the site, conduct additional site assessment work (such as Phase 2) with appropriate regulatory agency oversight. Provide the Phase I, and if conducted, the Phase 2 site assessment with applications to appropriate lead agencies.	S
40	Hazardous materials/ waste plan	A Construction and Operation Waste Management Plan shall identify the waste streams that are expected to be generated at the site and addresses hazardous waste determination procedures, waste storage locations, waste-specific management and disposal requirements, inspection procedures, and waste minimization procedures. The plan shall address all solid and liquid wastes that may be generated at the site in compliance with the CWA requirements to obtain the project's NPDES permit.	S, C, O, D
41	Hazardous materials	All hazardous materials and vehicle/equipment fuels shall be transported, stored, managed, and disposed in accordance with accepted BMPs and in compliance with all applicable regulations and the requirements of approved plans, including, where applicable, a Stormwater Management Plan, a Spill Prevention and Emergency Response Plan, and a Hazardous Materials and Waste Management Plan.	C, O, D
42	Hazardous materials	Systems containing hazardous materials shall be designed and operated in a manner that limits the potential for hazardous materials release, constructed of compatible materials, and in good condition (as verified by periodic inspections), including provision of secondary containment features (to the extent practical); installation of sensors or other devices to monitor system integrity; installation of strategically placed valves to isolate damaged portions and limit the amount of hazardous materials in jeopardy of release; and robust inspection and repair procedures.	S, C, O, D
43	Hazardous materials storage	Secondary containment shall be provided for all onsite hazardous materials and waste storage, including fuel. In particular, fuel storage (for construction vehicles and equipment) shall be a temporary activity occurring only for as long as is needed to support construction activities.	C, O, D
44	Herbicide/ pesticide use	An Animal, Pest, and Vegetation Control Plan shall be developed to ensure that applications are conducted within the framework of BLM and DOI policies and standard operating procedures and entail only the use of EPA-registered pesticides/herbicides that also comply with state and local regulations.	C, O, D

Table B-1 *(continued)*
Design Features

No.	Topic	Description of Measure	Phase
45	Herbicide/ pesticide use	Use appropriate herbicide-free/pesticide-free buffer zones for herbicides not labeled for aquatic use, based on permitting agency or BLM/U.S. Forest Service risk assessment guidance. The federal guidance suggests minimum widths of 100 feet for aerial applications, 25 feet for applications dispersed by vehicle and 10 feet for hand spray applications.	C, O, D
46	Fire	A Fire Management and Protection Plan shall be developed to implement measures to minimize the potential for fires associated with substances used and stored at the site. The flammability of the specific heat transfer fluid (HTF) used at the facility shall be considered.	S, C, O, D
47	Spills	A comprehensive Spill Prevention and Emergency Response Plan shall be developed for the facility that meets the following criteria: is written, periodically updated, and made available to the entire workforce; contains procedures for timely notification of appropriate authorities, including the designated BLM land manager; provides spill/emergency contingency planning for each type of hazardous material present, including abatement or stabilizing of release, recovery of spilled product, and remediation of impacted environmental media; is supported by the strategic deployment of appropriate spill response materials and equipment, including PPE for individuals with spill or emergency response assignments; provides for prompt response to spills and timely delivery of recovered spill materials and contaminated environmental media to appropriately permitted off-site treatment or disposal facilities; formally assigns spill and emergency response duties to specified individuals; provides and documents appropriate training to individuals with spill or emergency response assignments; provides for the prompt response to spills and timely delivery of recovered spill materials and contaminated environmental media to appropriately permitted off-site treatment or disposal facilities; provides general awareness training to remaining facility personnel; and provides for written documentation of each event, including root cause analysis, corrective actions taken, and a characterization of the resulting environmental or health and safety impacts.	S, C, O, D
48	Contaminated soils	If any newly found potentially contaminated soils are discovered, contractors would stop work immediately in that area and notify the project proponent, BLM, and Arizona Department Environmental Quality of the discovery and coordinate for any excavation and disposal of the soil.	C, O, D
Health and Safety			
49	Health and safety	A health and safety program shall be developed to protect workers during site characterization, construction, operation, and decommissioning of a renewable energy project. The program shall identify all applicable federal and state occupational safety standards and establish safe work practices addressing all hazards, including requirements for developing the following plans: general injury prevention; personal protective equipment (PPE) requirements and training; respiratory protection; hearing conservation; electrical safety; hazardous materials safety and communication; housekeeping and material handling; confined space entry; hand and portable power tool use; gas-filled equipment use; and rescue response and emergency medical support, including on-site first-aid capability.	S

Table B-1 *(continued)*
Design Features

No.	Topic	Description of Measure	Phase
50	Health	If operation of the solar and/or wind facility and associated transmission lines and substations is expected to cause potential adverse impacts on nearby residences and occupied buildings from noise, sun reflection, flicker, or electromagnetic fields, recommendations for addressing these concerns shall be incorporated into the project design (e.g., establishing a sufficient setback from transmission lines).	O
51	Safety	The health and safety program shall address OSHA standard practices for the safe use of explosives and blasting agents (e.g., if used to construct foundations for power tower facilities); measures for reducing occupational EMF exposures; the establishment of fire safety evacuation procedures; and required safety performance standards (e.g., electrical system standards and lighting protection standards). The program shall include training requirements for applicable tasks for workers and establish procedures for providing required training to all workers. Documentation of training and a mechanism for reporting serious accidents to appropriate agencies shall be established.	S, C, O, D
52	EMI	Design the project to reduce electromagnetic interference (EMI) (for example, impacts to radar, microwave, television, and radio transmissions) and comply with Federal Communications Commission (FCC) regulations. Conduct signal strength studies when proposed locations have the potential to affect FCC licensed transmissions. Reduce to nil potential or real interference with public safety communication systems (for example, radio traffic related to emergency activities) or the amateur radio bands.	S
53	EMI	In the event an installed wind energy development project results in electromagnetic interference (EMI), the operator shall work with the owner of the impacted communications system to resolve the problem. Additional warning information may also need to be conveyed to aircraft with onboard radar systems so that echoes from wind turbines can be quickly recognized.	O
54	Traffic	A Traffic Management Plan shall be prepared for the site access roads to control hazards that could result from increased truck traffic (most likely during construction or decommissioning), to ensure that traffic flow would not be adversely affected and that specific issues of concern (e.g., the locations of school bus routes and stops) are identified and addressed. This plan shall incorporate measures such as informational signs, flaggers when equipment may result in blocked throughways, and traffic cones to identify any necessary changes in temporary lane configuration. The plan shall be developed in coordination with local planning authorities.	S, C, O, D
55	Meteorological towers	Meteorological towers installed for site monitoring and testing shall be inspected periodically (at least every 6 months) for structural integrity.	S
56	Glare	For parabolic trough facilities, an evaluation of the potential exposure of the public to glare from parabolic trough mirrors shall be conducted. If there is a potential for exposure at levels that could cause retinal damage, measures to eliminate the exposure shall be implemented (e.g., slatted fencing to shield views from outside the facility).	S
57	Glare	A Heliostat Positioning Plan shall be prepared for power tower projects to avoid exposures to reflected sunlight that could cause retinal damage, temporary blindness, or distraction to operators of aircraft or motorized	S

Table B-1 *(continued)*
Design Features

No.	Topic	Description of Measure	Phase
		vehicles on roads in the vicinity of facilities.	
58	Glare	Parabolic trough and power tower facilities shall develop a Glare Monitoring Plan to log, investigate, and respond to complaints about glare, either from heliostats or from the tower receivers.	S, O
59	Glare	For power tower facilities, the hazards associated with the tower and the glare from the heliostat mirrors shall be evaluated through coordination with local airports and evaluation of flight paths.	S, O
60	SF6	Because of the high global warming potential of SF6, the use of alternative dielectric fluids shall be considered. Alternatively, regular leak detection inspections shall be required to minimize the occurrence and impacts of SF6 leaks from facility piping.	S
61	Fire	Operators shall develop a Fire Management and Protection Plan to implement measures to minimize the potential for a human-caused fire and to respond to human-caused or natural-caused fires. Carry out the plan during all phases of project development. Train site workers to respond, as appropriate, to fires. Maintain a 30-foot firebreak within the fenced area containing project facilities.	S
Lands and Realty			
62	Interconnections	In applications to appropriate lead agencies, provide a copy of the electric transmission interconnection study from the appropriate control agency. Include in the interconnection study an identification of the transmission impacts beyond the first point of interconnection and acceptable measures to mitigate/alleviate impacts to the transmission network system. When more than one alternative mitigation measure is identified, indicate in the applications the measure selected by the project developer. Provide for each selected mitigation measure, an environmental analysis sufficient to meet the CEQA requirements for indirect project impacts.	S
63	Decommissioning	Inoperative turbines shall be repaired, replaced, or removed in a timely manner. Requirements to do so shall be incorporated into the due diligence provisions of the rights-of-way authorization. Operators will be required to demonstrate due diligence in the repair, replacement, or removal of turbines; failure to do so may result in termination of the right-of-way authorization.	D
Native American Concerns			
64	Burial sites	Tribal burial sites shall be avoided. If avoidance is not possible, consultation with the lineal descendants or Tribal affiliates of the deceased shall be undertaken before removing a known burial. Remains and objects s shall be protected and their treatment and disposition determined according to NAGPRA statutory procedures and regulations. A contingency plan for encountering unanticipated burials and funerary goods during construction, maintenance, or operation of a renewable energy facility shall be developed as part of a formalized agreement to address management and mitigation options for significant cultural resources (see Cultural Resources) in consultation with the appropriate Tribal governments and cultural authorities well in advance of any ground disturbances.	S
65	Archaeology	Archaeological sites created by ancestral Native American populations shall be avoided whenever possible. However, when archaeological excavations are necessary, affiliated Tribe(s) shall be consulted in developing	S, C, O,

Table B-1 *(continued)*
Design Features

No.	Topic	Description of Measure	Phase
		research designs and data recovery plans. Possible mitigations include scientific excavation; monitoring or participation in excavations by Tribal representatives; or approved curation of collections in tribal facilities that meet government standards to ensure appropriate preservation and management.	D
Noise - Vibration			
66	Equipment	Adhere to applicable wind turbine national or international acoustic design standards (for example, International Energy Agency, International Electrotechnical Commission, and the American National Standards Institute).	S
67	Monitoring/ mitigation	Prepare a noise monitoring and mitigation plan. Design the project to: minimize noise impacts to sensitive noise receptors, limit increases to less than a five to 10 dBA increase above ambient levels, and not exceed local noise standards. Address project generated noise impacts as much as possible. Consider acquiring lands to serve as buffers around the proposed facilities.	S
Paleontology			
68	Mitigation	The Paleontological Resources Management Plan shall include a mitigation plan; mitigation may include avoidance, removal of fossils (data recovery), stabilization, monitoring, protective barriers and signs, or other physical or administrative protection measures. The Paleontological Resources Management Plan also shall identify measures to prevent potential looting, vandalism, or erosion impacts and address the education of workers and the public to make them aware of the consequences of unauthorized collection of fossils on public land.	S
Soils			
69	Geotechnical	Ground-disturbing geotechnical studies (e.g., geotechnical drilling) shall adhere to the permitting requirements specified by the BLM in 43 CFR 2920.	S, C
70	Disturbance area	Existing roads, disturbed areas, and borrow pits shall be used. If new roads are necessary, they shall be designed and constructed to the appropriate road design standards, such as those described in BLM Manual 9113. The specifications and codes developed by the US Department of Transportation (DOT) are also to be taken into account.	S, C, O, D
71	Roads	New roads shall be designed to follow natural land contours and avoid or minimize hill cuts in the project area and avoid existing desert washes. Siting of new roads and walking trails (if any) is to be consistent with the designation criteria specified by the BLM in 43 CFR 8342.1.	S
72	Roads	Temporary roads shall be designed with eventual reclamation in mind.	S
Transportation			
73	Easements/ encroachments	Obtain encroachment permits from appropriate agencies.	C, O, D
74	Transportation plans	An access road siting and management plan shall be prepared incorporating existing BLM standards regarding road design, construction, and maintenance such as those described in the BLM 9113 Manual and the Surface	S

Table B-1 *(continued)*
Design Features

No.	Topic	Description of Measure	Phase
		Operating Standards and Guidelines for Oil and Gas Exploration and Development (revised 2007).	
75	Transportation plans	A transportation plan shall be developed, particularly for the transport of turbine components, main assembly cranes, and other large pieces of equipment. The plan shall consider specific object sizes, weights, origin, destination, and unique handling requirements and shall evaluate alternative transportation approaches. In addition, the process to be used to comply with unique state requirements and to obtain all necessary permits shall be clearly identified.	S
76	Design	Existing roads shall be used, but only if in safe and environmentally sound locations. If new roads are necessary, they shall be designed and constructed to the appropriate BLM road design standards and be no higher than necessary to accommodate their intended functions (e.g., traffic volume and weight of vehicles). Excessive grades on roads, road embankments, ditches, and drainages shall be avoided, especially in areas with erodible soils. Special construction techniques shall be used, where applicable. Abandoned roads and roads that are no longer needed shall be recontoured and revegetated.	S, C, O, D
Visual Resources			
77	VRM	Facilities proposed within the foreground/middleground distance zone (0 to 5 mi [0 to 8 km]) of National Scenic Highways and All-American Roads shall include measures to minimize the profile of all structures related to the facility so that the viewshed from the scenic highway meets VRM objectives. The project developer shall evaluate the potential visual impacts on National Scenic Highways and All-American Roads associated with the proposed project and identify appropriate mitigation measures for inclusion as stipulations in the Plan of Development.	S
78	Design	Project developers shall exhaust opportunities of projects to be sited outside the viewsheds of KOPs, or if facilities must be sited within view of KOPs then they shall be sited as far away as possible, since visual impacts generally diminish as viewing distance increases.	S
79	Special areas	Specific to national historic trails (NHTs), but possibly pertaining to other special designations, National Parks (NPs) and National Wildlife Refuges (NWRs): • For applications that include remnants of a National Historic Trail, are located within the viewshed of a National Historic Trail's designated centerline, or include or are within the viewshed of a trail eligible for listing in the NRHP by virtue of its integrity of setting and feeling, the applicant shall evaluate the potential visual impacts on the trail, minimize, avoid, or mitigate adverse effects, and identify appropriate mitigation measures as stipulations in the Plan of Development (see also Cultural Resources). • Because the landscape setting observed from national historic sites, national trails, and Tribal cultural resources may be a part of the historic context contributing to the historic significance of the site or trail, project siting project siting will strive to avoid locating facilities that would alter the visual setting such that they would reduce the historic significance or function.	S, C, O, D

Table B-1 *(continued)*
Design Features

No.	Topic	Description of Measure	Phase
80	Lighting	A Lighting Plan shall be prepared that documents how lighting will be designed and installed to minimize night-sky impacts during facility construction and operations phases. Lighting for facilities shall not exceed the minimum number of lights and brightness required for safety and security and shall not cause excessive reflected glare. Full cut-off luminaires shall be utilized to minimize uplighting. Lights shall be directed downward or toward the area to be illuminated. Light fixtures shall not spill light beyond the project boundary. Lights in high-illumination areas not occupied on a continuous basis shall have switches, timer switches, or motion detectors so that the lights operate only when the area is occupied. Where feasible, vehicle-mounted lights shall be used for night maintenance activities. Wherever feasible, consistent with safety and security, lighting shall be kept off when not in use. The Lighting Plan shall include a process for promptly addressing and mitigating complaints about potential lighting impacts.	S, C, O
81	Glare	A study to assess accurately and to quantify potential glinting and glare effects and to determine potential health, safety, and visual impacts associated with glinting and glare effects shall be conducted by qualified individuals using appropriate and commonly accepted software and procedures. The study results must be made available to the BLM in advance of project approval. If the project design is changed during the siting and design process such that substantial changes to glinting and glare effects may occur, glinting and glare effects shall be recalculated, and the study results made available to the BLM.	S
82	Glare	Commercial symbols or signs and associated lighting on buildings or other structures shall be prohibited.	S, C, O
Water Resources			
83	Groundwater	Project developers who plan to use groundwater shall develop and implement a groundwater Water Resources Monitoring and Mitigation Plan, which includes monitoring the effects of groundwater withdrawal for project uses, vegetation restoration and dust control uses during decommissioning and aquifer recovery after project decommissioning. Monitoring frequency shall be decided on a site-specific basis and in coordination with federal, state, and local agencies managing groundwater resources of the region.	S, C, O, D
84	Groundwater	If groundwater use is proposed, project developers shall ensure that a comprehensive analysis of the groundwater basin is provided and that the following potential significant impacts are evaluated: • Creation or exacerbation of overdraft conditions and their potential to cause subsidence and loss of aquifer storage capacity; • Use that cause injury to other water rights claims in the basin; • Estimates of the total cone of depression considering cumulative drawdown from all potential pumping in the basin, including the project, for the life of the project through the decommissioning phase; • Changes in water quality that affect other beneficial use; and • Effects on groundwater dependent ecosystems such as springs, seeps, and wetlands that provide water for plants and animals.	S

Table B-1 *(continued)*
Design Features

No.	Topic	Description of Measure	Phase
85	Groundwater	Groundwater wells constructed during any stage of the project would conform to state and local standards and records shall include: • Legal description (township, range, section, and quarter section);Project map with proposed and existing well locations; • Well design characteristics: casing diameter, screened interval(s), well depth, and static water level; • Results of groundwater pumping tests or other tests done in the well; and • Anticipated pumping capacity and peak pumping rates. For groundwater wells located outside of an AMA or for industrial users within an AMA, the following are not required by ADWR, but are sitting requirements for the BLM: • Identification of the groundwater aquifer and its hydrogeologic characteristics; • Estimation of the potential cone of depression that might be produced by the proposed pumping throughout the lifetime of a project by using an analytical or numerical model; and • Estimate of the total cone of depression considering cumulative drawdown from all potential pumping in the basin, including the project, for the life of the project through the decommissioning phase (also using an analytical or numerical model).	S
86	Surface water	Project developers who plan to use surface water sources shall develop a Water Resources Monitoring and Mitigation Plan that includes monitoring changes in flows, volumes, and water quality during construction and operations, as well as their recovery during decommissioning. Monitoring frequency shall be decided on a site-specific basis and in coordination with federal, state, and local agencies managing surface water resources of the region.	S
87	Water quality	No project and/or project related activities shall degrade, negatively effect, and/or contribute to impairment of existing surface water quality conditions for waterbodies that are Federally designated on the CWA section 303(d) list of impaired surface waters and existing water quality shall be maintained and protected in a surface water that is classified as an Outstanding Arizona Water (OAW) under Arizona Administrative Code R18-11-112 or designated Arizona's Outstanding Natural Resource Waters.	C, O, D
88	Water quality	When an herbicide/pesticide is used to control vegetation, the climate, soil type, slope, and vegetation type shall be considered in determining the risk of herbicide/pesticide contamination. Additionally, an Animal, Pest, and Vegetation Control Plan shall be developed to ensure that applications are conducted within the framework of BLM and DOI policies and standard operating procedures and entail only the use of EPA-registered pesticides/herbicides that also comply with state and local regulations.	C, O, D

Table B-1 *(continued)*
Design Features

No.	Topic	Description of Measure	Phase
89	Flooding	Projects developers shall maintain the pre-development flood hydrograph for all storms up to and including the 100-yr rainfall event. All stormwater retention and/or infiltration and treatment systems shall also be designed for all storms up to and including the 100-yr storm event. As part of a Spill Prevention and Emergency Response Plan, measures to prevent potential groundwater and surface water contamination shall be identified.	S, C, O, D
90	Hydrology	Developers shall be required to conduct a detailed hydrologic study demonstrating a clear understanding of the local surface water and groundwater hydrology. At a minimum this hydrologic study shall include: • Quantification of physical characteristics describing surface water features, such as streamflow rates, stream cross-sections, channel routings, seasonal flow rates (intermittent streams), peak flow rates (ephemeral washes/drainages), sediment characteristics and transport rates, lake depths, and surface areas of lakes, wetlands, and floodplains; • Hydrologic analysis and modeling to define the 100-yr, 24-hour rainfall event for the project area and calculation of projected runoff from this storm at site; • Hydrologic analysis and modeling to identify 100-yr floodplain boundaries of any surface water feature on the site; • Quantification of physical characteristics describing the groundwater aquifer, such as physical dimensions of the aquifer, sediment characteristics, confined/unconfined conditions, hydraulic conductivity and transmissivity distribution of the aquifer, groundwater surface elevations, and groundwater flow processes (direction, recharge/discharge, current basin extractions, and surface water-groundwater connectivity); • Quantification of regional climate including seasonal and long-term information on temperatures, precipitation, evaporation, and evapotranspiration; and • Quantification of the sustainable yield of surface waters and groundwater available to the project. Project developers shall evaluate the water sources in terms of existing water rights and management plans for adequacy to serve project demands while maintaining aquatic, riparian, and other water-dependent resources.	S
91	Wastewater	Developers shall coordinate with state/local regulatory agencies regarding the issuance of permits or "will-serve" agreements for development and use of water, and/or the operation of on-site wastewater treatment systems.	S, O
92	Stormwater	The facility shall obtain and comply with a construction stormwater permit through the EPA or state-run NPDES program (whichever applies within the state). Additionally, the EPA requires any development larger than 20 acres (0/08 km2) begun after August 2011 to comply with a requirement to monitor construction discharges for turbidity concentrations.	S, C, O, D

Table B-1 *(continued)*
Design Features

No.	Topic	Description of Measure	Phase
93	Mitigation	The Project Proponent will compensate for the loss of ephemeral drainage habitat through in-kind habitat restoration of a portion of the main drainage at a minimum ratio of 2:1. Restoration components may include removal of accumulated sediment, bank stabilization, planting of vegetation, sediment control measures, establishing protective habitat buffers, placing a conservation easement over the restored drainage and buffer, and funding an endowment that will provide for long-term management.	C
94	Mitigation	A Drainage, Erosion, and Sedimentation Control Plan shall be developed that ensures protection of water quality and soil resources, demonstrates no increase in off-site flooding potential, and includes provisions for stormwater and sediment retention on the project site. The plan would identify site surface water runoff patterns and develop mitigation measures that prevent excessive and unnatural soil deposition and erosion throughout and downslope of the project site and project-related construction areas. The plan would achieve the following: • Runoff from parking lots, roofs, or other impervious surfaces would be directed to the immediate landscape or to retention basins prior to being released downgradient of the site. • Any landscaping used for stormwater treatment shall not be an invasive species and preferably a native species and would require little or no irrigation and would be recessed to create retention basins/areas used to capture runoff. • The amount of area covered by impervious surfaces would be reduced through the use of permeable pavement or other pervious surfaces. • Natural drainages and a pre-project hydrograph would be maintained for the area. Siting in identified 100-yr floodplains shall not be allowed within the development.	S, C, D
Wildfire			
95	Noxious weeds	A vegetation plan designed to prevent the establishment of non-native, invasive species on the solar energy facility and along transmission line ROWs and roads shall be developed and implemented to minimize the potential for increasing wildland fire frequency.	S, C, O, D

Table B-2
Required Plans

Construction, Operation, and Maintenance Plan	Applicants are required to prepare a Construction, Operations, and Maintenance (COM) Plan that incorporates the stipulations and conditions of each agency. The COM Plan will provide information on the project's design, construction, operation and maintenance, and environmental mitigation measures that will be used and implemented by construction contractors and personnel.
Access Road Siting and Management Plan	An access road siting and management plan shall be prepared incorporating existing BLM standards regarding road design, construction, and maintenance such as those described in the BLM 9113 Manual and the Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development (revised 2007).
Compensatory Wetland Mitigation & Monitoring Plan	Compensatory Wetland Mitigation and Monitoring Plan (CWMMP) describes the mitigation of potential impacts to wetlands that would result from a proposed project. The proposed mitigation measures set forth in this Plan are intended to compensate for project impacts. The proposed compensatory mitigation measures described in this Plan address the direct, indirect, and cumulative impacts associated with a proposed project. The overall objective of the CWMMP is to ensure that there will be no net loss of wetland function or area.
Decommissioning & Site Reclamation Plan (Solar & IM 2009-043)	Prior to the termination of the right-of-way authorization, a decommissioning plan shall be developed and approved by the BLM. The decommissioning plan shall include a site reclamation plan and monitoring program. A Decommissioning and Site Reclamation Plan specific to the project shall be developed and implemented. Baseline data shall be collected in each project area as a benchmark for measuring the success of reclamation efforts. The plan shall contain an adaptive management component that allows for the incorporation of lessons learned from monitoring data. The plan shall require that land surfaces be returned to pre-development contours to the greatest extent feasible immediately following decommissioning. The plan shall focus on the establishment of native plant communities similar to those present in the vicinity of the project site. The plan shall be designed to expedite the re-establishment of vegetation and require restoration to be completed as soon as practicable. To ensure rapid and successful re-establishment efforts, the plan shall specify site-specific measurable success criteria, including target dates, which shall be developed in coordination with the BLM and which shall be required to be met by the operator. Vegetation re-establishment efforts shall continue until all success criteria have been met. Bonding to cover the full cost of vegetation re-establishment shall be required. Species used for vegetation re-establishment shall consist of native species dominant within the plant communities existing in adjacent areas having similar soil conditions. The plan shall require the use of weed-free seed mixes of native shrubs, grasses, and forbs of local sources where available. When available, seed of known origin as labeled by state seed certification programs shall be used. Local native genotypes shall be used. If cultivars of native species are used, certified seed (i.e., blue tag) shall be used. "Source identified" seed (i.e., yellow tag) shall be used when native seed is collected from wildland sites. The cover, species composition, and diversity of the re-established plant community shall be similar to those in the vicinity of the site. In areas where suitable native species are unavailable, other plant species approved by the BLM could be used. If non-natives are necessary they shall be non-invasive, non-competitive, and ideally are short-lived, have low reproductive capabilities, or be self-pollinating to prevent gene flow into the native community. Non-natives used shall not exchange genetic material with common native plant species. The plan shall also include site-specific, measurable success criteria that must be met. The plan shall be developed in coordination with appropriate federal and state agencies.

Table B-2 *(continued)*
Required Plans

	The plan shall require that all above ground and near-ground structures be removed. Some structures shall be removed only to a level below the ground surface that will allow reclamation/restoration. Topsoil from all decommissioning activities shall be salvaged and reapplied during final reclamation. The plan shall include provisions for monitoring and determining compliance with the project's visual mitigation and reclamation objectives. Reclamation of the construction site shall begin immediately after construction to reduce the likelihood of visual contrasts associated with erosion and invasive weed infestation and to reduce the visibility of affected areas as quickly as possible.
Drainage, Erosion & Sedimentation Control Plan	A Drainage, Erosion, and Sedimentation Control Plan shall be developed that ensures protection of water quality and soil resources, demonstrates no increase in off-site flooding potential, and includes provisions for stormwater and sediment retention on the project site. The plan would identify site surface water runoff patterns and develop mitigation measures that prevent excessive and unnatural soil deposition and erosion throughout and downslope of the project site and project-related construction areas. The plan would achieve the following: • Runoff from parking lots, roofs, or other impervious surfaces would be directed to the immediate landscape or to retention basins prior to being released downgradient of the site • Any landscaping used for stormwater treatment would require little or no irrigation and would be recessed to create retention basins/areas used to capture runoff • The amount of area covered by impervious surfaces would be reduced through the use of permeable pavement or other pervious surfaces • Natural drainages and a pre-project hydrograph would be maintained for the area
Dust Abatement Plan	Plants, wildlife, and their habitats shall be protected from fugitive dust through measures included in the facility's Dust Abatement Plan.
Ecological Resources Mitigation & Monitoring Plan	A vegetation plan designed to prevent the establishment of non-native, invasive species on the solar energy facility and along transmission line ROWs and roads shall be developed and implemented to minimize the potential for increasing wildland fire frequency An Ecological Resources Mitigation and Monitoring Plan shall be developed to avoid, minimize, or mitigate adverse impacts on important ecological resources. The plan shall include but not necessarily be limited to the following elements: • Revegetation, soil stabilization, and erosion reduction measures that shall be implemented to ensure that all temporary use areas are restored. The plan shall require that restoration occur as soon as possible after completion of activities to reduce the amount of habitat converted at any one time and to speed up the recovery to natural habitats. • Mitigation and monitoring unavoidable impacts on waters of the United States, including wetlands. • Compensatory mitigation and monitoring for significant direct, indirect, and cumulative impacts on and loss of habitat for special status plant and animal species. • Demonstration of compliance of the project with the regulatory requirements of the Bald and Golden Eagle Protection Act. The plan shall be developed in coordination with and permitted by the USFWS. • Measures to protect birds (including migratory species protected under the

Table B-2 *(continued)*
Required Plans

Migratory Bird Treaty Act) developed in coordination with and permitted by the appropriate federal and state agencies (e.g., BLM, USFWS, and state resource management agencies).

- Measures to mitigate and monitor impacts on special status species developed in coordination with and permitted by the appropriate federal and state agencies (e.g., BLM, USFWS, and state resource management agencies)
- Monitoring the potential for increase in predation of special status species (especially desert tortoise) from ravens and other species that are attracted to developed areas and opportunistically use tall structures to spot vulnerable prey.
- Clearing and translocation of special status species, including the steps to implement the translocation as well as the follow-up monitoring of populations in the receptor locations, as determined in coordination with the appropriate federal and state agencies. The need for a Special Status Species Clearance and Translocation Plan shall be determined on a project-specific basis
- Prepare a project specific ecological mitigation and monitoring plan in cooperation with and that meets the approval of permitting agencies. Carry out the plan during all phases of the project and, in general, identify appropriate mitigation levels to compensate for significant direct, indirect, and cumulative impacts, including habitat, special status plant, and wildlife species losses. Address at a minimum:
  - Biological resource mitigation, monitoring, and compliance measures required by federal, state, and local applicable permitting agencies.
  - Documentation (based on surveys) of sensitive plant and wildlife expected to be affected by all phases of the project (project construction, operation, abandonment, and decommissioning). Agencies may request additional surveying, based on the documentation or past experience working with the resources. Include measures to avoid or minimize impacts to species and habitat.
  - A detailed description of measures to minimize or mitigate permanent and temporary disturbances from construction activities.
  - All locations on a map, at an approved scale, of sensitive plant and wildlife areas subject to disturbance and areas requiring temporary protection and avoidance during construction.
  - Aerial photographs or images, at an approved scale, of areas to be disturbed during project construction activities.
  - Duration for each type of monitoring and a description of monitoring methodologies and frequency.
  - Performance standards and criteria to be used to determine if/when proposed mitigation is or is not successful.
  - All standards and remedial measures to be implemented in a timeframe to be determined by BLM if performance standards and criteria are not met.
  - A closure/decommissioning or abandonment plan, including a description of funding mechanism(s).

Table B-2 *(continued)*
Required Plans

Fire Management & Protection Plan	A Fire Management and Protection Plan shall be developed to implement measures to minimize the potential for a human-caused fire to affect ecological resources and respond to natural fire situations. A Fire Management and Protection Plan shall be developed to implement measures to minimize the potential for fires associated with substances used and stored at the site. The flammability of the specific HTF used at the facility shall be considered. Operators shall develop a Fire Management and Protection Plan to implement measures to minimize the potential for a human-caused fire and to respond to human-caused or natural-caused fires. Carry out the plan during all phases of project development. Train site workers to respond, as appropriate, to fires. Maintain a 30-foot firebreak within the fenced area containing project facilities.
Glint & Glare Assessment, Mitigation & Monitoring Plan	A study to assess accurately and to quantify potential glinting and glare effects and to determine potential health, safety, and visual impacts associated with glinting and glare effects shall be conducted by qualified individuals using appropriate and commonly accepted software and procedures. The study results must be made available to the BLM in advance of project approval. If the project design is changed during the siting and design process such that substantial changes to glinting and glare effects may occur, glinting and glare effects shall be recalculated, and the study results made available to the BLM. Parabolic trough and power tower facilities shall develop a Glare Monitoring Plan to log, investigate, and respond to complaints about glare, either from heliostats or from the tower receivers.
Habitat Restoration & Management Plan (Solar & IM 2009-043)	A habitat restoration plan shall be developed to avoid, minimize, or mitigate negative impacts on vulnerable wildlife while maintaining or enhancing habitat values for other species. The plan shall identify reclamation, soil stabilization, and erosion reduction measures that shall be implemented to ensure that all temporary use areas are restored. The plan shall require that restoration occur as soon as possible after completion of activities to reduce the amount of habitat converted at any one time and to speed up the recovery to natural habitats.
Heliostat Positioning Plan	A Heliostat Positioning Plan shall be prepared for power tower projects to avoid exposures to reflected sunlight that could cause retinal damage, temporary blindness, or distraction to operators of aircraft or motorized vehicles on roads in the vicinity of facilities. The plan should also avoid use of "standby points" (i.e., focal points away from the receiver vessel when all mirrors are not needed and some are in standby mode), but rather keep reflected beams dispersed to avoid impacts to birds through incineration.
Historic Properties Treatment Plan	Retain a qualified cultural resources specialist to write and carry out a monitoring and mitigation plan or agreement, when applicable, and to be available if cultural resources are encountered during construction. Avoidance of known cultural resources is generally the preferred resolution option; include in the plan measures to protect avoided resources during construction and to prevent looting/vandalism and erosion. If project impacts to known NRHP-eligible cultural resources are unavoidable, data recovery may be requested; include a data recovery strategy in the plan. The project developer may also be asked by the appropriate lead agency to include additional measures for addressing the discovery of previously unknown cultural resources during construction. Consider the following measures, at a minimum: • Hire a qualified archaeological monitor to oversee project excavations. • Develop and use a cultural resources construction personnel training program to promote cultural resources identification and lawful and appropriate response to discoveries.

Table B-2 *(continued)*
Required Plans

	• Notify involved agencies of unexpected cultural or historical resources discoveries during construction. The project developer may be asked or ordered to cease construction in the vicinity of the discovery to allow evaluation and formulation of appropriate mitigation measures. • If human remains are discovered, cease construction and consult with the lead agencies. The agencies will likely follow particular state and federal laws that address the treatment of human remains. • Where unavoidable impacts from project construction are expected, recover data from newly discovered NRHP-eligible cultural resources. • Have the cultural resources specialist prepare a report documenting archaeological monitoring and data recovery activities. Project proponents should expect to provide input to lead agency-prepared mitigation plans, agreement documents and related historic properties treatment plans. Treatment plans will guide: • Completion of any supplemental surveys needed to address refinements in the final project design to ensure full coverage of areas that could be affected.. • Outstanding geoarchaeological investigations. • Evaluation of newly identified cultural resources for NRHP eligibility. • Assessment of project impacts to NRHP-eligible cultural resources. • Development of measures to address the effects of the project on such eligible resources to avoid or reduce impacts as much as possible. IM 2009-043 - Cultural Resources Management Plan If cultural resources are present at the site, or if areas with a high potential to contain cultural material have been identified, a cultural resources management plan (CRMP) shall be developed. This plan shall address mitigation activities to be taken for cultural resources found at the site. Avoidance of the area is always the preferred mitigation option. Other mitigation options include archaeological survey and excavation, and monitoring. If an area exhibits a high potential, but no artifacts were observed during an archaeological survey, monitoring by a qualified archaeologist may be required during all excavation and earthmoving in the high-potential area. A report shall be prepared documenting these activities. The CRMP also shall (1) establish a monitoring program, (2) identify measures to prevent potential looting/vandalism or erosion impacts, and (3) address the education of workers and the public to make them aware of the consequences of unauthorized collection of artifacts and destruction of property on public lands.
Integrated Vegetation Management Plan	An Integrated Vegetation Management Plan shall be developed that is consistent with applicable regulations and agency policies for the control of noxious weeds and invasive plant species. The plan shall address monitoring; ROW vegetation management; the use of certified weed-free seed and mulching; the cleaning of vehicles to avoid the introduction of invasive weeds; and the education of personnel on weed identification, the manner in which weeds spread, and the methods for treating infestations. For transmission line ROWs, the plan shall be consistent with the existing vegetation management plan for that ROW. Principles of integrated pest management, including biological controls, shall be used to prevent the spread of invasive species. The plan shall include periodic monitoring, reporting, and immediate eradication of noxious weed or invasive species occurring within all managed areas. A controlled inspection and cleaning area shall 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. To prevent the spread of invasive

Table B-2 *(continued)*
Required Plans

	species, project developers shall work with the local BLM field office to determine whether a pre-activity survey is warranted, and if so, conduct the survey. If invasive plant species are present, project developers shall work with the local BLM field office to develop a control strategy. The plan shall include a post-construction monitoring element that incorporates adaptive management protocols.
Lighting Plan	A Lighting Plan shall be prepared that documents how lighting will be designed and installed to minimize night-sky impacts during facility construction and operations phases. Lighting for facilities shall not exceed the minimum number of lights and brightness required for safety and security and shall not cause excessive reflected glare. Full cut-off luminaires shall be utilized to minimize uplighting. Lights shall be directed downward or toward the area to be illuminated. Light fixtures shall not spill light beyond the project boundary. Lights in high-illumination areas not occupied on a continuous basis shall have switches, timer switches, or motion detectors so that the lights operate only when the area is occupied. Where feasible, vehicle-mounted lights shall be used for night maintenance activities. Wherever feasible, consistent with safety and security, lighting shall be kept off when not in use. The Lighting Plan shall include a process for promptly addressing and mitigating complaints about potential lighting impacts.
Noxious Weeds & Invasive Species Plan (IM 2009-043 & SPEIS)	Operators shall develop a plan for control of noxious weeds and invasive species, which could occur as a result of new surface disturbance activities at the site. The plan shall address monitoring, education of personnel on weed identification, the manner in which weeds spread, and methods for treating infestations. The use of certified weed-free mulch and certified weed-free seed shall be required. If trucks and construction equipment are arriving from locations with known invasive vegetation problems, a controlled inspection and cleaning area shall 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.
Nuisance Animal & Pest Control Plan (IM 2009-043 - Integrated Pest Management Plan)	An Animal, Pest, and Vegetation Control Plan shall be developed to ensure that applications are conducted within the framework of BLM and DOI policies and standard operating procedures and entail only the use of EPA-registered pesticides/herbicides that also comply with state and local regulations. Any vehicle-wildlife collisions shall be immediately reported to security. Observations of potential wildlife problems, including wildlife mortality, shall be immediately reported to the BLM or other appropriate agency authorized officer. Procedures for removal of wildlife carcasses on-site and along access roads shall be addressed in the Animal, Pest, and Vegetation Control Plan, to avoid vehicle-related mortality of carrion-eaters. If pesticides/herbicides are to be used on the site, an Animal, Pest, and Vegetation Control Plan shall be developed to ensure that applications will be conducted within the framework of designated lead agencies and will entail the use of only EPA-registered pesticides/herbicides that are nonpersistent and immobile and approved by the designated lead agency.

Table B-2 *(continued)*
Required Plans

Paleontological Resource Management Plan (Solar & IM 2009-043)	If paleontological resources are present at the site or if areas with a high potential to contain paleontological material have been identified, a Paleontological Resources Management Plan shall be developed. This shall include a mitigation plan; mitigation may include avoidance, removal of fossils (data recovery), stabilization, monitoring, protective barriers and signs, or other physical or administrative protection measures. The Paleontological Resources Management Plan also shall identify measures to prevent potential looting, vandalism, or erosion impacts and address the education of workers and the public to make them aware of the consequences of unauthorized collection of fossils on public land.
Spill Prevention & Emergency Response Plan (Solar & IM 2009-043)	As part of a Spill Prevention and Emergency Response Plan, measures to prevent potential groundwater and surface water contamination shall be identified. As part of a Spill Prevention and Emergency Response Plan identify sources, locations, and quantities of potential chemical releases (through spills, leaks, or fires) and to define response measures and notification requirements shall be developed and followed to reduce potential for soil contamination. The plan shall also identify individuals and their responsibilities for implementing the plan. Shall be developed that considers sensitive ecological resources. Spills of any toxic substances shall be promptly addressed and cleaned up before they can enter aquatic or other sensitive habitats due to runoff or leaching. A comprehensive Spill Prevention and Emergency Response Plan shall be developed for the facility that meets the following criteria: is written, periodically updated, and made available to the entire workforce; contains procedures for timely notification of appropriate authorities, including the designated BLM land manager; provides spill/emergency contingency planning for each type of hazardous material present, including abatement or stabilizing of release, recovery of spilled product, and remediation of impacted environmental media; is supported by the strategic deployment of appropriate spill response materials and equipment, including PPE for individuals with spill or emergency response assignments; provides for prompt response to spills and timely delivery of recovered spill materials and contaminated environmental media to appropriately permitted off-site treatment or disposal facilities; formally assigns spill and emergency response duties to specified individuals; provides and documents appropriate training to individuals with spill or emergency response assignments; provides for the prompt response to spills and timely delivery of recovered spill materials and contaminated environmental media to appropriately permitted off-site treatment or disposal facilities; provides general awareness training to remaining facility personnel; and provides for written documentation of each event, including root cause analysis, corrective actions taken, and a characterization of the resulting environmental or health and safety impacts.
Stormwater Management Plan (Solar & IM 2009-043)	A Stormwater Management Plan shall be developed for the site to ensure compliance with applicable regulations and prevent off-site migration of contaminated stormwater, changes in pre-project storm hydrographs, or increased soil erosion. • Siting in identified 100-yr floodplains shall not be allowed within the development. • Projects developers shall maintain the pre-development flood hydrograph for all storms up to and including the 100-yr rainfall event. All stormwater retention and/or infiltration and treatment systems shall also be designed for all storms up to and including the 100-yr storm event.

Table B-2 *(continued)*
Required Plans

Traffic Management Plan (Solar & IM 2009-043)	A traffic management plan shall be prepared for the site access roads to ensure that no hazards would result from increased truck traffic and that traffic flow would not be adversely impacted. This plan shall incorporate measures such as informational signs, flaggers when equipment may result in blocked throughways, and traffic cones to identify any necessary changes in temporary lane configuration. A Traffic Management Plan shall be prepared for the site access roads to control hazards that could result from increased truck traffic (most likely during construction or decommissioning), to ensure that traffic flow would not be adversely affected and that specific issues of concern (e.g., the locations of school bus routes and stops) are identified and addressed. This plan shall incorporate measures such as informational signs, flaggers when equipment may result in blocked throughways, and traffic cones to identify any necessary changes in temporary lane configuration. The plan shall be developed in coordination with local planning authorities. Transportation Plan (IM 2009-043) A transportation plan shall be developed, particularly for the transport of turbine components, main assembly cranes, and other large pieces of equipment. The plan shall consider specific object sizes, weights, origin, destination, and unique handling requirements and shall evaluate alternative transportation approaches. In addition, the process to be used to comply with unique state requirements and to obtain all necessary permits shall be clearly identified. Operators shall consult with local planning authorities regarding increased traffic during the construction phase, including an assessment of the number of vehicles per day, their size, and type. Specific issues of concern (e.g., location of school bus routes and stops) shall be identified and addressed in the traffic management plan.
Trash Abatement Plan	A Trash Abatement Plan shall be developed that focuses on containing trash and food in closed containers and removing them periodically to reduce their attractiveness to opportunistic species, such as common ravens, coyotes, and feral dogs that could serve as predators on native wildlife and special status animals.
Water Resources Monitoring & Mitigation Plan	Project developers who plan to use groundwater shall develop and implement a groundwater Water Resources Monitoring and Mitigation Plan, which includes • Monitoring the effects of groundwater withdrawal for project uses, vegetation restoration and dust control uses during decommissioning, and aquifer recovery after project decommissioning. • Monitoring changes in flows, volumes, and water quality during construction and operations, as well as their recovery during decommissioning. • Monitoring frequency shall be decided on a site-specific basis and in coordination with federal, state, and local agencies managing surface water resources of the region. • Groundwater- and/or surface water-monitoring activities shall be as outlined in the established groundwater monitoring plan for the site. A Water Resources Monitoring and Mitigation Plan shall be developed for each project in consultation with local and state agencies. Changes in surface water or groundwater quality (e.g., chemical contamination, increased salinity, increased temperature, decreased dissolved oxygen, and increased sediment loads) or flow that result in alteration of terrestrial plant communities or communities in wetlands, springs, seeps, intermittent streams, perennial streams, and riparian areas (including alterations of cover and community structure, species composition, and diversity) off the project site shall be avoided to the extent practicable. A monitoring plan shall be developed that determines the effects of groundwater withdrawals on plant communities. See measures applicable to protecting water quality.

Table B-2 *(continued)*
Required Plans

Wind Erosion Management Plan	A wind erosion management plan should be prepared for projects located in a documented high wind area. The plan shall ensure protection of water quality, air quality and soil resources on the project site. The plan would develop mitigation measures that prevent excessive and unnatural soil deposition and erosion.
Worker Environmental Awareness Program	Develop a project-specific worker environmental awareness program (WEAP) that meets the approval of the issuing BLM office and would be carried out during all phases of the project (site mobilization, ground disturbance, grading, construction, operation, closure/decommissioning, or project abandonment, and restoration/reclamation activities). Identify in the WEAP biological resources and BMPs for minimizing impacts to resources. Provide interpretation for non-English speaking workers, and provide the same instruction for new workers prior to their working onsite. Keep in project field construction office files the names of onsite personnel (for example, surveyors, construction engineers, employees, contractors, contractor's employees, subcontractors) who have participated in the education program. At a minimum, include the following in the program: • Photos and habitat descriptions for special status species that may occur on the project site and information on their distribution, general behavior, and ecology. • Species sensitivity to human activities. • Legal protections afforded the species. • Project BMPs for protecting species. • State and federal law violation penalties. • Worker responsibilities for trash disposal and safe/ humane treatment of special status species found on the project site, associated reporting requirements, and specific required measures to prevent taking of threatened or endangered species. • Handout materials summarizing the contractual obligations and protective requirements specified in project permits and approvals. • Project site speed limit requirements and penalties.
Health and Safety Program	A health and safety program shall be developed to protect workers during site characterization, construction, operation, and decommissioning of a renewable energy project. The program shall identify all applicable federal and state occupational safety standards and establish safe work practices addressing all hazards, including requirements for developing the following plans: general injury prevention; PPE requirements and training; respiratory protection; hearing conservation; electrical safety; hazardous materials safety and communication; housekeeping and material handling; confined space entry; hand and portable power tool use; gas-filled equipment use; and rescue response and emergency medical support, including on-site first-aid capability. In addition, the health and safety program shall address OSHA standard practices for the safe use of explosives and blasting agents (e.g., if used to construct foundations for power tower facilities); measures for reducing occupational EMF exposures; the establishment of fire safety evacuation procedures; and required safety performance standards (e.g., electrical system standards and lighting protection standards). The program shall include training requirements for applicable tasks for workers and establish procedures for providing required training to all workers. Documentation of training and a mechanism for reporting serious accidents to appropriate agencies shall be established.

Table B-2 *(continued)*
Required Plans

Noise Monitoring & Mitigation Plan	Prepare a noise monitoring and mitigation plan. Design the project to: minimize noise impacts to sensitive noise receptors, limit increases to less than a five to 10 dBA increase above ambient levels, and not exceed local noise standards. Address project generated noise impacts as much as possible. Consider acquiring lands to serve as buffers around the proposed facilities.
Bat & Avian Protection Plan	Protect bats and migratory birds while improving conservation, safety, and reliability for utility customers. Projects will be analyzed on a case-by-case basis to determine whether development of an avian protection plan (APP) and/or avian bat protection plan (ABPP) is necessary.
Facility Vector (such as mosquitoes or rodents) Control Plan	A Facility Vector Control Plan that meets the permitting agency approval and would be implemented during all phases of the project.
Hazardous Materials and Waste Management Plan	Shall address the selection, transport, storage, and use of all hazardous materials needed for construction, operation, and decommissioning of the facility for local emergency response and public safety authorities and for the regulating agency, and shall address the characterization, on-site storage, recycling, and disposal of all resulting wastes. The plan shall, at a minimum, include the following: facility identification; comprehensive hazardous materials inventory; Material Safety Data Sheets (MSDS) for each type of hazardous material; emergency contacts and mutual aid agreements, if any; site map showing all hazardous materials and waste storage and use locations; copies of spill and emergency response plans and hazardous materials-related elements of a decommissioning/closure plan.
Construction and Operation Waste Management Plan	Shall identify the waste streams that are expected to be generated at the site and addresses hazardous waste determination procedures, waste storage locations, waste-specific management and disposal requirements, inspection procedures, and waste minimization procedures. The plan shall address all solid and liquid wastes that may be generated at the site in compliance with the CWA requirements to obtain the project's NPDES permit.

Table B-3
Required Studies

Transmission interconnection study	In applications to appropriate lead agencies, provide a copy of the electric transmission interconnection study from the appropriate control agency. Include in the interconnection study an identification of the transmission impacts beyond the first point of interconnection and acceptable measures to mitigate/alleviate impacts to the transmission network system. When more than one alternative mitigation measure is identified, indicate in the applications the measure selected by the project developer. Provide for each selected mitigation measure, an environmental analysis sufficient to meet the CEQA requirements for indirect project impacts.
Preliminary hydrologic study	Project developers shall conduct a preliminary hydrologic study demonstrating a clear understanding of the local surface water and groundwater hydrology. At a minimum this hydrologic study shall include: • The relationship of the project site hydrologic basin to the basins in the region • Identification of all surface water bodies (including rivers, streams, ephemeral washes/drainages, lakes, wetlands, playas and floodplains) • Identification of all applicable groundwater aquifers • Preliminary estimates of physical characteristics of surface water features, groundwater aquifers, and the regional climate (seasonal and long term).
Detailed hydrologic study	Developers shall be required to conduct a detailed hydrologic study demonstrating a clear understanding of the local surface water and groundwater hydrology. At a minimum this hydrologic study shall include: • Quantification of physical characteristics describing surface water features, such as streamflow rates, stream cross-sections, channel routings, seasonal flow rates (intermittent streams), peak flow rates (ephemeral washes/drainages), sediment characteristics and transport rates, lake depths, and surface areas of lakes, wetlands, and floodplains • Hydrologic analysis and modeling to define the 100-yr, 24-hour rainfall event for the project area and calculation of projected runoff from this storm at site; • Hydrologic analysis and modeling to identify 100-yr floodplain boundaries of any surface water feature on the site; • Quantification of physical characteristics describing the groundwater aquifer, such as physical dimensions of the aquifer, sediment characteristics, confined/unconfined conditions, hydraulic conductivity and transmissivity distribution of the aquifer, groundwater surface elevations, and groundwater flow processes (direction, recharge/discharge, current basin extractions, and surface water-groundwater connectivity); • Quantification of regional climate including seasonal and long-term information on temperatures, precipitation, evaporation, and evapotranspiration; and • Quantification of the sustainable yield of surface waters and groundwater available to the project. Project developers shall evaluate the water sources in terms of existing water rights and management plans for adequacy to serve project demands while maintaining aquatic, riparian, and other water-dependent resources.
Comprehensive groundwater basin analysis	If groundwater use is proposed, project developers shall ensure that a comprehensive analysis of the groundwater basin is provided and that the following potential significant impacts are evaluated: • Creation or exacerbation of overdraft conditions and their potential to cause subsidence and loss of aquifer storage capacity

Table B-3 *(continued)*
Required Studies

	• Use that causes injury to other water users and rights claimants in the basin • Estimates of the total cone of depression considering cumulative drawdown from all potential pumping in the basin, including the project, for the life of the project through the decommissioning phase. • Changes in water quality that affect other beneficial use; and • Effects on groundwater dependent ecosystems such as springs, seeps, and wetlands that provide water for plants and animals.
Geomorphology Technical Report	Retain the services of a geoarchaeologist, when appropriate, to investigate and complete a geomorphology technical report. Include the following elements: • Reconstruct the historical geomorphology of the project's Area of Potential Effects (APE); • Map and date the sediments of the landforms in that area; • Assess whether buried archaeological deposits may be present and subject to project impacts.
Safety Assessment	A safety assessment shall be conducted to describe potential safety issues and the means that would be taken to mitigate them, including issues such as site access; construction; safe work practices; glare exposure from mirrors, heliostats, and/or power towers; security; heavy equipment transportation; traffic management; emergency procedures; and fire control.
Health Risk Assessment	A health risk assessment shall evaluate potential cancer and noncancer risks to workers and the general public from exposure to facility emission sources during construction and operations. If potential risks are found to exceed applicable threshold levels, measures shall be taken to decrease emissions from the source.

Table B-4
Best Management Practices

No.	Topic	Description of Measure	Phase
Air Quality			
1	Emissions	On-site vehicle use shall be reduced to the extent feasible.	C, O, D
2	Emissions	Idling of diesel equipment shall be limited to no more than 10 minutes unless idling must be maintained for proper operation (e.g., drilling, hoisting, and trenching).	C, O, D
3	Emissions	Consider using electric vehicles, biodiesel, or alternative fuels during construction and operation phases to reduce the project's criteria and GHG pollutant emissions.	C, O, D
4	Fugitive dust	Workers shall be trained to comply with the speed limit, use good engineering practices, minimize drop height of materials, and minimize disturbed areas.	C, O, D
5	Fugitive dust	Construction shall be staged to limit the exposed area at any time, whenever practical.	C, O, D
6	Fugitive dust	Access to the construction site and staging areas shall be limited to authorized vehicles only through the designated treated roads.	C, O, D
7	Fugitive dust	Access roads, on-site roads, and parking lots shall be surfaced with aggregate with hardness sufficient to prevent vehicles from crushing the aggregate and thus causing dust or compacted soil conditions. Paving could also be used on access roads and parking lots. Alternatively, chemical dust suppressants or durable polymeric soil stabilizers shall be used on these locations.	C, O, D
8	Fugitive dust	All unpaved roads, disturbed areas (e.g., areas of scraping, excavation, backfilling, grading, and compacting), and loose materials generated during project activities shall be watered as frequently as necessary to minimize fugitive dust generation. In water-deprived locations, water spraying shall be limited to active disturbance areas only and non-water-based dust control measures shall be implemented in areas with intermittent or non-heavy use, such as stockpiles or access roads.	C, O, D
9	Fugitive dust	Speed limits (e.g., 10 mph [16 km/h]) within the construction site shall be posted with visible signs and enforced to minimize airborne fugitive dust.	C, D
10	Fugitive dust	All vehicles transporting loose materials traveling on public roads shall be covered, and loads shall be sufficiently wet and kept below the freeboard of the truck.	C, O, D
11	Fugitive dust	Tires of all construction-related vehicles shall be inspected and cleaned as necessary to be free of dirt prior to entering paved public roadways.	C, D
12	Fugitive dust	Visible trackout or runoff dirt on public roadways from the construction site shall be cleaned (e.g., through street vacuum sweeping).	C, D

Table B-4 *(continued)*
Best Management Practices

No.	Topic	Description of Measure	Phase
13	Fugitive dust	Topsoil from all excavations and construction activities shall be salvaged and reapplied during reclamation or, where feasible, used for interim reclamation by being reapplied to construction areas not needed for facility operation as soon as activities in that area have ceased. Unused topsoil and other erosion-susceptible material shall be removed from the site via covered trucks.	C, O, D
14	Fugitive dust	Use wind erosion control techniques (such as windbreaks, water, chemical dust suppressants, and/or vegetation) where soils are disturbed in construction, access and maintenance routes, and materials stock pile areas. Keep related windbreaks in place until the soil is stabilized or permanently covered with vegetation. Wind fences shall be installed around disturbed areas that could affect the area beyond the site boundaries (e.g., nearby residences).	C, O, D
15	Fugitive dust	All soil disturbance activities shall be minimized and travel on unpaved roads shall be conducted during periods of low winds and stable conditions typical of early morning hours from late fall to early spring, to the extent practicable, which could significantly lower potential impacts on ambient air quality.	C, O, D
16	Fugitive dust	Any stockpiles created shall be kept on-site, with an upslope barrier in place to divert runoff. Stockpiles shall be sprayed with water, covered with tarpaulins, and/or treated with appropriate dust suppressants, especially in preparation for high wind or storm conditions. Compatible native vegetative plantings may also be used to limit dust generation for stockpiles that will be inactive for a relatively long period. Chemical dust suppressants that emit volatile organic compounds (VOCs) shall be avoided within or near O_3 nonattainment areas.	C
17	Fugitive dust	Potential environmental impacts from the use of dust palliatives shall be minimized by taking all necessary measures to keep the chemicals out of sensitive soil and streams. In addition, the application of dust palliatives shall comply with federal, state, and local laws and regulations. Dust palliatives must meet the requirements of the applicable transmission system operator (e.g., Western Area Power Administration construction standards prohibit use of oil as a dust suppressant).	C, O, D
Ecological			
18	Staging areas	As practical, staging and parking areas shall be located within the site of the utility-scale renewable energy facility to minimize habitat disturbance in areas adjacent to the site.	C, O, D
19	Construction activities	Before beginning construction, delineate the boundaries of areas to be disturbed using temporary construction fencing and/or flagging, and confine disturbances, project vehicles, and equipment to the delineated project areas.	C, D
20	Construction	To the extent practicable, work personnel shall stay within the ROW and/or easements.	C, O, D

Table B-4 *(continued)*
Best Management Practices

No.	Topic	Description of Measure	Phase
21	Fugitive dust	If the application of water is needed to abate dust in construction areas and on dirt roads, use the least amount needed to meet safety and air quality standards and prevent the formation of puddles, which could attract wildlife to construction sites.	C, D
22	Traffic	Existing access roads, utility corridors, and other infrastructure shall be used to the maximum extent feasible.	C, O, D
23	Traffic	Plant species that would attract wildlife shall not be planted along high speed or high-traffic roads. If applicable, an avian and bat protection plan will be developed.	C, O, D
24	Traffic	Road closures shall be considered during crucial periods (e.g., extreme winter conditions, calving/fawning seasons). Personnel shall be advised to minimize stopping and exiting their vehicles in the winter ranges of large game while there is snow on the ground.	C, O, D
25	Helicopter use	The minimization of habitat disturbance shall be considered through utilizing helicopters for construction to minimize the need for access roads, and by locating transmission facilities in previously disturbed areas. Existing utility corridors and other support structures shall be utilized to the maximum extent feasible.	C, O, D
26	Noise	Noise reduction devices (e.g., mufflers) shall be employed to minimize the impacts on wildlife and special status species populations. Explosives shall be used only within specified times and at specified distances from sensitive wildlife or surface waters as established by the designated lead agency or other federal and state agencies. Operators shall ensure that all equipment is adequately muffled and maintained in order to minimize disturbance to wildlife	C, O, D
27	Noise	Minimize construction and operation related noise levels to minimize impacts to wildlife.	C, O, D
28	Power lines	Place low and medium voltage connecting power lines underground whenever possible. In certain circumstances, burial of the lines may be prohibitively expensive (for example in shallow bedrock areas) or may cause unacceptable impacts to wetland habitats and dependent species. Overhead lines may be acceptable: • if sited away from high bird crossing locations, such as between roosting and feeding areas or between lakes, rivers, and nesting areas; and/or • when the structures parallel tree lines or are otherwise screened so that collision risk is reduced.	S, C
29	Aquatic habitat	The placement of transmission towers within aquatic and wetland habitats shall be avoided whenever feasible. If towers must be placed within these habitats, they shall not impede flows or fish passage.	S, C, O

Table B-4 *(continued)*
Best Management Practices

No.	Topic	Description of Measure	Phase
30	Aquatic habitat	Low-water crossings (fords) shall be used only as a last resort and then during the driest time of the year. Rocked approaches to fords shall be used. The pre-existing stream channel, including bed and banks, shall be restored after the need for a low-water ford has passed.	C, O, D
31	Habitat	To reduce the extent of habitat disturbance during construction and operation, existing access roads, utility corridors, and other infrastructure shall be used to the maximum extent feasible and foot and vehicle traffic through undisturbed areas shall be minimized.	C, O, D
32	Habitat	Areas left in a natural condition during construction (e.g., wildlife crossings) shall be maintained in as natural a condition as possible within safety and operational constraints.	C, O, D
33	Habitat	Projects shall be planned to avoid, minimize, or mitigate impacts on aquatic habitats, wetland habitats, waters of the United States, other special aquatic sties, unique biological communities, crucial wildlife habitats, breeding areas, and special status species locations and habitats, including designated critical habitat. Project planning shall be coordinated with the appropriate federal and state resource management agencies.	S
34	Habitat	Habitat loss, habitat fragmentation, and resulting edge habitat due to project development shall be minimized to the extent practicable. Habitat fragmentation could be reduced by consolidating facilities (e.g., access roads and utilities could share common ROWs, where feasible), reducing the number of access roads to the minimum amount required, minimizing the number of stream crossings within a particular stream or watershed, and, locating facilities in areas where habitat disturbance has already occurred. Individual project facilities shall be located and designed to minimize disruption of animal movement patterns and connectivity of habitats.	S
35	Habitat	The number of areas where wildlife could hide or be trapped (e.g., open sheds, pits, uncovered basins, and laydown areas) shall be minimized. All pits shall contain wildlife escape ramps. For example, an uncovered pipe that has been placed in a trench shall be capped at the end of each workday to prevent animals from entering the pipe. If a special status species is discovered inside a component, that component must not be moved or, if necessary, moved only to remove the animal from the path of activity, until the animal has escaped.	C, O, D
36	Birds	Locating renewable energy power facilities near open water or other areas known to attract a large number of birds shall be avoided.	S
37	Birds/bats	Tall structures shall be located to avoid known flight paths of birds and bats.	S
38	Birds/ raptors	Project proponents should establish buffer zones and protection, mitigation, and monitoring plans for active nests detected during surveys.	S, C
39	Birds	Although it is unclear whether tubular or lattice towers pose less risk, it is recommended that tubular towers or best available technology be used to reduce bird perching opportunities on turbines.	S, C, O

Table B-4 *(continued)*
Best Management Practices

No.	Topic	Description of Measure	Phase
40	Raptors	Turbines shall be configured to avoid landscape features known to attract raptors if site studies show that placing turbines there would pose a significant risk to raptors.	S
41	Special status species	In consultation with permitting agencies, avoid special status species or unique plant assemblages when installing and maintaining transmission line towers/poles, access roads, pulling sites, and storage and parking areas adjacent to linear facilities.	S, C, O
42	Special status species	During all project phases, buffer zones shall be established around sensitive habitats, and project facilities and activities shall be excluded or modified within those areas, to the extent practicable.	C, O, D
43	Special status species	Project activities shall not be located in or near occupied habitats of special status animal species. Buffer zones shall be established around these areas (e.g., identified in the land use plan or substantiated by best available information or science), to prevent any destructive impacts associated with project activities.	S
44	Special status habitat	Prior to any ground-disturbing activity, seasonally appropriate walkthroughs shall be conducted by a qualified biologist or team of biologists to ensure that important or sensitive species or habitats are not present in or near project areas. Attendees at the walkthrough shall include appropriate federal agency representatives, state natural resource agencies, and construction contractors, as appropriate. Habitats or locations to be avoided (with appropriately sized buffers) shall be clearly marked.	C, O, D
45	Vegetation	Project-specific vegetation management plans shall investigate possibilities of revegetating parts of the renewable energy project area. Where revegetation is accomplished, fire breaks are required, such that vegetated areas would not result in increased fire hazard.	S, C, D
46	Wetlands	Where a pipeline trench may drain a wetland, trench breakers shall be constructed and/or the trench bottom shall be sealed to maintain the original wetland hydrology.	C, O, D
47	Noxious weeds	The establishment and spread of invasive species and noxious weeds within the ROW and in associated areas of ground surface disturbance or vegetation cutting shall be prevented. The area shall be monitored regularly and invasive species should be eradicated immediately.	C, O, D
48	Herbicide use	Herbicide use shall be limited to nonpersistent, immobile substances. Only herbicides with low toxicity to wildlife and nontarget native plant species shall be used, as determined in consultation with the USFWS. The typical herbicide application rate shall be used rather than the maximum application rate, where effective. All herbicides shall be applied in a manner consistent with their label requirements and in accordance with guidance provided in the Final PEIS on vegetation treatments using herbicides (BLM 2007c). No herbicides shall be used near or in surface water, streams (including ephemeral, intermittent, or perennial), riparian areas, or wetlands. Setback distances shall be determined through coordination with federal and state resource management	C, O, D

Table B-4 *(continued)*
Best Management Practices

No.	Topic	Description of Measure	Phase
		agencies. Before herbicide treatments are begun, the designated lead agency or an authorized contractor shall conduct nest searches in and around treatment areas to minimize impacts on migratory birds.	
49	Waste	Construction debris, especially treated wood, shall not be stored or disposed of in areas where it could come in contact with aquatic habitats.	C, O, D
50	Reclamation	Access roads shall be reclaimed when they are no longer needed. However, seasonal restrictions (e.g., nest and brood rearing) shall be considered, as appropriate (e.g., identified in the land use plan or substantiated by best available information or science).	C, O, D
51	Reclamation	All holes and ruts created by removal of structures and access roads shall be filled or graded.	D
52	Reclamation	While structures are being dismantled, care shall be taken to avoid leaving debris on the ground in areas in which wildlife regularly move.	D
53	Reclamation	The facility fence shall remain in place for several years to help reclamation (e.g., would preclude large mammals and vehicles from disturbing revegetation efforts).	D
54	Reclamation	For a repowering or retrofit project, remove and stabilize roads and facilities that are no longer needed; re-seed with native plants appropriate for the soil conditions and adjacent habitat. Derive plants from local seed sources where feasible. The term "local" in this context means seed sources with a genetic makeup that do not vary substantially from seeds or plants found at the disturbed location.	C
55	Biological monitor	Vehicles and site workers shall avoid entering aquatic habitats such as streams and springs during site characterization activities until surveys by qualified biologists have evaluated the potential for unique flora and fauna to be present.	C, O, D
Hazardous Materials			
56	Training	Ensure that on-site workers are fully trained to properly handle and are informed about each of the hazardous materials to be used on-site.	C, O, D
57	Hazardous materials	Pollution prevention opportunities shall be identified and implemented, including material substitution of less hazardous alternatives, recycling, and waste minimization.	C, O, D
58	Hazardous materials	Written procedures for the storage, use, and transportation of each type of hazardous material present shall be provided, including all vehicle and equipment fuels.	S, C, O, D
59	Hazardous materials	Authorized users for each type of hazardous material shall be identified.	C, O, D

Table B-4 *(continued)*
Best Management Practices

No.	Topic	Description of Measure	Phase
60	Hazardous materials	Hazardous materials and waste storage areas or facilities shall be formally designated and access restricted to authorized personnel. Construction debris, especially treated wood, shall not be disposed of or stored in areas where it could come in contact with aquatic habitats.	S, C, O, D
61	Hazardous materials	Hazardous materials and waste storage areas must be consistent with accepted industry practices as well as applicable federal, state, and local regulations and that include, at a minimum, containers constructed of compatible materials, properly labeled, and in good condition; secondary containment features for liquid hazardous materials and wastes; physical separation of incompatible chemicals; and fire-fighting capabilities when warranted.	C, O, D
62	Hazardous materials	Procedures shall be established for fuel storage and dispensing, including shutting off vehicle (equipment) engines; using only authorized hoses, pumps, and other equipment in good working order; maintaining appropriate fire and spill response materials at equipment-fueling stations; providing emergency shutoffs for fuel pumps; ensuring that fueling stations are paved; ensuring that both aboveground fuel tanks and fueling areas have adequate secondary containment; prohibiting smoking, welding, or open flames in fuel storage and dispensing areas; equipping the area with fire suppression devices, as appropriate; conducting routine inspections of fuel storage and dispensing areas; requiring prompt recovery and remediation of all spills, and providing for the prompt removal of all fuel and fuel tanks used to support construction vehicles and equipment at the completion of facility construction and decommissioning phases.	S, C, O, D
63	Hazardous materials	Good waste management practices shall be adopted for handling, storing, and disposing of wastes generated by a construction project to prevent the release of waste materials into stormwater discharges; waste management includes the following: spill prevention and control, construction debris and litter management, concrete waste management, and liquid waste management.	C, O, D
64	Hazardous materials storage	To the greatest extent practical and considering the remoteness of a given facility, "just-in-time" ordering procedures shall be employed that are designed to limit the amounts of hazardous materials present on the site to quantities minimally necessary to support continued operations; excess hazardous materials shall receive prompt disposition.	C, O, D
65	Herbicide/ pesticide use	Avoid rinsing herbicide/pesticide spray tanks in or near water bodies.	C, O, D
66	Spills	Berms and other controls shall be used at facilities to prevent off-site migration of any leaked or spilled HTF, TES fluids, or any other chemicals stored or used at the site.	C, O, D
67	Spills	Remediate hazardous product leaks and chemical releases that constitute a Recognized Environmental Condition before completing decommissioning.	D

Table B-4 *(continued)*
Best Management Practices

No.	Topic	Description of Measure	Phase
68	Transporting hazardous materials	Dedicated areas with secondary containment shall be established for off-loading hazardous materials transport vehicles.	C, O, D
69	Refueling	Refueling areas shall be located away from surface water locations and drainages and on paved surfaces; features shall be added to direct spilled materials to sumps or safe storage areas where they can be subsequently recovered.	S, C, O, D
70	Vehicles	All vehicles and equipment shall be in proper working condition to ensure that there is no potential for leaks of motor oil, antifreeze, hydraulic fluid, grease, or other hazardous materials.	C, O, D
71	Inspections	Written procedures shall be established for inspecting hazardous materials and waste storage areas and for plant systems containing hazardous materials; identified deficiencies and their resolution shall be documented.	S, C, O, D
72	Waste removal	Schedules shall be established for the regular removal of wastes (including sanitary wastewater generated in temporary, portable sanitary facilities) for delivery by licensed haulers to appropriate off-site treatment or disposal facilities.	C, O, D
73	Decommissioning	During facility decommissioning, the following shall occur: emergency response capabilities shall be maintained throughout the decommissioning period as long as hazardous materials and wastes remain on-site, and emergency response planning shall be extended to any temporary material and equipment storage areas that may have been established; temporary waste storage areas shall be properly designated, designed, and equipped; hazardous materials removed from systems shall be properly containerized and characterized, and recycling options shall be identified and pursued; off-site transportation of recovered hazardous materials and wastes resulting from decommissioning activities shall be conducted by authorized carriers; all hazardous materials and waste shall be removed from on-site storage and management areas (including surface impoundments), and the areas shall be surveyed for contamination and remediated as necessary.	D
Health and Safety			
74	Health	A health risk assessment shall evaluate potential cancer and noncancer risks to workers from exposure to facility emission sources during construction and operations. If potential risks are found to exceed applicable threshold levels, measures shall be taken to decrease emissions from the source.	S, C, O, D
75	Safety	A safety assessment shall be conducted to describe potential safety issues and the means that would be taken to mitigate them, including issues such as site access; construction; safe work practices; glare exposure from mirrors, heliostats, and/or power towers; security; heavy equipment transportation; traffic management; emergency procedures; and fire control.	S, C, O, D

Table B-4 *(continued)*
Best Management Practices

No.	Topic	Description of Measure	Phase
76	EMF	Measures shall be considered to reduce occupational EMF exposures, such as backing electrical generators with iron to block EMF, shutting down generators when working in the vicinity, and otherwise limiting exposure time and proximity while generators are running.	S
77	Traffic	Operators shall consult with local planning authorities regarding increased traffic during the construction phase, including an assessment of the number of vehicles per day, their size, and type. Specific issues of concern (e.g., location of school bus routes and stops) shall be identified and addressed in the traffic management plan.	O
78	Firearms	Prohibit workers or visitors, with the exception of law enforcement personnel, from bringing firearms or weapons to the project site.	C, O, D
79	Wastewater	Any wastewater generated in association with temporary, portable sanitary facilities shall be periodically removed by a licensed hauler and introduced into an existing municipal sewage treatment facility. Portable sanitary facilities provided for construction crews shall be adequate to support expected on-site personnel.	C, O, D
Lands and Realty			
80	Land use	To plan for efficient use of the land, necessary infrastructure requirements shall be consolidated wherever possible, and current transmission and market access shall be evaluated carefully.	S
81	Overhead lines	All electrical collector lines shall be buried in a manner that minimizes additional surface disturbance (e.g., along roads or other paths of surface disturbance). Overhead lines may be used in cases where burial of lines would result in further habitat disturbance.	S
82	Monitoring	Site monitoring protocols defined in the POD shall be implemented. These will incorporate monitoring program observations and additional mitigation measures into standard operating procedures and BMPs to minimize future environmental impacts.	S, C
83	Monitoring	All control and mitigation measures established for the project in the POD and the resource-specific management plans that are part of the POD shall be maintained and implemented throughout the construction phase, as appropriate.	S, C
84	Monitoring	Results of monitoring program efforts shall be provided to the BLM authorized officer.	C, D
85	Decommissioning	All management plans, BMPs, and stipulations developed for the construction phase shall be applied to similar activities during the decommissioning phase.	D
Livestock Grazing			
86	Roads	Access roads shall be constructed, improved, and maintained to minimize impact on grazing operations. Road design would include appropriate fencing, cattle guards, and signs.	C, O

Table B-4 *(continued)*
Best Management Practices

No.	Topic	Description of Measure	Phase
Minerals			
87	Mining	Transmission lines shall be located to avoid conflicts with mining activities in areas with active mineral development.	S
Native American Concerns			
88	Training	Prior to construction, consideration shall be given to training contractor personnel whose activities or responsibilities could affect resources of significance to Native Americans during construction. When there is a reasonable expectation of encountering unidentified cultural resources during construction, monitoring of construction shall be considered to minimize impacts on resources of significance to Tribes to the extent possible.	S, C, O, D
89	Visual	Visual intrusion on sacred areas and places of traditional importance shall be avoided to the extent practical through the selection of renewable energy facility location and technology. When avoidance is not possible, timely and meaningful consultation with the affected Tribe(s) shall be conducted to formulate a mutually acceptable plan to minimize or mitigate the adverse effect.	S
90	Noise	Standard noise mitigation measures shall be employed when near sacred sites to minimize the impacts of noise on culturally significant areas.	C, O, D
91	Health and safety	Health and safety mitigation measures for the general public shall be employed when renewable energy facilities are located near to Native American traditional use areas in order to minimize potential health and safety impacts to Native Americans.	C, O, D
92	Mitigation	All mitigation measures listed in cultural resources would also apply to historic properties of concern to Native Americans.	S, C, O, D
Noise – Vibration			
93	Construction	Siting of stationary construction equipment (e.g., compressors and generators) shall be far from nearby residences and other sensitive receptors.	C, O, D
94	Equipment	If noise from a transformer becomes an issue, a new transformer with reduced flux density, which generates noise levels as much as 10 to 20 dB lower than National Electrical Manufacturers Association (NEMA) standard values, could be installed. Alternatively, barrier walls, partial enclosures, or full enclosures could be adopted to shield or contain the transformer noise, depending on the degree of noise control needed.	O
95	Equipment	Permanent sound-generating facilities (e.g., compressors, pumps) shall be sited away from residences and other sensitive receptors. In areas of known conflicts, consideration shall be given to the installation of acoustic screening.	O

Table B-4 *(continued)*
Best Management Practices

No.	Topic	Description of Measure	Phase
96	Equipment	Where feasible, low-noise systems (e.g., for ventilation systems, pumps, generators, compressors, and fans) shall be incorporated and equipment selected that has no prominent discrete tones.	C, O, D
97	Equipment	All equipment shall be maintained in good working order in accordance with manufacturers' specifications. For example, suitable mufflers and/or air-inlet silencers shall be installed on all internal combustion engines (ICEs) and certain compressor components.	C, O, D
98	Equipment	All equipment shall have sound-control devices no less effective than those provided on the original equipment. All construction equipment used shall be adequately muffled and maintained. Properly maintain mufflers, brakes, and loose items on construction and operation related vehicles to minimize noise and ensure safe operations. Operate trucks as quietly as possible, while considering local conditions. Advise about downshifting and vehicle operations in residential communities to keep truck noise to a minimum.	C, O, D
99	Equipment	Install mufflers on diesel and gas-driven engine air coolers and exhaust stacks. Equip emergency pressure relief valves and steam blow-down lines with silencers to limit noise levels.	C, O, D
100	Equipment	If residences or sensitive receptors are nearby, noisy equipment, such as turbines and motors, shall be placed in enclosures.	O
101	Equipment	If a wet-cooling tower is to be used, the louvered side shall be sited to face away from sensitive human receptors. The cooling tower shall be located such that nearby equipment can act as a barrier and serve as additional noise reduction. Quieter fans shall be selected in the facility design, and fans shall be operated at a lower speed, particularly if operating at night. If a high degree of reduction is required, silencers shall be used on the fan stacks.	S, O
102	Equipment	Use variable speed turbines or pitched blades to lower rotational speed.	S, O
103	Helicopter	Helicopter flights at low altitude (under 1,500 ft. [457 m]) near noise-sensitive receptors shall be minimized except at locations where only helicopter activities can perform the task.	C, O, D
104	Vehicles	Construction and decommissioning activities and construction traffic shall be scheduled to minimize disruption to nearby residents and existing operations surrounding the project areas.	C, O, D
105	Vehicles	All vehicles traveling within and around the project area shall be operated in accordance with posted speed limits to reduce vehicular noise levels.	C, O, D
106	Safety	Warning signs shall be posted in high-noise areas, and a hearing protection program shall be implemented for work areas with noise in excess of 85 dBA.	C, O, D

Table B-4 *(continued)*
Best Management Practices

No.	Topic	Description of Measure	Phase
107	Timing	Whenever feasible, different noisy activities shall be scheduled to occur at the same time, since additional sources of noise generally do not increase noise levels at the site boundary by much. That is, less-frequent but noisy activities would generally be less annoying than lower level noise occurring more frequently.	C, O, D
108	Monitoring/ mitigation	Project developers shall realize that complaints about noise may still occur, even when the noise levels from the facility do not exceed regulatory levels. Accordingly, a noise complaint process and hotline for the surrounding communities shall be implemented, including documentation, investigation, evaluation, and resolution of all legitimate project-related noise complaints.	C, O, D
109	Monitoring/ mitigation	Noise reduction measures that shall be considered include siting noise sources to take advantage of topography and distance, and constructing engineered sound barriers and/or berms or sound-insulated buildings, if needed, to reduce potential noise impacts at the locations of nearby sensitive human receptors. As an alternative, the solar facility generating higher operational noises (e.g., a solar dish engine facility) could take advantage of higher background noises; for example, it could be sited within an existing noisy area, such as close to a well-traveled highway, where the ambient sounds partially mask the noise from the facility.	S, C, O, D
110	Monitoring/ mitigation	Noise control measures (e.g., erection of temporary wooden noise barriers) shall be implemented if noisy activities would be expected near sensitive receptors.	C, O, D
111	Monitoring/ mitigation	If noisy activities, such as blasting or pile driving, are required during the construction or decommissioning period, nearby residents shall be notified in advance.	C, O, D
112	Monitoring/ mitigation	Employ engineering controls, including sound-insulated equipment and control rooms, to reduce the average noise level to appropriate levels in normal work areas.	C, O, D
Recreation			
113	Siting	Renewable energy facilities shall not be placed in areas of unique or important recreation resources.	S
114	Access	Replacement of access lost for OHV use shall be considered as part of the analysis of project-specific impacts.	S
Soils			
115	Construction	Construction shall be conducted in stages to limit the areas of exposed soil at any given time. For example, only land that will be actively under construction in the near term (e.g., within the next 6 to 12 months) should be cleared of vegetation.	C, O, D
116	Construction	Ground-disturbing activities shall be minimized, especially during the rainy season.	C, O, D
117	Construction	Construction on wet soils shall be avoided.	C, O, D

Table B-4 *(continued)*
Best Management Practices

No.	Topic	Description of Measure	Phase
118	Construction	Foundations and trenches shall be backfilled with originally excavated material as much as possible. Excess excavation materials shall be disposed of only in approved areas or, if suitable, stockpiled for use in reclamation activities.	C, O, D
119	Construction	Water or other stabilizing agents shall be used to wet roads in active construction areas and laydown areas to minimize the windblown erosion of soil.	C, O, D
120	Clearing	The clearing and disturbing of sensitive areas (e.g., steep slopes and natural drainages) and other areas shall be avoided outside the construction zone.	C, O, D
121	Disturbance area	The area disturbed by operation of a renewable energy project shall be minimized (e.g., by using existing roads).	C, O, D
122	Disturbance area	The footprint of disturbed areas, including the number and size/length of roads, fences, borrow areas, and laydown and staging areas, shall be minimized.	S, C, O, D
123	Disturbance area	Electrical lines from solar collectors and/or wind turbines shall be buried along existing features (e.g., roads or other paths of disturbance) to minimize the overall area of surface disturbance whenever possible.	C, O, D
124	Disturbance area	Temporary stabilization of disturbed areas that are not actively under construction shall occur.	C, O, D
125	Disturbance area	Permanent stabilization of disturbed areas shall occur during final grading and landscaping of the site.	C, O, D
126	Slopes/ grades	Excessive grades shall be avoided on roads, road embankments, ditches, and drainages, especially in areas with erodible soils.	S, C, O, D
127	Slopes/ grades	Areas with unstable slopes shall be avoided, and local factors that can cause slope instability (e.g., groundwater conditions, precipitation, earthquake activity, slope angles, and the dip angles of geologic strata) shall be identified.	S, C, O, D
128	Slopes/ grades	The creation of excessive slopes shall be avoided during site preparation and construction. Special construction techniques are to be used, where applicable, in areas of steep slopes, erodible soil, and drainage ways.	C, O, D
129	Drainages	Drainage crossings shall be stabilized as quickly as possible, and channel erosion shall be prevented from runoff caused by the project.	C, O, D
130	Stockpiles	Originally excavated materials shall be stockpiled and used for backfill.	C, O, D
131	Fill	Topsoil from all excavation and construction activities shall be salvaged so it can be reapplied to the disturbed area once construction is completed.	C, O, D

Table B-4 *(continued)*
Best Management Practices

No.	Topic	Description of Measure	Phase
132	Fill	Borrow materials shall be obtained only from authorized and permitted sites; existing sites shall be used in preference to new sites.	C, O, D
133	Roads	Abandoned roads and roads no longer needed shall be recontoured and revegetated.	C, O, D
134	Erosion control	Potential soil erosion shall be controlled at culvert outlets with appropriate structures.	C, O, D
135	Erosion control	Catch basins, roadway ditches, and culverts shall be cleaned and maintained regularly.	C, O, D
136	Erosion control	Runoff from slope tops shall be controlled and directed to settling or rapid infiltration basins, and disturbed slopes shall be stabilized as quickly as possible.	C, O, D
137	Erosion control	Sediment-laden waters from disturbed, active areas within the project site shall be retained through the use of barriers and sedimentation devices (e.g., berms, straw bales, sandbags, jute netting, or silt fences).	C, O, D
138	Erosion control	Barriers and sedimentation devices shall be placed around drainages and wetlands to prevent contamination by sediment-laden water.	C, O, D
139	Erosion control	Sediment from barriers and sedimentation devices shall be removed to restore sediment control capacity	C, O, D
140	Erosion control	Routine site inspections shall be conducted to assess the effectiveness and maintenance requirements for erosion and sediment control systems.	C, O, D
141	Operation	All appropriate mitigation measures developed for the construction phase shall be applied to similar activities during the operations phase.	O
142	Revegetation	Project areas are to be replanted with vegetation at spaced intervals to the extent possible to break up areas of exposed soil and reduce soil loss by wind erosion.	C, O, D
143	Revegetation	Native plant communities in disturbed areas shall be restored by natural revegetation or by seeding and transplanting (using weed-free native grasses, forbs, and shrubs), based on BLM recommendations, as early as possible once construction is completed.	C, O, D
144	Reclamation	The original grade and drainage pattern shall be re-established.	C, O, D
145	Reclamation	All areas of disturbed soil shall be reclaimed using weed-free native grasses, forbs, and shrubs. Reclamation activities shall be undertaken as early as possible on disturbed areas.	C, O, D
146	Reclamation	All mitigation measures developed for the construction phase shall be applied to similar activities during the decommissioning/reclamation phase.	D
Transportation			
147	Transportation plans	The project shall be planned to utilize existing roads and utility corridors to the maximum extent feasible and to minimize the number and length/size of new roads, lay-down areas, and borrow areas.	S

Table B-4 *(continued)*
Best Management Practices

No.	Topic	Description of Measure	Phase
148	Design	Access roads and on-site roads shall be surfaced with aggregate materials, wherever appropriate.	S, C, O, D
149	Design	Access roads shall be located to follow natural contours and minimize side hill cuts.	S, C, O, D
150	Design	Roads shall be located away from drainage bottoms and avoid wetlands, if practicable.	S, C, O, D
151	Design	Roads shall be designed so that changes to surface water runoff are avoided and erosion is not initiated.	S, C, O, D
152	Design	Access roads shall be located to minimize stream crossings. All structures crossing streams shall be located and constructed so that they do not decrease channel stability or increase water velocity. Operators shall obtain all applicable Federal and State permits.	S, C, O, D
153	Construction traffic	To mitigate impacts related to the daily commutes of construction workers, the operator may be required to implement local road improvements, provide multiple site access locations and routes, stagger work schedules, and implement a ride-sharing or shuttle program.	C, D
154	Oversize vehicles	Obtain vehicle oversize and overweight permits, as appropriate.	C, O, D
155	Traffic	Traffic shall be restricted to the roads developed for the project. Use of other unimproved roads shall be restricted to emergency situations.	C, O, D
156	Traffic	Signs shall be placed along construction roads to identify speed limits, travel restrictions, and other standard traffic control information. To minimize impacts on local commuters, consideration shall be given to limiting construction vehicles traveling on public roadways during the morning and late afternoon commute time. Consideration shall also be given to opportunities for busing of construction workers to the job site to reduce traffic volumes.	C, O, D
157	Operation	To reduce hazards for incoming and outgoing traffic, as well as to expedite traffic flow, the operator may be required to implement traffic control measures, such as intersection realignment coupled with speed limit reduction; the installation of traffic lights and/or other signage; and the addition of acceleration, deceleration, and turn lanes on routes with site entrances.	O
158	Monitoring	Ongoing ground transportation planning shall be conducted to evaluate road use, minimize traffic volume, and ensure that roads are maintained adequately to minimize associated impacts.	O
Visual Resources			
159	Design	Visual information shall be included as a part of the critical due diligence information when determining and selecting development sites and ROW boundaries.	S
160	Design	Consider proposed facility and transmission line visual impacts from relevant viewing angles when selecting building sites and locations. Consider visual impacts from frequent water vapor plumes if cooling towers are proposed.	S

Table B-4 *(continued)*
Best Management Practices

No.	Topic	Description of Measure	Phase
161	Design	ROW location, size, and boundary determinations shall consider terrain characteristics and opportunities for full or partial project concealment.	S
162	Design	Other site design elements shall be integrated with the surrounding landscape. Elements to address include minimizing the profile of the ancillary structures, burial of cables, prohibition of commercial symbols, and lighting. Regarding lighting, efforts shall be made to minimize the need for and amount of lighting on ancillary structures.	S
163	Design	Siting shall take advantage of both topography and vegetation as screening devices to restrict views of projects from visually sensitive areas.	S
164	Design	Locating facilities near visually prominent landscape features (e.g., knobs and waterfalls) that naturally draw observers' attention shall be avoided.	S
165	Design	Use commercially available modeling software to identify a "zone" of flicker. Appropriately site and orient wind turbines to minimize shadow flicker occurrences on nearby residences.	S
166	Design	Maintain uniform size and design of turbines (for example, direction of rotation, type of turbine and tower, and height).	S
167	Design	Structures and roads shall be designed and located to minimize and balance cuts and fills. Retaining walls, binwalls, half bridges, and tunnels shall be used to reduce cut and fill.	S
168	Design	Low-profile structures shall be chosen whenever possible to reduce their visibility.	S
169	Design	Openings in vegetation for facilities, structures, roads, and the like shall mimic the size, shape, and characteristics of naturally occurring openings to the extent possible.	S, C
170	Design	Materials and surface treatments shall repeat and/or blend with the existing form, line, color, and texture of the landscape.	S, C
171	Design	Review pre-development visual conditions, inventoried visual quality and integrity shall be reviewed and the visual elements of form, line, color and texture restored to pre-development visual compatibility or to that of the surrounding landscape setting conditions, whichever achieves the greater visual quality and ecologically sound outcome.	S
172	Design	Horizontal and vertical pipeline bending shall be used in place of cut-and-fill activities where feasible.	S, C
173	Construction	All stakes and flagging will be removed from the construction area and disposed of in an approved facility.	C, O, D
174	Surface disturbance	Existing rocks, vegetation, and drainage patterns shall be preserved to the maximum extent possible.	C, O, D

Table B-4 *(continued)*
Best Management Practices

No.	Topic	Description of Measure	Phase
175	Surface disturbance	Brush-beating or mowing, or using protective surface matting rather than vegetation removal shall be done where feasible.	C, O, D
176	Surface disturbance	Slash from vegetation removal shall be mulched and spread to cover fresh soil disturbances as part of the revegetation plan. Slash piles shall not be left in sensitive viewing areas.	C, O, D
177	Surface disturbance	Project developers shall reduce visual impacts during construction by clearly delineating construction boundaries and minimizing areas of surface disturbance; preserving vegetation to the greatest extent possible; utilizing undulating surface disturbance edges; stripping, salvaging, and replacing topsoil; contoured grading; controlling erosion; using dust suppression techniques; and restoring exposed soils to their original contour and vegetation.	C O, D
178	Surface disturbance	Visual impacts are lessened when vegetation and ground disturbances are minimized, siting shall take advantage of existing clearings to reduce vegetation clearing and ground disturbance. Linear development (transmission lines, pipelines, roads, etc.) shall follow the edges of clearings (where they would be less conspicuous) rather than passing through the center of clearings.	S, C, O, D
179	Surface disturbance	Road-cut slopes shall be rounded, and the cut-and-fill pitch shall be varied to reduce contrasts in form and line; the slope shall be varied to preserve specimen trees and nonhazardous rock outcroppings.	C, O, D
180	Surface disturbance	Topsoil from cut-and-fill activities shall be segregated and spread on freshly disturbed areas to reduce color contrast and aid rapid revegetation. Topsoil piles shall not be left in sensitive viewing areas.	C, O, D
181	Surface disturbance	Disposal of excess fill material downslope shall be avoided in order to avoid creating color contrast with existing vegetation and soils.	C, O, D
182	Surface disturbance	Excess cut-and-fill materials shall be hauled in or out to minimize ground disturbance and impacts from fill piles.	C, O, D
183	Surface disturbance	Soil disturbance shall be minimized in areas with highly contrasting subsoil color.	C, O, D
184	Surface treatments	Soil borrow areas, cut-and-fill slopes, berms, water bars, and other disturbed areas shall be contoured to approximate naturally occurring slopes, thereby avoiding form and line contrasts with the existing landscape. Contouring to a rough texture would trap seed and discourage off-road travel, thereby reducing associated visual impacts.	C, O, D
185	Surface treatments	Gravel and other surface treatments shall be removed or buried.	C, O, D
186	Facilities	Minimize the number of structures. Combine and carry out activities in one structure, or co-locate structures to share pads, fences, access roads, lighting, and other facilities.	S, O

Table B-4 *(continued)*
Best Management Practices

No.	Topic	Description of Measure	Phase
187	Facilities	Turbine arrays and turbine design shall be integrated with the surrounding landscape. Design elements to be addressed include visual uniformity, use of tubular towers, proportion and color of turbines, nonreflective paints, and prohibition of commercial messages on turbines.	S
188	Skylining	Visual "skylining" shall be avoided when structures, transmission lines, and other structures are placed on ridgelines, summits, or other locations where they would be silhouetted against the sky from important viewing locations. Skylining draws visual attention to the project elements and can greatly increase visual contrast. Siting shall take advantage of opportunities to use topography as a backdrop for views of facilities and structures to avoid skylining. Evaluate alternatives and select the least visually intrusive option when linear facilities (e.g. transmission lines) cross over ridgelines.	S
189	Lighting	Minimize the need for and amount of lighting on ancillary structures. Design and commit to install permanent exterior lighting such that: • light fixtures do not cause spill light beyond the project site; b) lighting fixtures are fully shielded, do not cause reflected glare, and use low temperature bulbs; • direct lighting does not illuminate the nighttime sky; • illumination of the project and its immediate vicinity is minimized by including use of motion detectors or other lighting controls to turn lights off except when needed for security and safety; • lighting complies with local policies and ordinances; and • use lighting that meets International Dark Sky Association standards, when feasible.	S, C, O, D
190	Color	Paint the turbines with a non-reflective coating and a uniform color while observing air navigational marking regulations and addressing biological resource concerns.	S, C, O
191	Color	Appropriately colored materials shall be selected for structures, or appropriate stains/coatings shall be applied to blend with the project's backdrop.	S
192	Color	Materials, coatings, or paints having little or no reflectivity shall be used whenever possible.	S, O
193	Color	Grouped structures shall all be painted the same color to reduce visual complexity and color contrast.	C, O
194	Color	Aboveground pipelines shall be painted or coated to match their surroundings.	C, O
195	Color	Culvert ends shall be painted or coated to reduce color contrasts with existing landscape.	C, O, D
196	Color	No paint or permanent discoloring agents will be applied to rocks or vegetation to indicate surveyor construction activity limits.	C, O, D
197	Color	Reduce graveled surfaces visual color contrast with approved color treatment practices.	S, C, O, D

Table B-4 *(continued)*
Best Management Practices

No.	Topic	Description of Measure	Phase
198	Glare	Minimize the use of signs and project construction signs; necessary signs shall be made of nonglare materials and utilize unobtrusive colors; reverse sides of signs and mounts shall be painted or coated using the most suitable color selected from the BLM Standard Environmental Color Chart to reduce color contrasts with the existing landscape; however, placement and design of any signs required by safety regulations must conform to these regulations.	S, C, O
199	Transmission	Monopoles may reduce visual impacts more effectively than lattice towers in foreground and middleground views within built or partially built environments, while lattice towers tend to be more appropriate for less developed rural landscapes where the latticework would be more transparent against background textures and colors.	S, O
200	Transmission	All electrical collector lines shall be buried where possible. All electrical collector lines shall be buried in a manner that minimizes additional surface disturbance (e.g., along roads or other paths of surface disturbance).	S, C
201	Transmission	Communication and other local utility cables shall be buried where feasible.	C, O
202	Helicopter use	In visually sensitive areas, air transport capability shall be used to mobilize equipment and materials for clearing, grading, and erecting transmission towers, thereby preserving the natural landscape conditions between tower locations, and reducing the need for permanent and/or temporary access roads.	C, O, D
203	Waste removal	Establish a regular litter pick-up procedure within and around the perimeter of the project site.	C, O, D
204	Waste removal	"Good housekeeping" procedures shall be developed to ensure that the site is kept clean of debris, garbage, fugitive trash or waste, and graffiti; to prohibit scrap heaps and dumps; and to minimize storage yards. Mitigation measures regarding waste management (Section 5.20.3) shall be applied.	C, O, D
205	Maintenance	Maintenance activities shall include dust abatement (in arid environments) and noxious weed control.	O
206	Maintenance	Road maintenance activities shall avoid blading existing forbs and grasses in ditches and adjacent to roads.	O
207	Revegetation	Cut slopes shall be randomly scarified and roughened to reduce texture contrasts with existing landscapes and aid in revegetation.	C, O, D
208	Revegetation	A combination of seeding, planting of nursery stock, transplanting of local vegetation within the proposed disturbance areas, and staging of construction enabling direct transplanting shall be considered. Where feasible, native vegetation shall be used for revegetating, establishing a composition consistent with the form, line, color, and texture of the surrounding undisturbed landscape.	C, O, D

Table B-4 *(continued)*
Best Management Practices

No.	Topic	Description of Measure	Phase
209	Revegetation	Edges of revegetated areas shall be feathered to reduce form and line contrasts with the existing landscapes.	C, O, D
210	Revegetation	Stockpiled topsoil shall be reapplied to disturbed areas and the areas revegetated by using a mix of native species selected for visual compatibility with existing vegetation, where feasible, or a mix of native and non-native species if necessary to ensure successful revegetation.	C, O, D
211	Mitigation	The full range of visual best management practices shall be considered, and plans shall incorporate all pertinent BMPs. Visual resource monitoring and compliance strategies shall be included as a part of the project mitigation plans to cover the construction, operation and decommissioning phases.	C, O, D
212	Mitigation	Visual impact mitigation objectives and activities shall be discussed with equipment operators before construction activities begin.	C, O, D
213	Screening	Where screening topography and vegetation are absent, natural-looking earthwork landforms and vegetative or architectural screening shall be used to minimize visual impacts. Vegetative screening can be particularly effective along roadways.	S, O
214	Reclamation	All areas of disturbed soil shall be reclaimed by using weed-free native grasses, forbs, and shrubs representative of the surrounding and intact native vegetation composition and/or use non-native species, if necessary to ensure successful revegetation.	C, O, D
215	Reclamation	Rocks, brush, and forest debris shall be restored whenever possible to approximate pre-existing visual conditions.	C, O, D
216	Reclamation	Interim restoration shall be undertaken during the operating life of the project as soon as possible after disturbances.	C, O, D
Water Resources			
217	Water supply	Use the minimum volume of water necessary for mirror washing. Collecting and recycling the wash water is encouraged.	O
218	Water supply	Water use shall be minimized by implementing conservation practices, such as treating spent wash water and storing it for reuse.	C, O, D
219	Ground water	The creation of hydrologic conduits between two aquifers shall be avoided during foundation excavation and other activities.	C, O, D
220	Water quality	If drilling activities are required as part of site characterization, any drilling fluids or cuttings shall be maintained so that cuttings, fluids, or runoff from storage areas will not come in contact with aquatic habitats. Temporary impoundments for storing drilling fluids and cuttings shall be lined to minimize infiltration of runoff into groundwater or surface water.	C, O, D

Table B-4 *(continued)*
Best Management Practices

No.	Topic	Description of Measure	Phase
221	Water quality	Washing equipment or vehicles in streams and wetlands shall be avoided.	C, O, D
222	Water quality	Project developers shall avoid or minimize and mitigate the degradation of water quality (e.g., chemical contamination, increased salinity, increased temperature, decreased dissolved oxygen, and increased sediment loads) that could result from construction activities. Water quality in areas adjacent to or downstream of development areas shall be monitored during the life of the project to ensure that water quality is protected.	C, O, D
223	Stormwater	Construction activities shall avoid land disturbance in ephemeral washes and dry lakebeds; any unavoidable disturbance would be minimized. Stormwater facilities would be designed to route flow around the facility and maintain pre-project hydrographs.	C, O, D
224	Stormwater	When stream or wash crossings are constructed, culverts or water conveyances for temporary and permanent roads shall be designed to comply with county standards or to accommodate the runoff of a 100-year storm, whichever is larger.	C, O, D
225	Stormwater	Geotextile mats shall be used to stabilize disturbed channels and stream banks. Earth dikes, swales, and lined ditches shall be used to divert work-site runoff that would otherwise enter a disturbed stream.	C, O, D
226	Stormwater	Special construction techniques shall be used, where applicable, in areas of erodible soil, alluvial fans, and stream channel/wash crossings.	C, O, D
227	Reclamation	All management plans, mitigation measures, and stipulations developed for the construction phase shall be applied to similar activities during the decommissioning/reclamation phase.	D
Wild Horses and Burros			
228	Design	Access roads shall be appropriately constructed, improved, and maintained and should employ appropriate signs to minimize potential horse and burro collisions. Fences should be built (as practicable) to exclude wild horses and burros from all project facilities, including all water sites built for the development of facilities and roadways.	S, C, O, D
Wildfire			
229	Safety	The effectiveness of developing and adhering to a hazardous materials and waste management plan and a fire safety plan, requiring a facility design to include isolation valves to limit HTF releases (where applicable), and providing worker training shall be considered in reducing fire risks.	S

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Appendix D List of Preparers

This EIS was prepared by an interdisciplinary team of staff from the Yuma Field Office and Arizona State Office of the BLM, with assistance from Stantec Consulting Services Inc. (Tables D-1 [BLM] and D-2 [Consultants]).

Table D-1. BLM Staff Contributing to the Preparation of this EIS

Contributor	Responsibilities
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Vanessa Briceño	Lands and Realty, Special Management Areas, Travel and Transportation
Cristina Francois	Biological Resources, Livestock Grazing
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Table D-2. Stantec Consulting Services, Inc. Team Contributing to the Preparation of this EIS

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