

**VOLUME 1**

**FINAL ENVIRONMENTAL IMPACT STATEMENT**

# **Southern Bighorn Solar Projects**

ON BEHALF OF:

**THE MOAPA BAND OF PAIUTE INDIANS**

**BUREAU OF INDIAN AFFAIRS**

**BUREAU OF LAND MANAGEMENT**

**U.S. ENVIRONMENTAL PROTECTION AGENCY**

**U.S. FISH AND WILDLIFE SERVICE**

Estimated Lead Agency Total Costs Associated with  
Developing and Producing this EIS: \$1,845,000.00

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## LIST OF ACRONYMS AND ABBREVIATIONS

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AC	alternating current
ACEC	Area of Critical Environmental Concern
ACSP	Arrow Canyon Solar Project
Aiya	Aiya Solar Project
AF	acre-feet
AFY	acre-feet per year
APE	area of potential effect
APLIC	Avian Power Line Interaction Committee
BESS	battery energy storage system
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BMP	best management practice
CEAA	cumulative effects analysis area
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
cfs	cubic feet per second
CO <sub>2</sub> e	carbon dioxide equivalent
COVID	coronavirus disease
CPV	concentrated photovoltaic
CT	census tract
DC	direct current
DLA	designated leasing area
DOE	Department of Energy
DOI	Department of the Interior
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
ESMSP	Eagle Shadow Mountain Solar Project
FEMA	Federal Emergency Management Agency
FLPMA	Federal Land Policy and Management Act of 1976
gen-tie	transmission generation interconnection
GHG	greenhouse gas
GIS	geographic information system
GPS	global positioning system
HMA	Herd Management Area
HUC	hydrologic unit code
I-15	Interstate 15
IBA	Important Bird Area
IPaC	Information for Planning and Consultation
K Road	K Road Moapa Solar Facility (currently known as Southern Paiute Solar Project)
kV	kilovolt

LWRFS	Lower White River Flow System
MBTA	Migratory Bird Treaty Act
mph	miles per hour
MSEC	Moapa Solar Energy Center
MW	megawatt
MWac	megawatt alternating current
NDOT	Nevada Department of Transportation
NDOW	Nevada Division of Wildlife
NEMA	National Electric Manufacturers Association
NEPA	National Environmental Policy Act
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NOI	Notice of Intent
NTTR	Nevada Test and Training Range
NV	Nevada
O&M	operations and maintenance
OSNHT	Old Spanish National Historic Trail
PV	photovoltaic
ROD	Record of Decision
ROW	right-of-way
SBSP I	Southern Bighorn Solar Project I
SBSP II	Southern Bighorn Solar Project II
SCADA	Supervisory Control and Data Acquisition
SHPO	State Historic Preservation Office
SNWA	Southern Nevada Water Authority
SVP	sensitive viewing platform
SWPPP	Stormwater Pollution Prevention Plan
TCP	traditional cultural property
TNW	traditional navigable water
UNLV	University of Nevada Las Vegas
US 93	U.S. Highway 93
U.S.	United States
USACE	U.S. Army Corps of Engineers
U.S.C.	United States Code
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VAU	visual analysis unit
VRM	Visual Resource Management
WOUS	water of the U.S.



# EXECUTIVE SUMMARY

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The following sections summarize the Final Environmental Impact Statement (EIS) for the Southern Bighorn Solar Project I (SBSP I) and Southern Bighorn Solar Project II (SBSP II). The two projects are collectively referred to as the Projects and/or SBSPs. The Projects consist of two proposed photovoltaic (PV) solar energy facilities with a combined 400-megawatt alternating current (MWac) capacity (300 MWac for SBSP I and 100 MWac for SBSP II) and battery storage located on the Moapa River Indian Reservation (Reservation) approximately 30 miles north of Las Vegas in Clark County, Nevada.

300MS 8me, LLC and 425LM 8me, LLC (Applicants), both subsidiaries of 8minute Solar Energy, have each entered into agreements with the Moapa Band of Paiute Indians (Moapa Band) to lease two adjacent sections of land for up to 50 years on the Reservation for the purposes of constructing, operating and maintaining, and eventual decommissioning of solar PV electricity generation facilities (referred to as the solar fields) and battery energy storage system (BESS). **Figure 1-1** in the Final EIS shows the location of the Projects. The two solar Projects include the solar fields, access roads, collector lines, and connection with an existing transmission generation interconnection (gen-tie) line.

## ES.1 Purpose of the Project

The primary purposes of the proposed SBSPs are to: (1) provide a long-term, viable economic revenue base (lease income) and job opportunities for the Moapa Band; (2) allow the Moapa Band, in partnership with the Applicants, to optimize the use of the lease site while maximizing the potential economic benefit to the Moapa Band; and (3) develop clean renewable electricity generation from the Moapa Band's solar resources to support the State of Nevada's 50 percent renewable portfolio standard requirement by 2030 and a goal of 100 percent carbon-free resources by 2050 (State Bill 358). The Projects would also help meet the federal government's goals to eliminate or reduce greenhouse gas (GHG) emissions and promote the deployment of renewable energy technologies.

The Moapa Band identified the proposed Projects as viable opportunities to meet its economic development goals because the leases would provide much needed revenue to the Moapa Band while occupying a small portion of the Reservation (4.4 percent). The construction, operations and maintenance (O&M), and decommissioning of the Projects would afford employment opportunities to Moapa Band members. The Moapa Band has determined that the Projects would also be consistent with the Moapa Band's tradition of respect for the land and would fulfill the purposes for which the 70,564 acres were restored to the Moapa Band by the federal government in 1980 (Moapa Band 1980). The use of the Moapa Band's water proposed by the Projects would help the Moapa Band affirm and sustain its rights to the water.

## ES.2 Agency Purpose and Need

The need for the BIA action is established by the BIA's responsibility to respond to a request for a business lease approval and right-of-way (ROW) application between the Moapa Band and the Applicants over or across lands held in trust for Indian tribes. The BIA must meet its responsibility to review and approve actions on tribal lands held in trust for the benefit of the Moapa Band (42 United States Code [U.S.C.] §§ 4321 et seq.).

The BIA purpose, pursuant to 25 U.S.C. § 415, is to deny, grant, or grant with modifications the solar energy ground leases for the solar fields and associated ROW agreements between the Moapa Band and the Applicants.

The need for the Bureau of Land Management (BLM) action is established under Title V of the Federal Land Policy and Management Act ([FLPMA] 43 U.S.C. § 1761), where the BLM must respond to Applicants' ROW grant applications for the collector lines, existing BLM-managed access roads, and connection with, access to, and maintenance of the gen-tie line constructed for the previously approved Eagle Shadow Mountain Solar Project (ESMSP). In accordance with Section 103(c) of FLPMA, public lands are to be managed for multiple uses that consider the long-term needs of future generations for renewable and non-renewable resources. The Secretary of the Department of Interior (DOI) is authorized to grant ROWs on public lands for systems of generation, transmission, and distribution of electrical energy (Section 501[a][4]).

The BLM purpose is to deny, grant, or grant with modifications the ROW request to construct, operate, maintain, and decommission the proposed collector lines located within the designated utility corridor on Reservation land managed by the BLM; the ROW request for use of existing access roads located on BLM land and Reservation land within the BLM-managed designated utility corridor; and the ROW request for connection with, access to, and maintenance of the existing gen-tie line constructed for the previously approved ESMSP, located on BLM land and land within the BLM-managed designated utility corridor. The ROWs would be in compliance with FLPMA, BLM ROW regulations (43 Code of Federal Register [CFR] § 2800), and other applicable federal and Nevada State laws and policies, and would be in compliance with all objections, directions, and requirements of the BLM Las Vegas Resource Management Plan.

Because the BIA has a jurisdictional trust responsibility over Indian lands and the BLM has land management responsibilities under FLPMA, the Projects are a major federal action and must comply with the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. §§ 4321 et seq.). Because the majority of the Projects would be located on tribal trust lands, the BIA is the lead federal agency. The Moapa Band, the BLM, U.S. Environmental Protection Agency (EPA), and U.S. Fish and Wildlife Service (USFWS) are cooperating agencies on the EIS for the Projects. The BIA and the BLM will use this EIS to make their respective decisions and the other cooperating agencies will use this information to support their analyses and decisions, as needed.

### **ES.3 Public Involvement**

The BIA published a Notice of Intent (NOI) to prepare an EIS for the Projects in the Federal Register on May 8, 2020 (DOI 2020a). In addition, notices were placed in local newspapers and two virtual public scoping meetings were held for the Projects. In accordance to interim guidance for NEPA public participation processes during the COVID-19 pandemic (DOI 2020b), the public scoping meetings were held virtually rather than in person. Virtual public scoping meetings were held on May 27 and May 28, 2020. Additional project information and a comment form were made available on the project website: <https://southernbighornsolar.com/>. The scoping report (**Appendix A**) provides additional information on the scoping process, summarizes the comments received, and provides a preliminary list of issues and/or concerns identified.

The key issues were identified by interested agencies, stakeholders, and members of the public during scoping for the Projects and include:

- Generation of dust during construction.
- Cumulative impacts of other solar projects in the area, particularly if the construction schedules overlap.
- Soil impacts from grading activities and resulting potential for increased erosion.
- Loss of sensitive soils containing carbon-capturing biocrusts from grading activities.
- Effects of shading, fencing, and use of pesticides (if relevant) on vegetation.
- Potential impacts to rare plants from the potential spread of noxious and invasive weeds.
- Impacts to scenic quality of the landscape.

- Concerns with battery storage areas, particularly if located in drainages or areas subject to flooding.
- Impacts on floodplains and drainages, including surface water and stormwater flows, erosion, and sedimentation in the region that may not be adequately addressed by individual stormwater control plans for each facility. Preventing significant effects to floodplains and drainages may require channel monitoring and adaptive management strategies.
- Road crossings and construction adjacent to washes.
- Increased intensity and severity of stormwater flows and lack of sufficient stormwater infrastructure.
- Impacts to threatened and endangered species (including the Mojave desert tortoise) and other sensitive wildlife species (including the Gila monster), particularly from the long-term effects of habitat fragmentation, restricted gene flow, and the cumulative impacts of other solar projects in the area.
- Impacts to birds from the “lake effect” and destruction of nests, and the need for avian mortality monitoring.

The BIA published a Notice of Availability (NOA) announcing the publication of the Draft EIS for the Proposed Project in the Federal Register on March 12, 2021. In addition, notices were placed in local newspapers and two public meetings were held virtually on April 13 and 14, 2021 to receive comments on the Draft EIS. Comments received on the Draft EIS and how the comments are addressed in this Final EIS are included in **Appendix P**.

## ES.4 Alternatives

This document analyzes the proposed Projects and the No Action Alternative. This document also discusses alternatives that were considered but eliminated from further consideration (see Section 2.3). The proposed Projects are the Proposed Action. The Proposed Action and the No Action alternatives are described in detail in Chapter 2 and are summarized below.

### Proposed Action

The SBSP solar fields would occupy up to 3,600 acres (2,600 acres for SBSP I and 1,000 acres for SBSP II) within a lease option area of approximately 6,355 acres located entirely on the Reservation that would be leased by the Moapa Band to the Applicants for a term of up to 50 years. Major onsite facilities include solar fields with a combined capacity of 400 MWac (300 MWac for SBSP I and 100 MWac for SBSP II) comprised of multiple solar blocks, site fencing, communications systems infrastructure, O&M buildings, and internal access roads.

The offsite facilities would include approximately 10 miles of collector lines (7 miles for SBSP I and 3 miles for SBSP II) that would deliver energy from the inverters within each solar field to each Project’s substation, which would be constructed in the previously approved ESMSP high-voltage area. The collector lines (three sets for SBSP I and one set for SBSP II) would cross through a federally designated utility corridor on the Reservation that is managed by the BLM. Additional offsite facilities include existing access roads (on Reservation land, Reservation land within the BLM-managed designated utility corridor, and BLM land), new access roads on Reservation lands that would be constructed to connect the existing Southern Paiute Solar Project facility roads to the SBSP I and SBSP II solar fields, and a new access road that would be constructed within the proposed collector line ROW on Reservation land within the BLM-managed utility corridor.

Electricity generated by the Projects would flow from the Project substations through an existing transmission gen-tie line constructed as part of the ESMSP, using all existing structures, and connect to the regional electrical grid at NV Energy’s Reid Gardner Substation. This gen-tie line is located within the BLM-managed designated utility corridor on Reservation lands and BLM lands. No additional or new construction on the gen-tie line

(including a maintenance road) would be required for the SBSPs; however, the Applicants would need to obtain a ROW from BLM for access to, connection with, and maintenance of the gen-tie line.

**Table ES-1** and **Table ES-2** summarize the BIA and BLM jurisdiction and agency action required for each project component, respectively.

**Table ES-1. Summary of BIA Jurisdiction for the Southern Bighorn Solar Projects**

Project Component	Location	Agency Action	SBSP I (Miles/Acres) <sup>1</sup>	SBSP II (Miles/Acres) <sup>1</sup>
Solar Fields	Moapa River Indian Reservation	Lease <sup>2</sup>	2,600 acres	1,000 acres
Existing Access Roads <sup>3</sup>	Moapa River Indian Reservation	ROW	4 miles / 10 acres	4 miles / 10 acres
New Access Roads <sup>3</sup>	Moapa River Indian Reservation	ROW	2 miles / 7 acres	2 miles / 5 acres
Collector Lines	Moapa River Indian Reservation	ROW	4 miles / 20 acres	2 miles / 14 acres
<b>Total BIA</b>	-	-	<b>10 miles / 2,637 acres</b>	<b>10 miles / 1,029 acres</b>

<sup>1</sup> Acres and miles are approximate. SBSP I consists of three total collector lines, and SBSP II consists of a single collector line. Collector line acreage is based on a ROW that varies from 60 to 120 feet wide for SBSP I and 50 to 80 feet wide for SBSP II, depending on location.

<sup>2</sup> Lease term would be up to 50 years.

<sup>3</sup> A portion of the access roads would be required for both Projects, and the associated acreage is included in the calculations for both Projects. A total of 10 acres of existing access roads and 8 acres of new access roads would be required for the Projects.

**Table ES-2. Summary of BLM Jurisdiction for the Southern Bighorn Solar Projects**

Project Component	Location	Agency Action <sup>1</sup>	SBSP I (Miles/Acres) <sup>2</sup>	SBSP II (Miles/Acres) <sup>2</sup>
Existing Access Roads <sup>3</sup>	BLM-Managed Designated Utility Corridor	ROW	20 miles / 42 acres	20 miles / 42 acres
Existing Access Roads <sup>3</sup>	BLM Lands	ROW	2 miles / 6 acres	2 miles / 6 acres
Collector Lines	BLM-Managed Designated Utility Corridor	ROW	3 miles / 13 acres	< 1 mile / 7 acres
Gen-tie line <sup>4</sup>	BLM-Managed Designated Utility Corridor	ROW	11 miles / 98 acres	11 miles / 98 acres
Gen-tie line <sup>4</sup>	BLM Lands	ROW	< 1 mile / 3 acres	< 1 mile / 3 acres
<b>Total BLM</b>	-	-	<b>36 miles / 162 acres</b>	<b>34 miles / 156 acres</b>

<sup>1</sup> BLM ROW term would be 50 years.

<sup>2</sup> Acres and miles are approximate. Collector line acreage is based on a ROW that varies from 60 to 120 feet wide for SBSP I and 50 to 80 feet wide for SBSP II, depending on location.

<sup>3</sup> The existing access roads would be required for both Projects, and the associated acreage is included for both Projects.

<sup>4</sup> The gen-tie line was constructed as part of the previously approved ESMSP. Gen-tie line construction is not included in SBSPs. The Applicants would each need to obtain ROW from BLM for access to, connection with, and maintenance of the same section of gen-tie.

## No Action Alternative

Under NEPA, the BIA and cooperating agencies must consider an alternative that assesses the impacts that would occur if the Projects were not constructed. The No Action Alternative assumes that the lease agreements would be denied, the BLM ROWs would not be issued, and the Projects would not be built. Under the No Action Alternative, the purpose and need of the Projects would not be met. The Moapa Band would not benefit economically from the energy production that would be obtained from the solar Projects. The development of sustainable renewable resources would not occur, and the State of Nevada would not be assisted in efforts to meet its renewable energy goals.

## ES.5 Environmental Consequences

The Projects would be the fifth and sixth utility-scale PV solar projects to undergo evaluation on the Reservation (**Figure 1-3**). Of the previous evaluated projects, one is in operation while another is currently under construction. Below are brief summaries of the referenced projects:

- **K-Road Moapa Solar Facility (K-Road)** – 350 MW PV solar project, Final EIS and Record of Decision (ROD) published in 2012 (BIA 2012a). Constructed and currently in operation. Located between, and adjacent to, the lease option areas for the proposed SBSP I and SBSP II.
- **Aiya Solar Project (Aiya)** – 100 MW PV solar project, Final EIS and ROD published in 2016 (BIA 2016). Aiya has no power purchaser and has not been constructed. If constructed, it would be in the northern portion of the Reservation, approximately 9 miles from the proposed Projects
- **Eagle Shadow Mountain Solar Project (ESMSP)** – 300 MW PV solar project, Final EIS published in 2019 and ROD signed in February 2020 (BIA 2019a, 2020d). Currently under construction and located just west of the proposed Projects.
- **Moapa Solar Energy Center (MSEC)** – 200 MW PV solar project, MSEC Final EIS and ROD were published in 2014 (BIA 2014). In March 2017, the MSEC Project was sold and renamed the Arrow Canyon Solar Project (ACSP). This project was evaluated in a Supplemental EIS for the expansion of the solar field on Reservation lands (BIA 2020c). Located west and southwest of the proposed Projects.

**Figure 1-3** shows the relative locations of these projects. While the solar fields and collector lines associated with the proposed SBSPs would occupy a different footprint than the previously evaluated PV solar projects on the Reservation, the size of the previously analyzed facilities, location, and many of the resources/uses evaluated would be similar to the SBSPs. Analyses from the previous resource investigations are incorporated by reference in this EIS, where applicable. The Final EISs for these four previous projects can be found at the following link: <https://southernbighornsolar.com/previous-eis/>.

Referencing allows the BIA to prepare environmental documents without duplicating relevant portions of the previous EISs and RODs. Since potential impacts to resources/uses from construction, O&M, and decommissioning of these previous solar energy generating facilities have been analyzed in previous NEPA documents, the analysis of the relevant resources/uses will not be repeated in this EIS. **Table 3-1** in Chapter 3 identifies all the resources/uses considered by the BIA and cooperating agencies and describes which resources are evaluated in detail in subsequent sections of this EIS and provides the rationale for eliminating some resources/uses from further analysis.

**Table ES-3** provides a side-by-side comparison summary of the environmental impacts resulting from constructing, operating, maintaining, and decommissioning the SBSPs and the No Action Alternative. This table summarizes the impacts on the resources evaluated in detail in Chapter 3 and those resources from **Table 3-1** with minor impacts.

**Table ES-3. Comparison of Alternatives**

Resource	Proposed Action	No Action Alternative
Cultural Resources	<p>There are no recommended eligible sites within the direct area of potential effects (APE), and therefore, there would be no direct effects on cultural resources. The SBSPs will have an indirect effect on two properties eligible for listing in the NRHP; therefore, the Proposed Action would result in an adverse indirect effect. Adverse effects to one site have been mitigated through implementation of a Memorandum of Agreements (MOA) that was developed for a previous adjacent project, and adverse effects for the other site will be mitigated through implementation of another MOA (<b>Appendix O</b>).</p> <p>See Section 3.2 for additional information on cultural resources.</p>	No direct, indirect, or cumulative impacts.
Invasive Plant Species and Noxious Weeds	<p>Minor, short-term, direct and indirect, adverse impacts from introduction and spread of invasive plant species and noxious weeds during construction. Impacts would be minimized by implementation of an Integrated Weed Management Plan which includes control of established weed species and measures to minimize the spread of weeds.</p> <p>See Table 3-1 for additional information on invasive plant species and noxious weeds.</p>	No direct, indirect, or cumulative impacts.
Migratory Birds	<p>Negligible, localized, short- and long-term, direct and indirect, adverse impacts from disturbance caused by increased human presence, potential collisions with solar panels and collector lines, temporary loss of 2,871 acres (2,141 acres for SBSP I and 731 acres for SBSP II) of habitat, and permanent loss of 794 acres (501 acres for SBSP I and 297 acres for SBSP II) of habitat.</p> <p>See Section 3.3 for additional information on migratory birds.</p>	No direct, indirect, or cumulative impacts.
Socioeconomics	<p>Short- and long-term, direct and indirect, beneficial impacts on socioeconomics from the increase in employment, income, expenditures, and tribal and public revenues. Effects would be greatest during the construction and decommissioning phases due to the size of the workforce required. Although long-term benefits to employment and income would be less during O&amp;M, the lease revenue generated by the Projects would have a long-term, beneficial effect on tribal revenue. The beneficial effects to socioeconomics on the Reservation would be major, while the beneficial effects on the regional economy would be negligible.</p> <p>See Section 3.4 for additional information on socioeconomics.</p>	Moderate adverse effect on socioeconomics for the Moapa Band because there would be no increase in employment and income on the Reservation or in Clark County, and no additional tax revenues would be generated.
Soils	<p>Minor, localized, short- and long-term, adverse effects due to increased soil erosion on the 794 acres (501 acres for SBSP I and 297 acres for SBSP II) that would be permanently disturbed and from potential changes in stormwater flows.</p> <p>See Table 3-1 for additional information on soils.</p>	No direct, indirect, or cumulative impacts.

Executive Summary

Resource	Proposed Action	No Action Alternative
Threatened and Endangered Species	<p>No direct impacts on Moapa dace due to the lack of suitable habitat in the Project area; minor, regional, short- and long-term, indirect, adverse impacts on the Moapa dace from groundwater withdrawals.</p> <p>Moderate, localized, short-term, direct and indirect, adverse impacts on Mojave desert tortoise during construction and decommissioning due to harm, harassment, injury, and possible death to tortoise from ground-disturbing activities and tortoise translocation.</p> <p>Minor, localized, long-term, direct and indirect, adverse impacts on Mojave desert tortoise during O&amp;M due to permanent disturbance of 794 acres (501 acres for SBSP I and 297 acres for SBSP II) of suitable habitat for Mojave desert tortoise.</p> <p>Negligible, localized, short- and long-term, direct and indirect, adverse impacts on southwestern willow flycatcher, yellow-billed cuckoo, and Yuma Ridgway's rail due to the low numbers of these three species that occur in the vicinity of the Projects and the lack of suitable habitat.</p> <p>See Section 3.5 for additional information on threatened and endangered species, <b>Appendix M</b> for the Biological Assessments, and <b>Appendix N</b> for the Biological Opinions.</p>	No direct, indirect, or cumulative impacts.
Traffic / Transportation	<p>Minor, short-term, adverse impacts during construction and decommissioning from workers commuting to and from the work site and the delivery of equipment and materials, which would temporarily increase the volume of traffic on access roads.</p> <p>Negligible, localized, long-term, adverse impacts due to the small number of O&amp;M personnel associated with the Projects (5 full-time equivalent for each project).</p> <p>See Table 3-1 for additional information on traffic and transportation.</p>	No direct, indirect, or cumulative impacts.
Vegetation	<p>Minor, localized, short- and long-term, direct, adverse impacts from temporary loss of approximately 2,871 acres (2,141 acres for SBSP I and 731 acres for SBSP II) of vegetation and the permanent loss of 794 acres (501 acres for SBSP I and 297 acres for SBSP II) of vegetation. Minor, localized, short- and long-term, indirect, adverse impacts on vegetation from shifts in the composition of vegetation communities due to vegetation management practices, increased water inputs, fugitive dust, and the potential introduction or spread of invasive plant species and noxious weeds.</p> <p>See Section 3.6 for additional information on vegetation.</p>	Negligible, localized, long-term, indirect, adverse impacts because the Integrated Weed Management Plan would not be implemented; invasive plant species and noxious weeds would be managed in accordance with existing practices; and there would be less potential for the introduction and spread of invasive plant species and noxious weeds. Negligible, localized, long-term, indirect, beneficial impacts because composition of vegetation communities in the Project area would not shift as a result of Project activities.

Executive Summary

Resource	Proposed Action	No Action Alternative
Visual Resources	<p>Minor to moderate, short-term impacts during construction and decommissioning based on the viewing distance, type of activity taking place, and time of day. Moderate, long-term, localized, adverse impacts and minor, regional, adverse impacts during O&amp;M because the landscape would appear to be substantially altered and would begin to dominate the visual setting of the visual resource study area.</p> <p>See Section 3.7 for additional information on visual resources.</p>	No direct, indirect, or cumulative impacts.
Water Resources	<p>Minor, regional, short- and long-term, direct and indirect, adverse impacts because of potential contamination of surface and groundwater due to leaks and spills of hazardous materials, increased soil erosion and sediment loads during storm events, and altered stormwater flows within floodplains. The withdrawal of groundwater for the Projects would not impact the availability of groundwater in the region.</p> <p>See Table 3-1 for additional information on water resources.</p>	No direct, indirect, or cumulative impacts.

*Note:* The temporary disturbance estimates for each Project do not add up to the total for both Projects due to rounding errors. The permanent disturbance estimates for each Project do not add up to the total for both Projects because they each include 4.0 acres of new access roads that would be shared by both Projects.



# CHAPTER 1 PURPOSE AND NEED

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## 1.1 Introduction

300MS 8me, LLC and 425LM 8me, LLC (Applicants), both subsidiaries of 8minute Solar Energy, have each entered into agreements with the Moapa Band of Paiute Indians (Moapa Band) to lease two adjacent sections of land for up to 50 years on the Moapa River Indian Reservation (Reservation) for the purposes of constructing, operating and maintaining, and eventual decommissioning of solar photovoltaic (PV) electricity generation facilities (referred to as the solar fields) and battery energy storage system (BESS). The two solar projects include the solar fields, access roads, and collector lines and are referred to as the Southern Bighorn Solar Project I (SBSP I) and Southern Bighorn Solar Project II (SBSP II). The two projects are collectively referred to as the Projects and/or SBSPs. **Figure 1-1** shows the general location of the Project area, which includes the solar fields and all onsite and offsite facilities (see Section 2.1 for a detailed description of onsite and offsite facilities).

The Moapa Band is federally recognized and has a Constitution that was approved by the Secretary of the Interior on April 17, 1942. The current total land base of the Reservation is 71,746 acres that are held in trust by the U.S. Government for the sole benefit of the Moapa Band. The Reservation lands originally set aside in 1874 consisted of 2 million acres, but in 1876, the Reservation was reduced to 1,000 acres. In December 1980, Congress added approximately 70,564 acres to the Tribal land base. The stated purpose of the restoration of these Tribal lands was to provide economic development opportunities. A solar project on the Reservation provides a viable economic development opportunity for the Moapa Band.

## 1.2 Project Background, Overview, and Location

The Projects would generate a combined capacity of up to 400 megawatts alternating current (MWac) of electricity: 300 MWac for the SBSP I and 100 MWac for the SBSP II. The solar fields would be constructed on up to approximately 2,600 acres for SBSP I and 1,000 acres for SBSP II (3,600 acres combined) within a lease option area of approximately 6,355 acres of tribal trust land within the Reservation (**Figure 1-2**). The solar fields and all onsite facilities would be constructed within the fencelines shown in **Figure 1-2**. The Projects would be located approximately 30 miles northeast of Las Vegas in Clark County, Nevada, west of Interstate 15 (I-15) and east of U.S. Highway 93 (US 93). The Projects would be located in Township 16 South, Range 64 East that includes all or parts of Sections 12–14, 22–27, and 33–36; Township 16 South, Range 65 East, Sections 4–9, 16–18, 30, and 31; and Township 17 South, Range 64 East, Sections 10–12, Mount Diablo Baseline and Meridian, Nevada. The lease option area was set aside by the Moapa Band exclusively for the Projects. The infrastructure for the Projects would include approximately 10 miles of electric collector lines (7 miles for SBSP I and 3 miles for SBSP II) that would connect the Projects to a substation for each Project within the boundaries of the previously approved Eagle Shadow Mountain Solar Project ([ESMSP] see **Figure 1-2**). From there, the electricity generated would connect to the existing 230-kilovolt (kV) transmission generation interconnection (gen-tie) line within a designated utility corridor which would deliver the electricity to the regional grid at NV Energy’s Reid Gardner Substation.

The right-of-way (ROW) for the collector lines would include approximately 20 acres of land within a federally designated utility corridor on Reservation land that is managed by the Bureau of Land Management (BLM). In addition, the Projects will require ROW for access roads. The Projects include approximately 66 acres of access roads: 18 acres on Reservation land, 42 acres on Reservation land within the BLM-managed designated utility corridor, and 6 acres on BLM land. Most (58 acres) of the access roads are existing roads, including the 6 acres on BLM land.

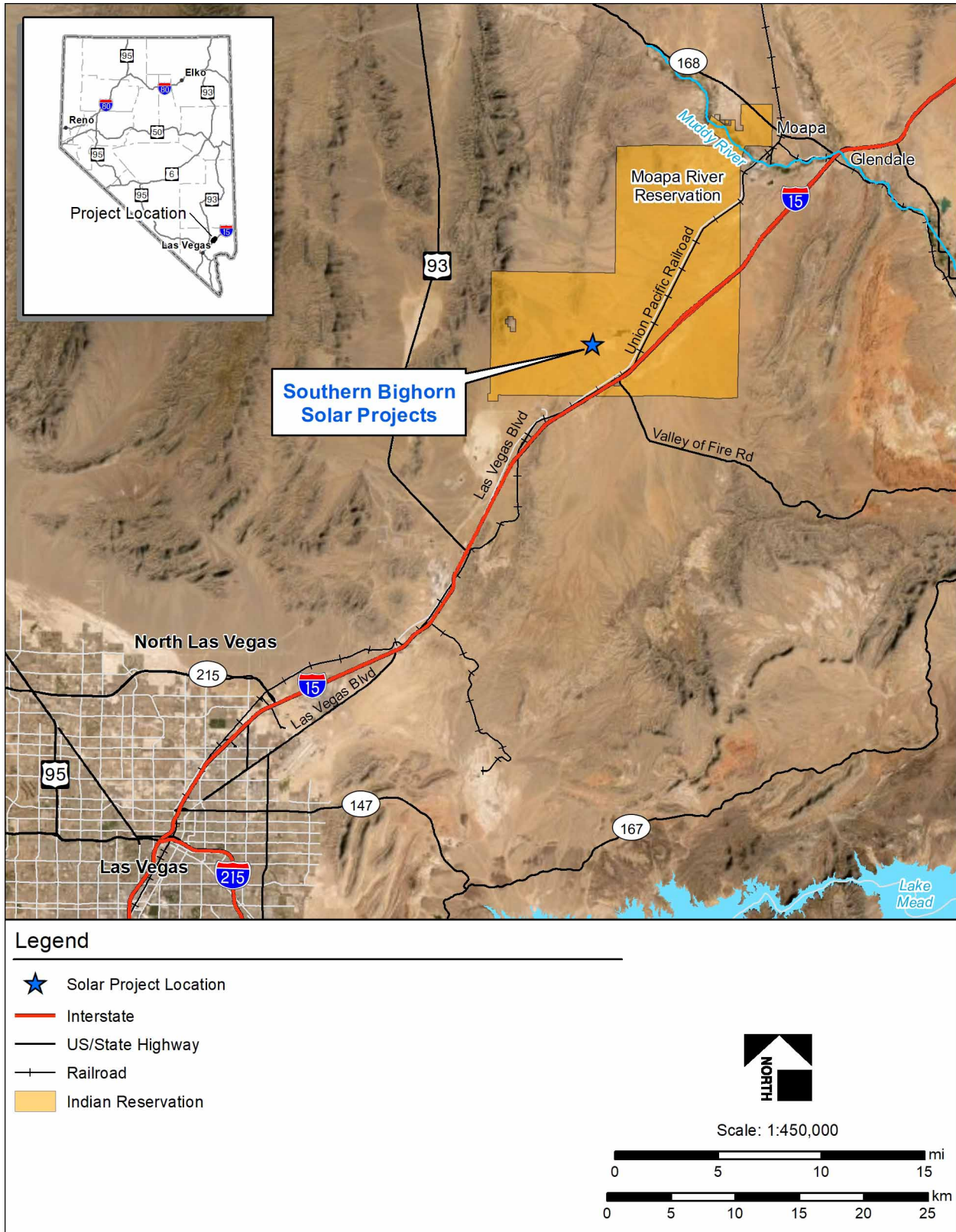


Figure 1-1. Location of Projects

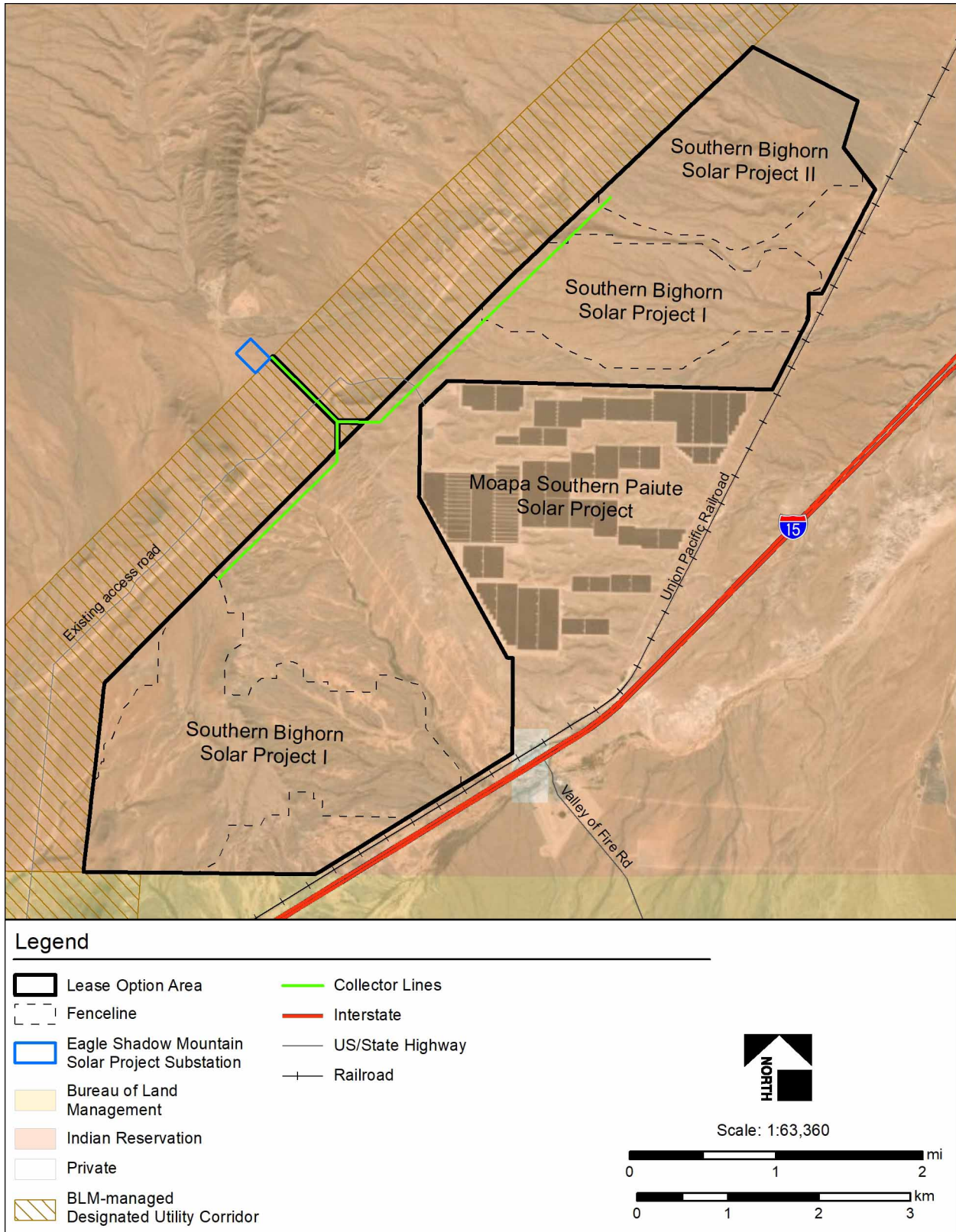


Figure 1-2. Southern Bighorn Solar Projects

The water supply required for the Projects would be leased from the Moapa Band and drawn from the Moapa Band's existing water rights. The Projects are described in more detail in Chapter 2.

The Reservation was selected as the proposed location for the Projects due to its abundance of solar resources, the availability of suitable land, transmission line accessibility, and absence of land use constraints and restrictive land use designations. The lease option area on the Reservation was selected by the Moapa Band to minimize environmental impacts and infrastructure needs due to its proximity to other existing solar projects and infrastructure. In addition, the Projects would create employment opportunities and generate lease income for the Moapa Band, help the State of Nevada meet its renewable energy goals, and contribute to the local economy and encourage expenditures in local businesses.

The Projects would be the fifth and sixth utility-scale PV solar projects to undergo evaluation on the Reservation (**Figure 1-3**). Of the previous evaluated projects, one is in operation while another is currently under construction. Below are brief summaries of the referenced projects.

**K Road Moapa Solar Facility (K Road)/Southern Paiute Solar Project** – K Road Final Environmental Impact Statement (EIS) and Record of Decision (ROD) was published in 2012 and is a 350 MW PV solar project (BIA 2012a). K Road was sold after the completion of the Final EIS and ROD and the site was renamed the Southern Paiute Solar Project. The Southern Paiute Solar Project has been constructed and is currently in operation. The Southern Paiute Solar Project is located between, and adjacent to, the lease option areas for the proposed SBSP I and SBSP II.

**Aiya Solar Project (Aiya)** – Aiya Final EIS and ROD was published in 2016 and is a 100 MW PV solar project (BIA 2016). Aiya has no power purchaser and has not been constructed. If constructed, it would be in the northern portion of the Reservation, approximately 9 miles from the proposed Projects.

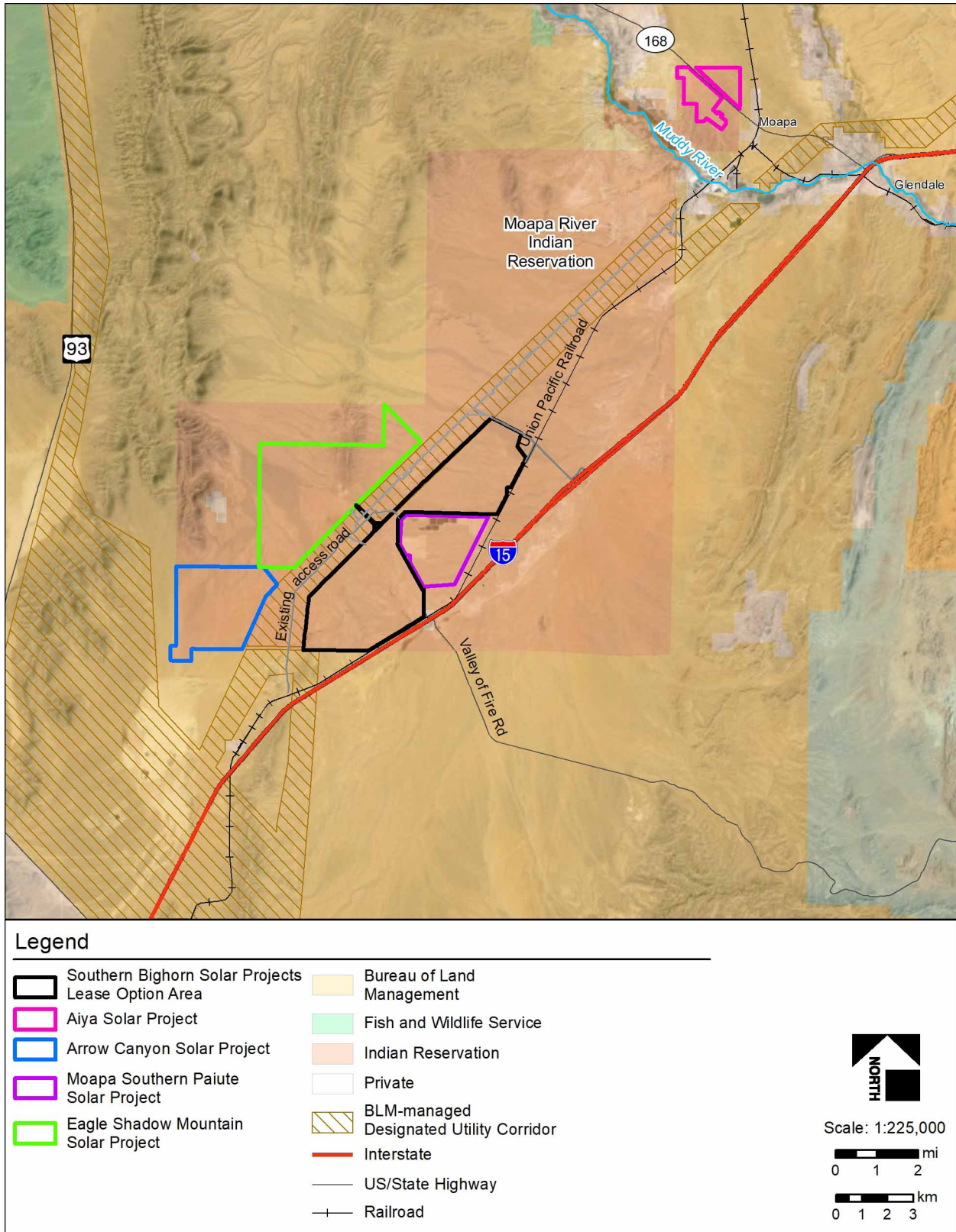
**Eagle Shadow Mountain Solar Project (ESMSP)** – The ESMSP Final EIS was published in December 2019 and the ROD was signed in February 2020 and is a 300 MW PV solar project (BIA 2019a, 2020d). The ESMSP is currently under construction and is located just west of the proposed Projects.

**Moapa Solar Energy Center (MSEC)** – MSEC Final EIS and ROD was published in 2014 and is a 200 MW PV solar project (BIA 2014). In March 2017, the MSEC Project was sold and renamed the Arrow Canyon Solar Project (ACSP). This project was evaluated in a Supplemental EIS for the expansion of the solar field on Reservation lands (BIA 2020c). The ACSP is located west and southwest of the proposed Projects.

In addition, the approved Gemini Solar Project is adjacent to the southern boundary of the Reservation on BLM land and is not yet constructed.

### **1.3 Purpose and Need of the Proposed Project**

The purpose and need of the proposed Projects are to: (1) provide a long-term, viable economic revenue base (lease income) and job opportunities for the Moapa Band; (2) allow the Moapa Band, in partnership with the Applicants, to optimize the use of the lease site while maximizing the potential economic benefit to the Moapa Band; and (3) develop clean renewable electricity generation from the Moapa Band's solar resources to support the State of Nevada's 50 percent renewable portfolio standard requirement by 2030 and a goal of 100 percent carbon-free resources by 2050 (State Bill 358). The Projects would also help meet the federal government's goals to eliminate or reduce greenhouse gas (GHG) emissions and promote the deployment of renewable energy technologies.



**Figure 1-3. Solar Projects on the Moapa River Indian Reservation**

The Moapa Band identified the proposed Projects as viable opportunities to meet its economic development goals because the leases would provide much needed revenue to the Moapa Band while occupying a small portion of the Reservation (4.4 percent). The construction, operations and maintenance (O&M), and decommissioning of the Projects would afford employment opportunities to Moapa Band members. The Moapa Band has determined that the Projects would also be consistent with the Moapa Band's tradition of respect for the land and would fulfill the purposes for which the 70,564 acres were restored to the Moapa Band by the federal government in 1980 (Moapa Band 1980). The use of the Moapa Band's water proposed by the Projects would help the Moapa Band affirm and sustain its rights to the water.

Because the Projects meet the Moapa Band's objectives, they have forwarded a resolution documenting their intent to enter into two lease agreements for the Projects to the BIA to initiate the environmental review process for the proposed combined 400 MW Projects.

## 1.4 Agency Purpose and Need

### 1.4.1 BIA Purpose and Need

The need for the BIA action is established by the BIA's responsibility to respond to a request for a business lease approval and ROW applications between the Moapa Band and the Applicants over or across lands held in trust for Indian tribes. The BIA must meet its responsibility to review and approve actions on tribal lands held in trust for the benefit of the Moapa Band (42 United States Code [U.S.C.] §§ 4321 et seq).

The BIA purpose, pursuant to 25 U.S.C. § 415, is to deny, grant, or grant with modifications the solar energy ground leases for the solar fields and associated ROW agreements between the Moapa Band and the Applicants.

### 1.4.2 BLM Purpose and Need

The need for the BLM action is established under Title V of the Federal Land Policy and Management Act ([FLPMA] 43 U.S.C. § 1761), where the BLM must respond to Applicants' ROW grant applications for the collector lines, existing BLM-managed access roads, and connection with access to, and maintenance of the gen-tie line constructed for the previously approved ESMSP. In accordance with Section 103(c) of FLPMA, public lands are to be managed for multiple uses that consider the long-term needs of future generations for renewable and non-renewable resources. The Secretary of the Department of Interior (DOI) is authorized to grant ROWs on public lands for systems of generation, transmission, and distribution of electrical energy (Section 501[a][4]).

The BLM purpose is to deny, grant, or grant with modifications the ROW request to construct, operate, maintain, and decommission the proposed collector lines located within the designated utility corridor on Reservation land managed by the BLM; the ROW request for use of existing access roads located on BLM land and Reservation land within the BLM-managed designated utility corridor; and the ROW request for connection with, access to, and maintenance of the existing gen-tie line constructed for the previously approved ESMSP, located on BLM land and within the BLM-managed designated utility corridor. The ROWs would be in compliance with FLPMA, BLM ROW regulations (43 Code of Federal Register [CFR] § 2800), and other applicable federal and Nevada State laws and policies, and would be in compliance with all objectives, directions, and requirements of the BLM Las Vegas Resource Management Plan.

## 1.5 Decision To Be Made

**Table 1-1** summarizes the agency decisions to be made for the proposed Projects. The BIA and the BLM decisions, if approved, would assist in addressing the management objectives in Title II, Section 211 of the

Energy Policy Act of 2005 (42 U.S.C. §§ 13201 et seq.) and Secretarial Order 3285A1 (March 11, 2009) that established the development of environmentally responsible renewable energy as a priority for the DOI. Refer to **Figure 2-1** through **Figure 2-3** in Section 2.1 which depicts the components for each Project and the locations where lease would be required from BIA and where ROW would be required from BLM and BIA.

**Table 1-1. Summary of Agency Decisions to be Made**

Agency	Action
BIA	Approval of solar energy ground lease and approval of ROWs for portions of the collector line and access roads located on the Reservation.
BLM	Approval of ROW for portions of the collector lines within the BLM-managed designated utility corridor on Reservation land; and approval of ROW for existing access roads and gen-tie ROW located on BLM land and within the BLM-managed designated utility corridor on Reservation land.
Moapa Band	Approval of the solar leases and consent to ROWs for the collector line and access roads located on the Reservation.

Because the BIA has a jurisdictional trust responsibility over Indian lands and the BLM has land management responsibilities under FLPMA, the Projects are a major federal action and must comply with the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. §§ 4321 et seq.). Because the majority of the Projects would be located on tribal trust land, the BIA is the lead federal agency. The Moapa Band, the BLM, U.S. Environmental Protection Agency (EPA), and U.S. Fish and Wildlife Service (USFWS) are cooperating agencies on the EIS for the Projects. The BIA and the BLM will use this EIS to make their respective decisions and the other cooperating agencies will use this information to support their analyses and decisions, as needed.

## 1.6 Summary of Public Scoping and Issue Identification

### 1.6.1 Public Scoping Process

Scoping helps determine the significant issues, alternatives, and the appropriate scope of environmental analysis to be addressed in this EIS. Scoping also ensures that the issues and alternatives are within the scope of the decisions to be made by the BIA, the BLM, and other cooperating agencies.

The BIA published a Notice of Intent (NOI) to prepare an EIS for the Projects in the Federal Register on May 8, 2020 (DOI 2020a). In addition, notices were placed in local newspapers and two virtual public scoping meetings were held for the Projects. In accordance to interim guidance for NEPA public participation processes during the COVID-19 pandemic (DOI 2020b), the public scoping meetings were held virtually rather than in person. Virtual public scoping meetings were held on May 27 and May 28, 2020. The PowerPoint presentation was posted to the Projects' website prior to the virtual meetings. Participants with access to the internet were able to watch a live presentation of the PowerPoint, ask questions about the Projects, and provide comments through a link on the website. A telephone line was set up for participants who did not have access to the internet. Additionally, the live presentation was recorded and made accessible for viewing throughout the scoping period. The scoping report (**Appendix A**) summarizes the comments received and provides a preliminary list of issues and/or concerns identified.

**Table 1-2** provides a summary of the key issues identified by interested agencies, stakeholders, and members of the public during scoping for the Projects. These issues are the focus of the EIS analysis.

**Table 1-2. Key Issues Identified During Scoping**

Issue topic	Issue/Comment
Air Quality/Public Health	Concerns with the generation of dust during construction.
Cumulative Impacts	Concerns with the cumulative impacts of other solar projects in the area, particularly if the construction schedules overlap.
Socioeconomics	The Moapa Band expressed support regarding the generation of lease income and the creation of high-quality jobs for Moapa Band members.
Soils	Concerns with soil impacts from grading activities and resulting potential for increased erosion. Concerns with loss of sensitive soils containing carbon-capturing biocrusts from grading activities.
Vegetation	Concerns with the effects of shading, fencing, and use of pesticides (if relevant) on vegetation. Concerns with potential impacts to rare plants from the potential spread of noxious and invasive weeds.
Visual Resources	Concerns with impacts to scenic quality of the landscape.
Waste, Hazardous or Solid	Concerns with battery storage areas, particularly if located in drainages or areas subject to flooding.
Water Resources	Concerns regarding impacts on floodplains and drainages, including surface water and stormwater flows, erosion, and sedimentation in the region that may not be adequately addressed by individual stormwater control plans for each facility. Preventing significant effects to floodplains and drainages may require channel monitoring and adaptive management strategies. Concerns with road crossings and construction adjacent to washes. Concerns with increased intensity and severity of stormwater flows and lack of sufficient stormwater infrastructure.
Wildlife	Concerns with impacts to threatened and endangered species (including the Mojave Desert tortoise) and other sensitive wildlife species (including the Gila monster), particularly from the long-term effects of habitat fragmentation, restricted gene flow, and the cumulative impacts of other solar projects in the area. Concerns with impacts to birds from the “lake effect” and destruction of nests, and the need for avian mortality monitoring.

### 1.6.2 Comments on the Draft EIS

The BIA published a Notice of Availability (NOA) announcing the publication of the Draft EIS for the Proposed Project in the Federal Register on March 12, 2021. In addition, notices were placed in local newspapers and two public meetings were held to receive comments on the Draft EIS. Both meetings were held virtually in accordance to interim guidance for NEPA public participation during the COVID-19 pandemic (DOI 2020b). The virtual public meetings were held on April 13 and 14, 2021. Similar to the public scoping meetings, the PowerPoint presentation was posted to the Projects’ website prior to the virtual meetings. Participants with access to the internet were able to watch a live presentation of the PowerPoint, ask questions about the



Projects, and provide comments through a link on the website. A telephone line was set up for participants who did not have access to the internet. Additionally, the live presentation was recorded and made accessible for viewing throughout the public comment period, which ended on April 26, 2021. Comments received on the Draft EIS and how the comments are addressed in this Final EIS are included in **Appendix P**.

## 1.7 Policies and Programs

### 1.7.1 Relationships to Statutes, Regulations, and Other Plans

The SBSPs will conform to the federal, tribal, State, and local laws, regulations, or policies that may apply to the Projects. It should be noted that portions of the Projects that lie wholly within the Reservation would also be regulated under the Moapa Band’s Environmental Policy Ordinance, in accordance with NEPA, and in compliance with other federal regulations that apply on tribal lands (State, County, and local laws and policies are not applicable to tribal lands). Furthermore, the collector lines and access roads on BLM-managed land may be regulated under County, State, and federal regulations that apply to the BLM.

## 1.8 Permits and Approvals Required for the Proposed Projects

**Table 1-3** lists the anticipated federal, tribal, State, and local permits or approvals that may be required for the proposed Projects beyond the BIA and BLM decisions and NEPA process. This table has been subdivided by the components of the Projects and land jurisdiction (the Reservation, and lands managed by the BLM). In addition to the items listed in **Table 1-3**, the access roads will require ROW grants from BIA and BLM.

**Table 1-3. Anticipated Permits and Approvals for the Project Components**

Land Ownership / Jurisdiction	Solar Field	Collector Lines
Moapa River Indian Reservation/BIA	<ul style="list-style-type: none"> <li>Lease approval, ROW grant (BIA)</li> <li>Section 7 consultation (USFWS)</li> <li>Section 106 consultation (SHPO)</li> <li>Compliance with Tribal Environmental Policy Ordinance</li> </ul>	<ul style="list-style-type: none"> <li>ROW grant (BIA)</li> <li>Section 7 consultation (USFWS)</li> <li>Section 106 consultation (SHPO)</li> <li>Compliance with Tribal Environmental Policy Ordinance</li> </ul>
BLM	Not applicable	<ul style="list-style-type: none"> <li>ROW grant (BLM)</li> <li>Section 7 consultation (USFWS)</li> <li>Section 106 consultation (SHPO)</li> <li>Special Purpose Permit—Desert Tortoise Relocation (NDOW)</li> </ul>

*Table Abbreviations:* BIA = Bureau of Indian Affairs; NDOW = Nevada Division of Wildlife; ROW = right-of-way; SHPO = State Historic Preservation Office; USFWS = U.S. Fish and Wildlife Service

# CHAPTER 2 PROPOSED ACTION AND ALTERNATIVES

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This section describes the Proposed Action and identifies potential alternatives to the Projects that were initially identified by the BIA, cooperating agencies, and the Applicants. Alternatives identified by these entities and those suggested by the public or developed to respond to issues identified during the scoping process were evaluated for feasibility. Potential alternatives are categorized as those that are carried forward for detailed analysis and those that were considered but not carried forward for detailed analysis.

## 2.1 Proposed Action Alternative

The Proposed Action includes two solar Projects, referred to as SBSP I and SBSP II. Each Project would be covered under a separate lease, and together, would have a combined capacity of up to 400 MWac—300 MWac for SBSP I and 100 MWac for SBSP II. The solar fields would occupy up to 3,600 acres (2,600 acres for SBSP I and 1,000 acres for SBSP II) within a lease option area of approximately 6,355 acres (**Table 2-1**). The land for the solar fields would be leased to the Applicants for a term of up to 50 years.

Collector lines would connect the solar fields with two new substations constructed within the existing high-voltage area established for the previously approved ESMSP, crossing through the BLM-managed designated utility corridor. From there, the electricity generated would connect through a gen-tie line that was previously constructed as part of the ESMSP, using all existing structures, and connect to the regional electrical grid at NV Energy's Reid Gardner Substation. This gen-tie line is located within the BLM-managed designated utility corridor on Reservation lands and BLM lands. No additional or new construction on the gen-tie line (including a maintenance road) would be required for the SBSPs; however, the Applicants would need to obtain a ROW from BLM for access to, connection with, and maintenance of the gen-tie line (**Table 2-2**). Refer to **Figure 2-1** through **Figure 2-3** which depicts the components for each Project and the locations where lease would be required from BIA and where ROW would be required from BLM and BIA.

The total acreage of temporary and permanent disturbance associated with each of the Projects is summarized in **Table 2-3**. Temporary and permanent disturbance would be required on the Reservation and on the Reservation within the BLM-managed designated utility corridor. No temporary or permanent disturbance would be required on BLM land. The solar fields contain several major facilities, referred to in this document as onsite facilities. Onsite facilities would only impact a portion of up to 3,600-acre solar fields (2,600 acres for SBSP I and 1,000 acres for SBSP II). Onsite facilities are discussed in detail in Section 2.1.1. The BESS, collector lines, and access roads, referred to in this document as offsite facilities, are discussed in detail in Section 2.1.2.

The Projects would implement design features and best management practices (BMPs) to guide design, construction, O&M, and decommissioning to minimize environmental impacts. The design features and BMPs incorporated into the Projects are provided in **Appendix B**. The Applicant-proposed and agency-required mitigation measures will become conditions of the lease agreements for the Projects. The Applicants have the responsibility to comply with the terms of the leases, and the BIA has the authority to enforce the terms and conditions of the leases as outlined in the leasing regulations (25 CFR § 162.466) detailing the process for dealing with non-compliance.

Permanent disturbance areas will be those areas where the surface of the ground is not restored to its existing condition after construction, such as those relating to foundations or new access roads. Temporary disturbance

areas include those where construction activity will take place but where restoration of the surface will be possible, such as those relating to temporary work areas, pull sites, solar fields, and laydown yards.

**Table 2-1. Summary of BIA Jurisdiction for the Southern Bighorn Solar Projects**

Project Component	Location	Agency Action	SBSP I (Miles/Acres) <sup>1</sup>	SBSP II (Miles/Acres) <sup>1</sup>
Solar Fields	Moapa River Indian Reservation	Lease <sup>2</sup>	2,600 acres	1,000 acres
Existing Access Roads <sup>3</sup>	Moapa River Indian Reservation	ROW	4 miles / 10 acres	4 miles / 10 acres
New Access Roads <sup>3</sup>	Moapa River Indian Reservation	ROW	2 miles / 7 acres	2 miles / 5 acres
Collector Lines	Moapa River Indian Reservation	ROW	4 miles / 20 acres	2 miles / 14 acres
<b>Total BIA</b>	-	-	<b>10 miles / 2,637 acres</b>	<b>10 miles / 1,029 acres</b>

<sup>1</sup> Acres and miles are approximate. SBSP I consists of three total collector lines, and SBSP II consists of a single collector line. Collector line acreage is based on a ROW that varies from 60 to 120 feet wide for SBSP I and 50 to 80 feet wide for SBSP II, depending on location.

<sup>2</sup> Lease term would be up to 50 years.

<sup>3</sup> A portion of the access roads would be required for both Projects, and the associated acreage is included in the calculations for both Projects. A total of 10 acres of existing access roads and 8 acres of new access roads would be required for the Projects.

**Table 2-2. Summary of BLM Jurisdiction for the Southern Bighorn Solar Projects**

Project Component	Location	Agency Action <sup>1</sup>	SBSP I (Miles/Acres) <sup>2</sup>	SBSP II (Miles/Acres) <sup>2</sup>
Existing Access Roads <sup>3</sup>	BLM-Managed Designated Utility Corridor	ROW	20 miles / 42 acres	20 miles / 42 acres
Existing Access Roads <sup>3</sup>	BLM Lands	ROW	2 miles / 6 acres	2 miles / 6 acres
Collector Lines	BLM-Managed Designated Utility Corridor	ROW	3 miles / 13 acres	< 1 mile / 7 acres
Gen-tie line <sup>4</sup>	BLM-Managed Designated Utility Corridor	ROW	11 miles / 98 acres	11 miles / 98 acres
Gen-tie line <sup>4</sup>	BLM Lands	ROW	< 1 mile / 3 acres	< 1 mile / 3 acres
<b>Total BLM</b>	-	-	<b>36 miles / 162 acres</b>	<b>34 miles / 156 acres</b>

<sup>1</sup> BLM ROW term would be 50 years.

<sup>2</sup> Acres and miles are approximate. Collector line acreage is based on a ROW that varies from 60 to 120 feet wide for SBSP I and 50 to 80 feet wide for SBSP II, depending on location.

<sup>3</sup> The existing access roads would be required for both Projects, and the associated acreage is included for both Projects.

<sup>4</sup> The gen-tie line was constructed as part of the previously approved ESMSP. Gen-tie line construction is not included in SBSPs. The Applicants would each need to obtain ROW from BLM for access to, connection with, and maintenance of the same section of gen-tie.

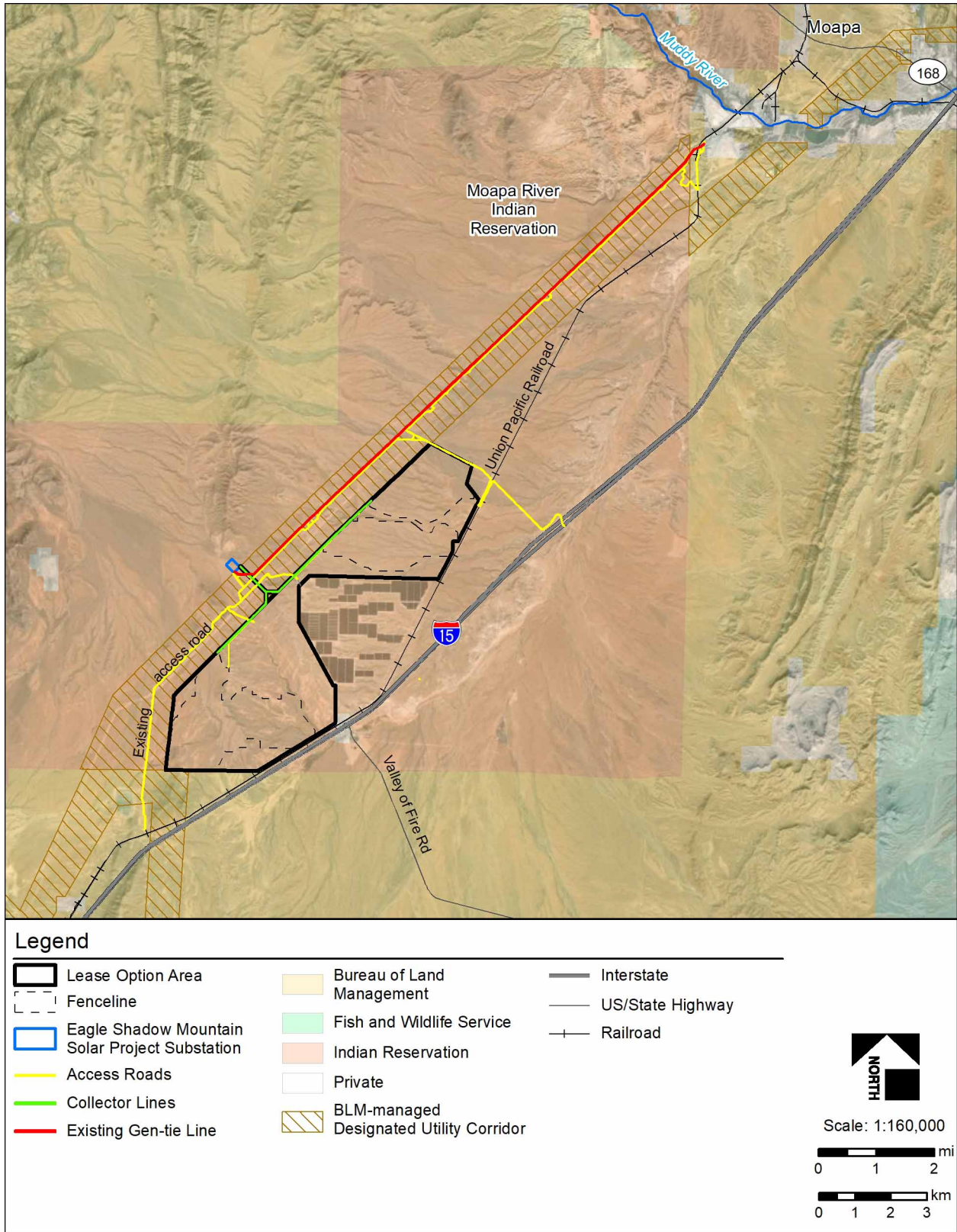


Figure 2-1. Southern Bighorn Solar Project Components

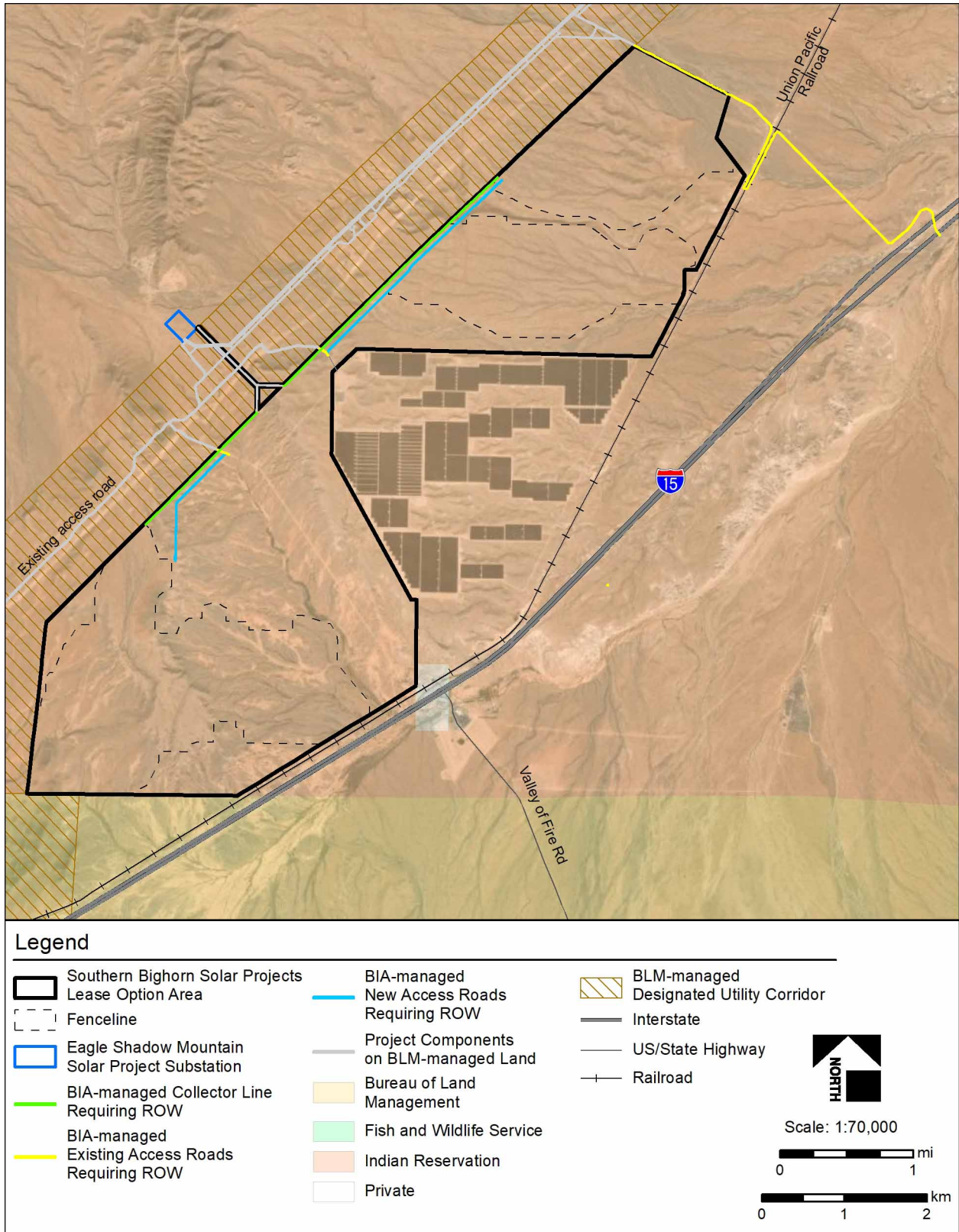


Figure 2-2. Project Components Requiring ROW or Lease from BIA

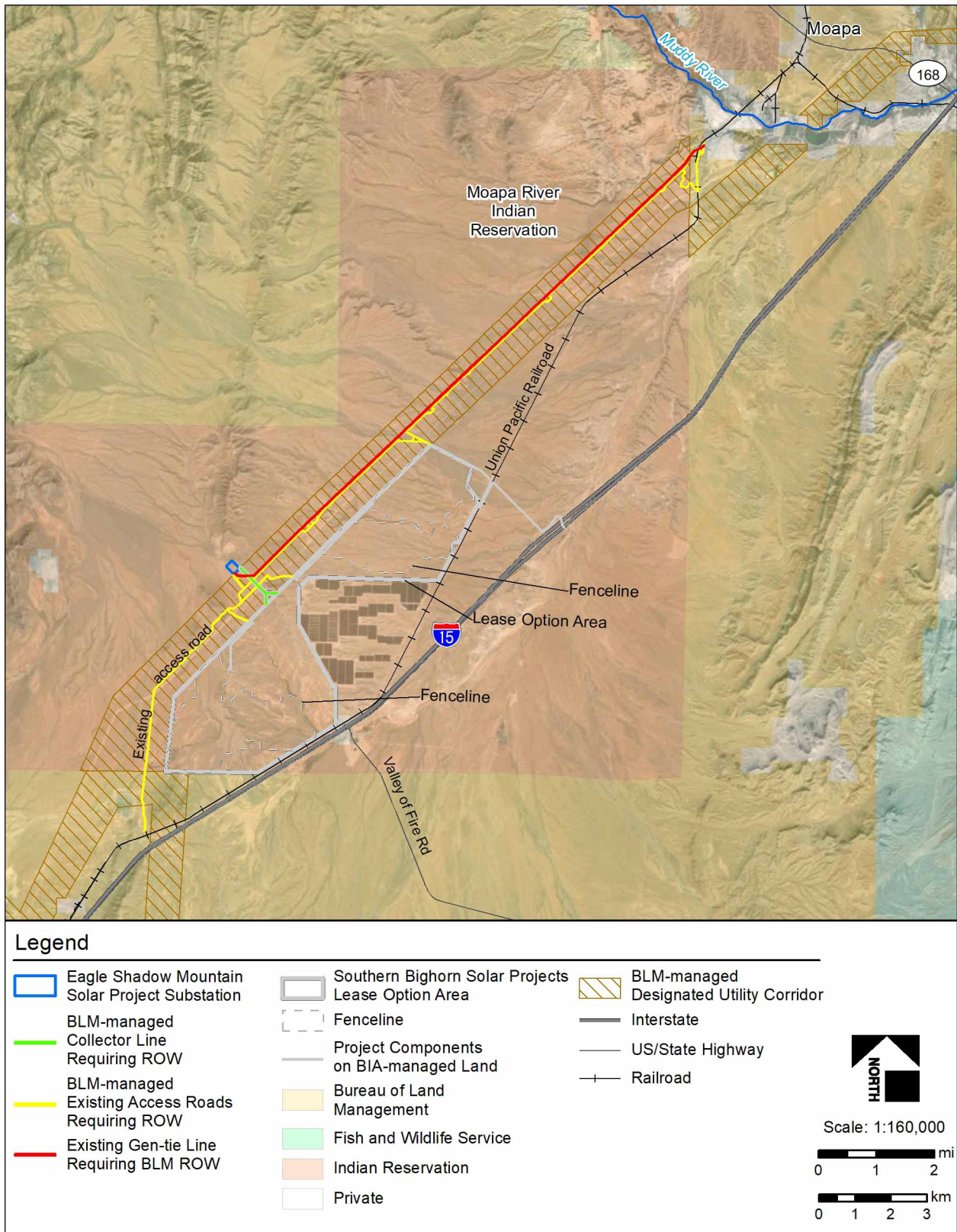


Figure 2-3. Project Components Requiring ROW from BLM

**Table 2-3. Temporary and Permanent Disturbance for the Southern Bighorn Solar Projects**

Project Component	SBSP I Temporary Disturbance (acres)	SBSP I Permanent Disturbance (acres)	SBSP II Temporary Disturbance (acres)	SBSP II Permanent Disturbance (acres)	Combined Temporary Disturbance (acres)	Combined Permanent Disturbance (acres)
Solar Fields <sup>1</sup>	2,139	461	729	271	2,868	732
BIA-managed Collector Lines and Collector Line Access Road	-	20	-	14	-	33
BLM-managed Collector Lines and Collector Line Access Road	-	13	-	7	-	20
New Access Roads to Solar Fields <sup>2</sup>	2	7	2	5	3	8
<b>Total</b>	<b>2,141</b>	<b>501</b>	<b>731</b>	<b>297</b>	<b>2,871</b>	<b>794</b>

<sup>1</sup> Solar fields consist of solar blocks, internal access roads, O&M buildings, parking areas, temporary laydown yards, and perimeter fences.

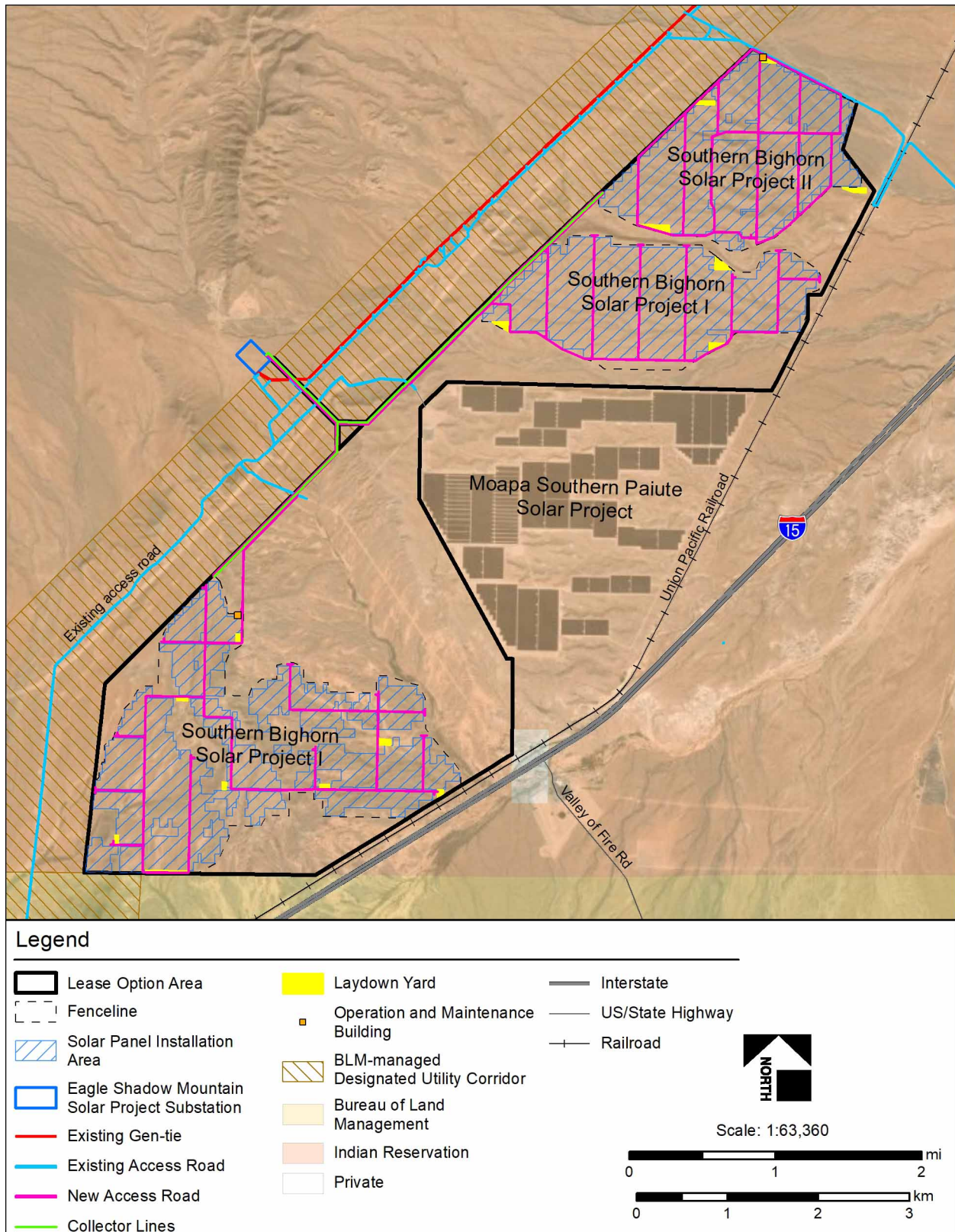
<sup>2</sup> The new access roads only occur on Reservation land. Disturbance estimates include 4.0 acres of new access roads to the solar fields that are common to both Projects, which is included in both disturbance estimates. Disturbance is not anticipated for existing access roads, and thus existing roads are not included in this table.

In some places, areas of temporary disturbance will overlap with areas previously disturbed. The Projects are estimated to result in approximately 501 acres of permanent disturbance for SBSP I and 297 acres of permanent disturbance for SBSP II, as well as 2,141 acres of temporary disturbance for SBSP I and 731 acres of temporary disturbance for SBSP II. Of the temporary and permanent disturbance, none would occur on BLM land; the only Project component on BLM land is the existing access roads, for which no disturbance is anticipated. The Projects include 20 acres of permanent disturbance (13 acres for SBSP I and 7 acres for SBSP II) for the collector lines and collector line access road within the BLM-managed designated utility corridor on the Reservation. There will be no temporary disturbance in the BLM-managed designated utility corridor because it is assumed that the entire collector line ROW would be permanently disturbed. The remaining permanent disturbance and all the temporary disturbance is located on the Reservation. A portion of the new access roads that would be constructed would be required for both Projects, and the associated disturbance is included in the calculations for both Projects (**Table 2-3**).

The Applicants intend to construct the collector lines entirely underground. However, a portion of the collector lines may be constructed overhead where the lines cross the BLM-managed designated utility corridor to avoid conflicts with existing underground utilities. Construction of the collector lines overhead would not change the estimated disturbance because the overhead structures would be constructed within the same ROW and permanent disturbance is accounted for across the entire collector line ROWs for both Projects.

### 2.1.1 Onsite Facilities

The solar fields include the following onsite facilities discussed in detail below: solar blocks, site fencing, communications systems infrastructure, O&M building, and internal access roads. **Figure 2-4** shows the conceptual site plan for the solar fields (this figure also depicts offsite facilities including collector lines and access roads which are discussed in detail in Section 2.1.2).



**Figure 2-4. Solar Field Conceptual Site Plan for Southern Bighorn Solar Projects**



## SOLAR BLOCKS

Mounted PV solar panels, inverter stations, and transformers would be combined to form solar blocks which would be repeated to create electrical energy of up to 300 MWac for SBSP I (approximately 83 solar blocks) and 100 MWac for SBSP II (approximately 28 solar blocks; block size and quantity for both Projects may change based on final design).

The electricity generated from the solar panels (direct electrical current [DC]) would be delivered through underground cables to an inverter station where the DC is converted to alternating electrical current [AC]. Inverter stations are generally located in the middle of each solar block. A transformer would then step up the voltage to 34.5 kV.

The transformers would be contained in steel enclosures. The inverter stations could be contained in an enclosed or canopied metal structure on a skid- or concrete-mounted pad. The enclosures would be designed to meet National Electric Manufacturers Association (NEMA) 1 or NEMA 3R IP44 standards for electrical enclosures in order to contain any fire, should one occur. The enclosures would be constructed on 6 inches of stone with filter fabric underlay; each enclosure pad would be approximately 350 square feet in size. Solar panels would be installed on rows of single-axis trackers that would rotate to follow the sun over the course of the day. A typical PV solar panel layout using single-axis trackers is shown in **Figure 2-5**. Depending on the soil conditions within the solar fields, the wind load capacity of the solar panels, and the mounting structure supporting the solar panels, the foundations for the mounting structures would either be embedded driven steel posts or truss structures with screw anchors or helical anchors. The mounting structures would extend approximately 12 feet below ground and may be encased in concrete or a small concrete footing. The layout of the solar blocks would be optimized for the desired energy production while accounting for site characteristics, such as soil conditions, topography, and hydrology. The solar panels would be up to 20 feet above ground at their highest point, which would occur during the morning and evening hours when the trackers are tilted at their maximum angle (**Figure 2-6**). Each solar block would be powered by a low-voltage electric drive motor. The motors would typically be operated for a few seconds every 5 to 10 minutes during daylight conditions to move the panels in approximately one-degree increments.

Meteorological monitoring stations would be located at multiple locations (up to 15) within the solar blocks to monitor wind speed and communicate with the trackers. This would allow the trackers to rotate the solar panels to a flat position during high winds. Meteorological stations would be mounted on or around the inverter stations and would not exceed 16 feet in height from the ground.

## SITE FENCING

The solar fields and all onsite facilities would be constructed within a chain link perimeter fence, potentially with barbed wire, measuring up to 8 feet in height (from finished grade). The fence would have controlled access points, lighting, and possibly security alarms, security camera systems with remote monitoring, and security guard vehicle patrols to deter trespassing and/or unauthorized activities. The bottom of the fence would have a 6- to 8-inch opening to allow for the movement of desert tortoises into and through the site during O&M. The O&M facilities would be surrounded by fencing that does not include the desert tortoise opening due to safety issues. There would be up to 80,000 linear feet of fencing for SBSP I, and up to 17,000 linear feet for SBSP II, following the perimeters of the properties.

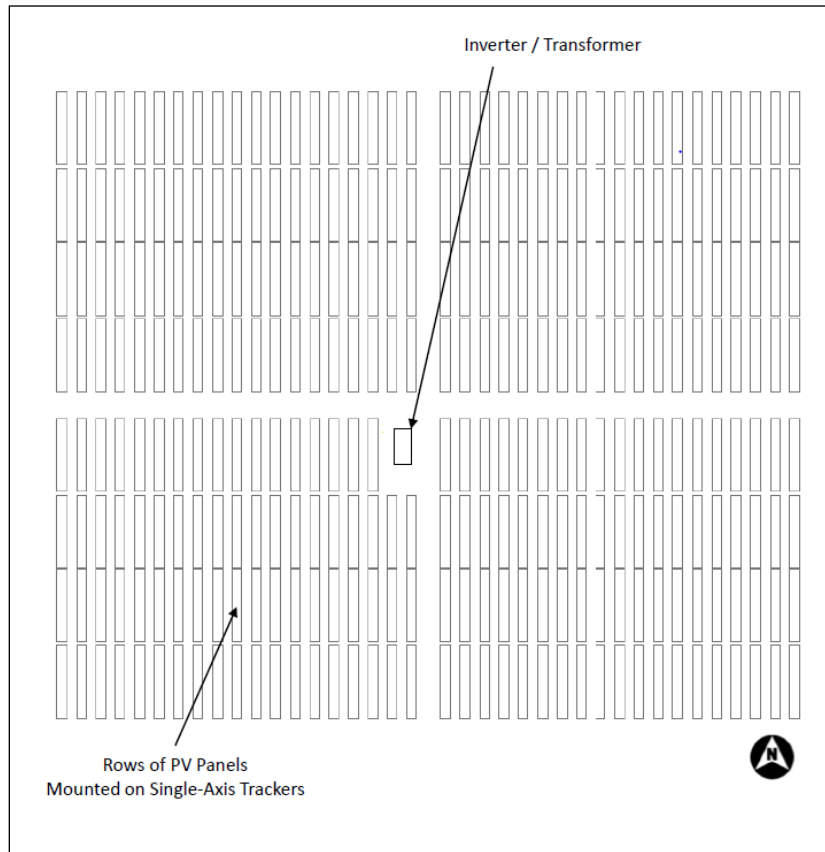


Figure 2-5. Typical Single-Axis Tracker Array Layout

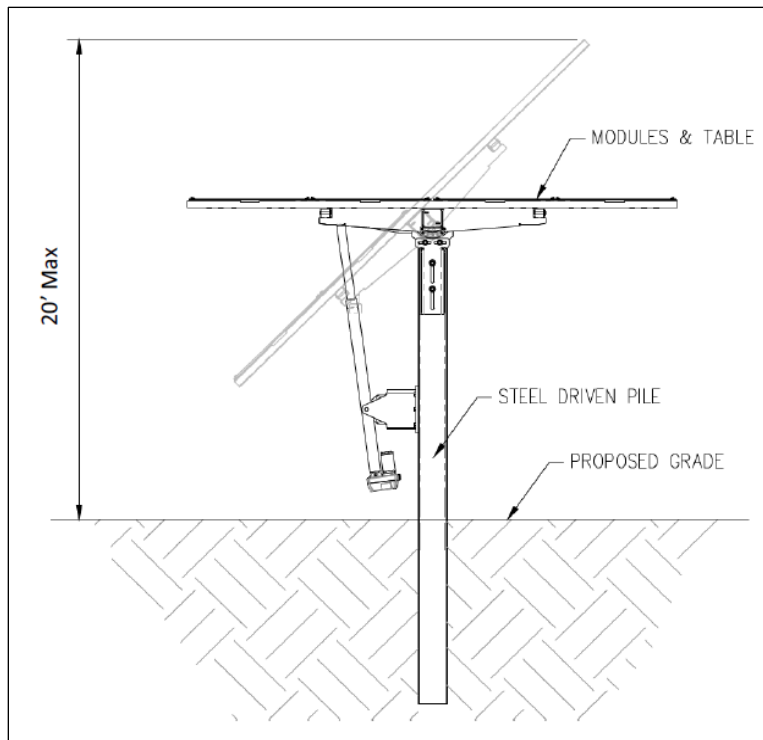


Figure 2-6. Typical Single-Axis Tracker Cross Sectional View

## **COMMUNICATION SYSTEMS INFRASTRUCTURE**

Telecommunications systems would be installed at the transformers, consisting of a remote terminal unit, communications line (i.e., T-1 line), microwave receiver, and miscellaneous communication cables and link equipment, as required. A meter would be installed to measure the energy output of the Projects. The microwave receiver would be mounted on an existing 130-foot-tall lattice structure, constructed as part of the ESMSP, to facilitate wireless communications and provide a back-up option for site telecommunications.

The Projects would include a Supervisory Control and Data Acquisition (SCADA) system that would allow for the remote monitoring and control of inverters and other Project components. The SCADA system would be able to monitor Project output and availability and to run diagnostics on the equipment. This equipment would be in the O&M or control building and would connect to the communications system.

## **OPERATIONS AND MAINTENANCE BUILDING**

The solar fields may include an O&M building with onsite parking for each of the Projects. The O&M building would be steel framed with metal siding and roof panels and would be approximately 80 feet long by 20 feet wide by 20 feet high. The O&M building for each Project could include offices, repair facility/parts storage, a control room, and restrooms. A septic tank and leach field may be installed for collection, treatment, and disposal of sanitary waste. If a septic system were not installed, portable toilets would be used.

Additional components of the O&M building would include aboveground water storage tanks, signage, a flagpole, trash containers, and SCADA system. The O&M building and components would be equipped with exterior lighting, as approved by the Moapa Band and BIA. Minimal lighting would be used and would be directed downward and away from wildlife habitat. Each of the O&M buildings and parking areas would occupy up to 6 acres.

## **ACCESS ROADS**

Within the solar fields, access roads would be built between the solar blocks to provide vehicle access to the solar equipment (e.g., solar panels, inverter stations, transformers). The internal access roads would occupy approximately 55 acres (35 acres for SBSP I and 20 acres for SBSP II). Turnarounds would be constructed at the terminus of the roads to facilitate vehicle and equipment turn-around. The existing soil surface of all access roads would be leveled with a road grader. In addition to grading, access roads that lead to inverter stations would be compacted and graveled with onsite materials.

### **2.1.2 Offsite Facilities**

## **BATTERY ENERGY STORAGE SYSTEM**

The Projects would include one or more BESSs which consist of modular and scalable battery packs and battery control systems that conform to national safety standards. The BESSs would be in pad- or post-mounted, stackable metal structures (approximately 40 feet long by 8 feet wide by 8 feet high) or a separate building in compliance with applicable regulations. The maximum height of a building, if used, would not exceed 25 feet. The total acreage of the BESSs would not exceed 12 acres for each Project. The dimensions and number of BESSs would vary depending on the application, supplier, chosen configuration, and applicable building standards. The BESSs would be located in the high-voltage area established as part of the previously approved ESMSP. Therefore, there would be no additional ground disturbance that has not been analyzed in previous NEPA documentation and there would be no new or modified impacts. Safety and fire prevention at the BESSs will be addressed in the Fire Management Plans that will be prepared for the Project prior to implementation.

## COLLECTOR LINES

Energy generated from the solar blocks would be transferred through collector lines from inverters within each solar field to each Project's substation, located in the previously approved ESMSP high-voltage area. Approximately three sets of collector lines would connect SBSP I to the SBSP I substation in the ESMSP high-voltage area, and approximately one set of collector lines would connect SBSP II to the SBSP II substation in the ESMSP high-voltage area (**Figure 2-4**). At the Projects' substations, the electricity would be stepped up to 230 kV for delivery to NV Energy's Reid Gardner Substation using the gen-tie constructed for the ESMSP. The Applicants intend to install the collector lines and fiber optic communication lines entirely underground, although sections of the lines may be installed overhead where they cross through the BLM-managed designated utility corridor in order to avoid conflicts with existing underground utilities. The locations of overhead collector line installation can only be determined during construction; therefore, the Proposed Action includes overhead and underground construction where collector lines cross the BLM-managed designated utility corridor.

Underground collector lines would be installed in trenches up to 4 feet deep and 10 feet wide. A total of 10 miles of collector lines (7 miles for SBSP I and 3 miles for SBSP II) consisting of four separate lines (three for SBSP I and one for SBSP II) would be constructed. Of this, up to 4 miles (3 miles for SBSP I and 1 mile for SBSP II) may be installed overhead where the collector lines cross the BLM-managed designated utility corridor. The collector lines would be constructed within approximately 33 acres of ROW for SBSP I (13 acres within the BLM-managed utility corridor and 20 acres on the Reservation) and 21 acres of ROW for SBSP II (7 acres within the BLM-managed utility corridor and 14 acres on the Reservation).

Overhead collector lines, if necessary, would include the construction of up to 57 support structures for SBSP I and 20 support structures for SBSP II across up to 2 linear miles for SBSP I (constructed as three parallel collector lines) and 1 linear mile for SBSP II (constructed as a single collector line), all within the BLM-managed designated utility corridor. The structures would be up to 50 to 75 feet above ground and spaced approximately 150 to 300 feet apart. The poles would be buried at 10 percent of the pole height, plus 2 feet. The collector line ROW and permanent disturbance areas are expected to remain the same whether the collector lines are constructed overhead or underground.

## ACCESS ROADS

The primary access routes to the Projects would utilize existing roads. Access would be via I-15 and North Las Vegas Boulevard, and then along existing access roads on the Reservation. These existing roads on the Reservation include the access road for the Southern Paiute Solar Project facility, roads providing access to an existing tribal aggregate operation and water wells adjacent to the Projects, an access road within and adjacent to the BLM-managed designated utility corridor, and an unnamed road that connects to the town of Ute, Nevada. No major upgrades to these existing roads are anticipated; minor maintenance may be required during construction, O&M, and decommissioning.

The Projects also include the construction of new access roads that connect the existing Southern Paiute Solar Project facility roads to the SBSP I and SBSP II solar fields, and a new access road within the proposed collector line ROW. **Figure 2-7** shows the location of the existing roads that would be used and the new access roads that would be constructed.

The Projects would include 66 acres of access roads. Of this, 58 acres are existing access road (6 acres on BLM lands, 42 acres within the BLM-managed designated utility corridor, and 10 acres on Reservation lands). The Projects would require 8 acres of new access roads on Reservation land; of this, 4 acres of new access would be used by both Projects, 3 acres would access SBSP I only, and 1 acre would access SBSP II only.

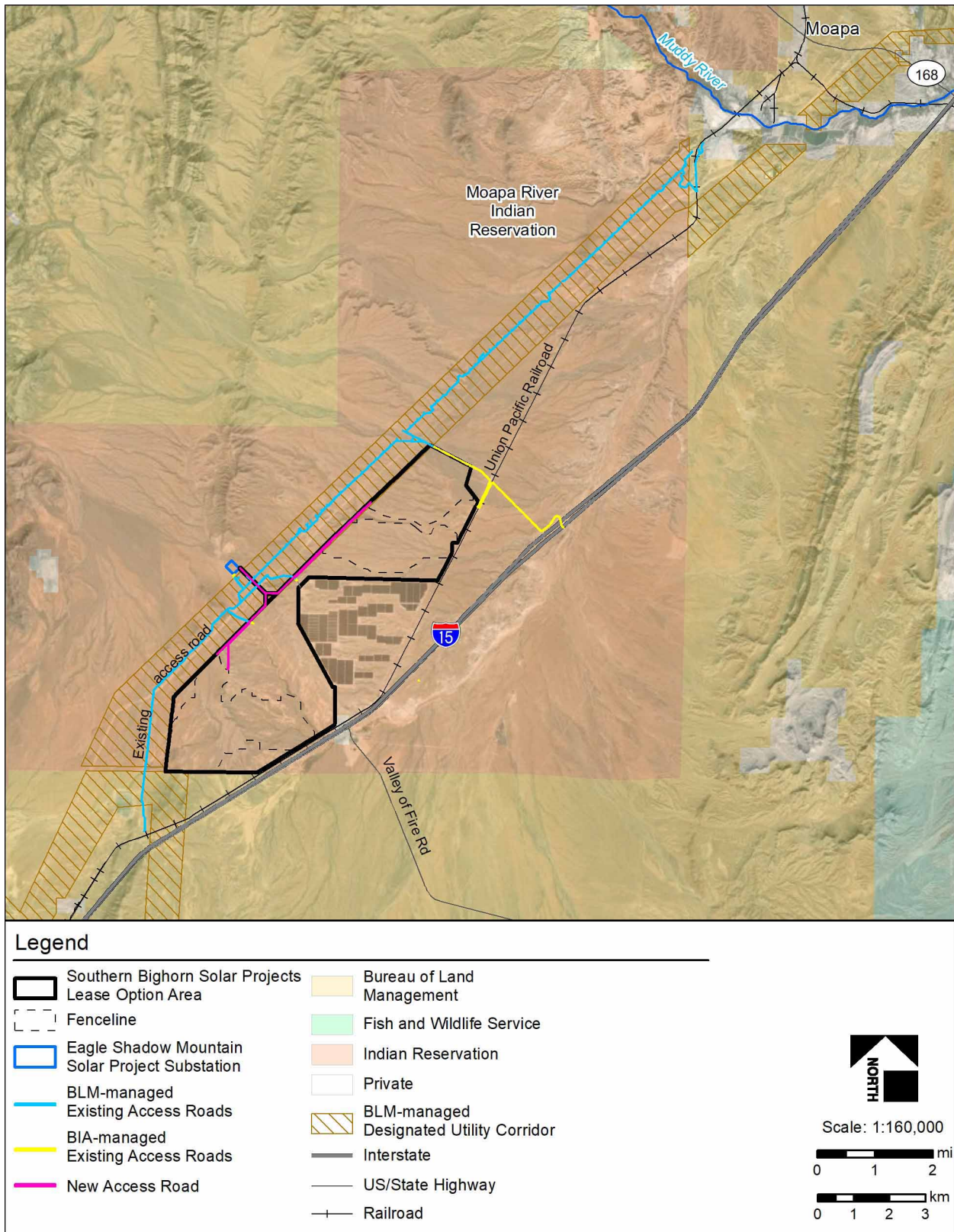


Figure 2-7. Location of Proposed Access Roads

### 2.1.3 Project Construction

Construction of SBSP I is expected to take approximately 14 to 16 months and construction of SBSP II is expected to take approximately 8 to 10 months. The two Projects may be constructed simultaneously or sequentially. The Applicants expect that construction would commence in the fourth quarter of 2021. Refer to the Plan of Development for each of the Projects in **Appendix C** for more information on the construction of the SBSPs.

#### ONSITE FACILITIES

**Grading, Site Preparation, and Vegetation Removal** – Environmental clearance surveys would be performed at the Project sites prior to commencement of construction activities. The boundaries of the Projects would be delineated and marked prior to grading and site preparation. Where necessary, areas to be avoided would be flagged with appropriate buffers to prevent impacts.

Temporary tortoise exclusion fencing would be installed around the perimeter of the Project sites to prevent desert tortoises from moving into the site during construction. Equipment and vehicles would drive over and crush vegetation during construction, where necessary, and vegetation may also be trimmed to approximately 18 inches using a string trimmer or mower (vegetation would not be trimmed shorter than 18 inches tall). The roots of the crushed and trimmed vegetation would be left intact to facilitate regrowth following the completion of construction. A 10-foot-wide firebreak may be established around the outside of the perimeter fence and maintained clear of vegetation. The site would then be graded where necessary, and vegetation would be removed or trimmed in selected areas, as needed for construction. In some areas, small amounts of explosives may be used to crack and remove rock material that is difficult to grade using other methods. This blasting would occur only after biological monitors have cleared the site (see **Appendix B**).

Vegetation would be permanently cleared for new access roads, parking areas, inverter pads, and the O&M buildings. Vegetation would also be crushed and/or trimmed, as needed (using a string trimmer and/or mower), in the solar block locations to create a safe work environment and avoid interference with construction activities. All grading (i.e., cut and fill) required for the Projects would use onsite cut material to the maximum extent practicable. Grading would be required for the O&M buildings, access roads, and select locations with unsuitable topography to establish solar blocks. A small, graded pad would be required within each solar array to accommodate the inverter and transformer unless they are installed on driven piers. The solar fields would require a positive natural terrain slope of less than five percent.

**Gravel/Aggregate/Concrete** – Concrete would be trucked in and poured in place for mounting structures and building foundations. Aggregate material would be used for parking areas and access roads, and riprap material may be needed for erosion control. A 6-inch-deep layer of aggregate stone would be installed in any low water crossings. This material would be sourced from the Moapa Band's existing gravel materials operation located immediately adjacent to the solar fields, as available. During construction, a temporary office for use during the construction phase of the Project will be erected. After the O&M building is constructed, the surrounding area would be appropriately surfaced for parking, roads, and material storage.

**Solar Block Assembly and Construction** – Construction work within each solar block would generally proceed as follows:

- Install foundations for inverter stations;
- Prepare trenches for underground cables;
- Install underground cable, as required;
- Backfill trenches;
- Install concrete footings for transformers;
- Install inverter station and transformer equipment;
- Install steel posts and tracker assemblies;
- Install solar panels;
- Perform electrical terminations; and
- Inspect, test, and commission equipment.

The solar blocks would be installed with solar panels mounted on steel tracker assemblies which would be supported by steel posts. The structural steel posts may be galvanized to prevent potential damage from corrosive soils, as needed. Trucks would be used to transport the solar panels to the solar field. Final solar field assembly would require small cranes, tractors, and forklifts.

**Additional Solar Field Construction** – Cable trenches within the solar fields would contain electrical conductors for low-voltage power collection and fiber optic cables for equipment communication. Trenches would vary from 2 to 8 feet wide and 2 to 5 feet deep. Trench excavation would be performed with conventional trenching equipment and excavated soil would be placed adjacent to the trench and used as backfill once installation is complete.

Installation of electrical equipment and necessary infrastructure to energize the equipment would consist primarily of the following tasks:

- Equipment – Installation of all electrical equipment including circuit breakers, switches and switchgear, lighting, and control systems, including SCADA equipment.
- Cables – Installation of all cables necessary to energize the equipment. Cables would be routed via cable trays, above-grade conduits, and below-grade conduits.
- Grounding – All equipment and structures would be grounded, as necessary.
- Telecommunications – Communication systems including T-1 internet cables, fiber optic, and telephone would be installed during electrical construction.

**Laydown Yards** – Approximately 15 temporary laydown yards totaling approximately 31 acres would be established within the solar fields (11 laydown yards totaling 19 acres for SBSP I, and 4 laydown yards totaling 12 acres for SBSP II). The laydown yards would be used to stage equipment during construction. Vegetation within the laydown yards would be crushed and/or trimmed as needed using a string trimmer and/or mower, but these areas would not need to be graded or compacted. Where practical, laydown yards would be developed into solar blocks as construction progresses and the laydown yards are no longer needed.

**Support Facilities Construction** – Following grading and site preparation, concrete foundations would be poured to support the permanent O&M buildings, one for each Project, located near the solar field entrances. An area adjacent to the building would be developed for parking.

A septic tank and leach field may be constructed for each Project for the collection, treatment, and disposal of sanitary waste. Excavation for the septic tank would be completed with the use of backhoe, and excavated soil would be placed adjacent to the septic tank location and used as backfill once installation is complete; excess soil would be reused onsite, if necessary.

A temporary construction office (one for each Project) consisting of a trailer or storage container (e.g., Connex box) would be placed on site during construction. The construction office for each Project would be located at

the solar field entrance, and the temporary office site would be adjacent to the O&M building for each Project. Water holding tanks, portable toilets, and generators would also be used during construction for each of the two Projects. Permanent fencing would be installed around the solar field perimeter.

The design and construction of the buildings and associated water/wastewater systems would be consistent with Clark County building standards and approved by the Moapa Band and BIA.

## **OFFSITE FACILITIES**

**Access Roads** – Construction of new access roads will involve grading and filling with dirt to create a 15- to 24-foot-wide roadbed. Road berms will also be constructed using fill dirt obtained from the two Project areas. Any low water crossings will be filled with aggregate stone to a depth of approximately 6 inches. New access roads would be left in place after construction is completed and new and existing access roads used by the Projects would not be upgraded or widened, but some maintenance—including grading and vegetation removal—may be required depending on their condition. All grading (i.e., cut and fill) required for the Projects would use onsite cut material, and no fill material would be exported or imported, if practicable.

**Collector Line Construction** – It is estimated that construction of the collector lines would result in permanent disturbance of the entire ROWs for both Projects, including 33 acres for SBSP I and 20 acres for SBSP II, though the actual permanent disturbance would likely be less than this. A total of 10 miles of collector lines (7 miles for SBSP I and 3 miles for SBSP II) consisting of four separate lines (three for SBSP I and one for SBSP II) would be constructed. Of this, up to 4 miles (3 miles for SBSP I and 1 mile for SBSP II) may be installed overhead where the collector lines cross the BLM-managed designated utility corridor.

The primary stages of the underground collector line installation would be trenching, installing conduit, backfilling, and lastly, pulling wire through the conduit. The collector lines and fiber optic lines would be installed in trenches up to 10 feet wide and 4 feet deep.

The primary stages used to construct the overhead collector lines, if necessary, to avoid conflicts with underground utilities in the BLM-managed designated utility corridor, would be foundation installation, structure installation, and conductor stringing.

Wooden poles used for the overhead collector line structures would be directly embedded into the ground and would be installed by auguring holes and placing the poles into the holes using backhoes or heavy lifter vehicles. A 100-foot by 40-foot area would be needed around each of the wooden poles for construction (57 poles for SBSP I and 20 poles for SBSP II). These areas would be disturbed during construction activities and would be cleared of vegetation only as required for safety and efficiency. The primary equipment used in setting foundations would include concrete trucks, auger rigs, pickup trucks, cranes, and front-end loaders. Excavated spoil material would be spread around the temporary work areas.

After the poles are erected, the conductors and static wires would be strung between the poles and attached. Equipment would pull the conductors and wires into place from designated pull and tensioning sites. These sites would be approximately 120 feet wide by 500 feet long and located within the ROW. Stringing would likely be conducted one conductor at a time, with all equipment in the same location until all lines are in place. Wire stringing is typically completed with heavy-duty trucks equipped with a telescoping boom lift.

## **SITE STABILIZATION, PROTECTION, AND RECLAMATION**

Appropriate erosion- and dust-control measures would be implemented during construction of the solar fields and collector lines to prevent increased dust and erosion. The Applicants have prepared a draft Site Restoration Plan (**Appendix D**) which documents erosion- and dust-control measures to be implemented during and/or



immediately after construction for the areas that are temporarily disturbed. This includes soil stabilization measures to prevent soil from being eroded by stormwater runoff, establishment of temporary laydown areas on level ground, avoiding blading in laydown areas, and minimizing and controlling dust generated during construction by applying water and/or agency-approved palliatives.

Soil stabilization measures in the Site Rehabilitation and Restoration Plan include BMPs to protect the soil surface by covering or binding soil particles. Depending on the site preparation technique, organic matter could be worked into the upper soil layers or mulched onsite and redistributed into the fill (except under equipment foundations, trenches, and roadways) to aid in dust control. Prior to construction, the construction contractor would also develop and implement an erosion control plan for the Projects and incorporate measures required by regulatory agency permits and contract documents as well as other measures selected by the contractor. Project-specific BMPs would also be designed by the contractor to protect the soil surface from erosion and would be included in the Projects' Stormwater Pollution Prevention Plan (SWPPP). Disturbed areas would also be seeded, and hay, straw mulch, or other approved material would be applied to aid in stabilizing disturbed areas.

During construction, up to 400 acre-feet (AF) of water (200 AF for each Project) would be required for dust control and would be obtained from the Moapa Band. If needed to control dust during construction, agency-approved palliatives would be applied to newly constructed access roads.

### **CONSTRUCTION STAFF**

Construction staff for the Projects would consist of laborers, craftsmen, supervisory personnel, support personnel, and construction management personnel. Construction staff is anticipated to include an average of 300 workers, with a peak not expected to exceed 750 workers at any given time, for each of the two Projects. Most construction staff would commute daily to the jobsite from within Clark County, primarily from the Reservation and the Las Vegas area. The Applicants would prepare a Worker Environmental Awareness Program for the Projects to address Project-specific safety, health, and environmental concerns. All construction staff would be required to complete Worker Environmental Awareness Program training.

Construction generally would occur between 5:00 a.m. and 5:00 p.m., Monday through Friday, but could occur seven days a week. Additional hours could be necessary to make up schedule deficiencies or to complete critical construction activities. For instance, during hot weather, it may be necessary to start work earlier (e.g., at 3:00 a.m.) to avoid work during high ambient temperatures. Further, construction would require some nighttime activity for installation, refueling equipment, staging material for the following day's construction activities, service or electrical connection, or inspection, quality assurance/control, and testing activities. Nighttime activities would be performed with temporary lighting. Some activities may require construction activities 24 hours per day, 7 days per week.

### **2.1.4 Operations and Maintenance**

Below is a discussion of O&M activities following construction. Refer to the Plan of Development for each of the Projects in **Appendix C** for more information on O&M of the SBSPs.

#### **ONSITE FACILITIES**

The O&M activities for the solar fields include regular monitoring, periodic inspections, and any needed maintenance. It is anticipated that up to five full time-equivalent positions would be required during O&M for each of the Projects. This workforce would include administrative and management personnel, operators, and security and maintenance personnel. Typically, up to three staff would work during the day shift (sunrise to sunset) and the remainder during the night shift and weekends.

During the first year of operation, inspections would be more frequent to address identified post-construction issues. Periodic routine maintenance would include monthly, quarterly, semi-annual, and annual inspections and service. Major equipment maintenance would be performed approximately every 10 to 15 years.

Solar panel washing would be conducted periodically as needed to improve power generation efficiency. Dust would be controlled and minimized by applying water and palliatives. The water requirements would be provided from existing water rights owned by the Moapa Band and leased to the Applicants. Water demand for panel washing and human use during O&M activities would not exceed 20 AF per year (AFY) for each of the two Projects. A small water treatment system may be installed to provide deionized water for panel washing.

O&M would require the use of vehicles and equipment including crane trucks for minor equipment maintenance. Additional maintenance equipment may include forklifts, manlifts, and chemical application equipment for weed control. Pick-up trucks would be used daily onsite. No heavy equipment would be used during normal operations.

Vegetation within the solar blocks would be allowed to grow back following construction and would be maintained at a height of 18 inches during O&M. Vegetation would be driven over and crushed or trimmed as needed using a string trimmer and/or mower. Vegetation would be trimmed at approximately 18 inches tall. This method would leave the roots intact allowing herbaceous and woody vegetation to re-establish.

Safety precautions and emergency systems would be implemented as part of the design and construction of the Projects to ensure safe and reliable operation. Administrative controls would include classroom and hands-on training in O&M procedures, general safety items, and a planned maintenance program. These would work with the system design and monitoring features to enhance safety and reliability. The Projects would also have a Spill Prevention and Emergency Response Plan which would be developed prior to construction. This plan would address potential emergencies including chemical releases, fires, and injuries. All employees would be provided with communication devices (cell phones, and/or walkie-talkies) to provide aid in the event of an emergency.

The Applicants have prepared a draft Integrated Weed Management Plan (**Appendix E**) for the Projects as required by BIA and the BLM (BIA 2014; BLM 2007). Herbicides would be used to control noxious and invasive weeds, if required. Pest control may also be required, including control of rodents and insects inside of O&M facilities.

The primary wastes generated during O&M activities would be nonhazardous solid and liquid wastes. Limited quantities of hazardous materials would be used and stored on the solar fields. Nonhazardous wastes produced by O&M activities would include defective or broken electrical materials and batteries, empty containers, typical refuse generated by workers and small office operations, and other miscellaneous solid wastes. The Spill Prevention and Emergency Response Plan that will be prepared by the Applicants would address waste and hazardous materials management, including BMPs related to storage, spill response, transportation, and handling of materials and wastes. Waste management would emphasize the recycling of wastes where possible and would identify the specific landfills that would receive waste that cannot be recycled.

The fire protection water system would be supplied from the water storage tank(s) located near O&M building. The fire protection water system would have the appropriate fire department connections and would be consistent with Clark County requirements. The Applicants would prepare and implement a Fire Management Plan for O&M activities.

## OFFSITE FACILITIES

The collector lines would operate continuously throughout the life of the Projects. Operational activities associated with the collector lines would involve periodic inspection and occasional maintenance and repair. Periodic visual inspections would be conducted on the aboveground inverter stations for underground collector lines, and insulators, overhead grounds, and structure hardware for overhead collector lines, where necessary. Collector line access roads are not expected to require frequent maintenance but could be graded as needed to provide access to structures for maintenance activities.

Maintenance of overhead sections of collector lines would also include removal of all vegetation to bare ground within a 10-foot radius around each pole structure. This vegetation treatment is called Defensible Space around Poles and protects the poles from fire, prevents fire ignition from electrical equipment that may spark, and provides a safe area for access during inspection and maintenance.

Other O&M activities, as needed, could include insulator washing, periodic aerial inspections, repair or replacement of underground collector lines and overhead conductors and insulators, and response to emergency situations (e.g., outages) to restore power. Except for emergency situations and outages, most maintenance work would take place during daylight hours. The BESSs would contain lithium-ion batteries that would need replacement periodically; used batteries would be disposed of according to local, State, and federal regulations.

### 2.1.5 Decommissioning

Following O&M, the Projects would be taken out of service and associated onsite and offsite facilities would be removed. Decommissioning would involve removal of the solar blocks and other facilities, with some buried components (such as cabling) potentially remaining in place. Decommissioning would be completed prior to the expiration of the lease and ROW agreements.

To ensure that the permanent closure of the facility does not have an adverse effect, the Applicants have prepared a draft Decommissioning Plan included as **Appendix F**. The final Decommissioning Plan would be developed near the time of decommissioning in coordination with the Moapa Band and BIA, with input from other agencies as appropriate. The final plan would address future land use, removal of hazardous materials, impacts and mitigation associated with closure activities, schedule of closure activities, equipment to remain onsite, and conformance with applicable regulatory requirements and resource plans.

The collector lines would also be taken out of service in accordance with local, State, and federal regulations. Prior to removal, laydown yards would be delineated along the collector lines, as appropriate. It is anticipated that decommissioning of the collector lines would be completed within the boundaries of the existing footprint for both Projects.

Following decommissioning, the disturbed areas would be stabilized and revegetated. Native species would be used for revegetation, if appropriate, using BLM- and BIA-recommended seed mixes. Revegetation would occur during the appropriate time of year for optimal regrowth. Seed would be planted using drilling, straw mulching, or hydromulching, as appropriate.

### 2.1.6 Management Plans, Best Management Practices, and Mitigation Measures

The following Management Plans would be prepared by the Applicants and would be submitted to the Moapa Band, BIA, BLM, and USFWS (as appropriate) for approval. Management plans not included as an appendix to this EIS will be prepared and approved prior to implementation of the Projects.

In addition, the Proposed Action for both Projects includes BMPs intended to avoid or reduce environmental impacts associated with the SBSPs. These can be found in **Appendix B**.

- Site Restoration Plan (**Appendix D**)
- Integrated Weed Management Plan (**Appendix E**)
- Decommissioning Plan (**Appendix F**)
- Traffic Management Plan (**Appendix G**)
- Bird and Bat Conservation Strategy (**Appendix H**)
- Raven Control Plan (**Appendix I**)
- Gila Monster Reporting Protocol (**Appendix J**)
- Desert Tortoise Translocation Plan (Appendix to Biological Opinions in **Appendix N**)
- Spill Prevention and Emergency Response Plan
- Fire Management Plan
- Dust Abatement Plan
- Health and Safety Program
- Hazardous Materials and Waste Management Plan
- Stormwater Pollution Prevention Plan
- Site Drainage Plan
- Worker Environmental Awareness Program
- Unanticipated Discoveries Plan

## 2.2 Alternative 2 – No Action Alternative

Under NEPA, the BIA and cooperating agencies must consider an alternative that assesses the impacts that would occur if the Projects were not constructed. The No Action Alternative assumes that the lease agreements would be denied, the BLM ROWs would not be issued, and the Projects would not be built. Under the No Action Alternative, the purpose and need of the Projects would not be met. The Moapa Band would not benefit economically from the energy production that would be obtained from the solar Projects. The development of sustainable renewable resources would not occur, and the State of Nevada would not be assisted in efforts to meet its renewable energy goals.

## 2.3 Alternatives Considered but Eliminated from Detailed Analysis in the EIS

Federal agencies are required under NEPA to rigorously explore and objectively evaluate reasonable alternatives and to briefly discuss the reasons for eliminating any alternative not developed in detail (40 CFR § 1502.14)<sup>1</sup>. Several alternatives were considered during the development and scoping phases of the Projects. The alternatives below were not carried forward for detailed analysis because they would be ineffective (it would not respond to or meet the purpose and need), were determined to not be technically or economically practical

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<sup>1</sup> References to the Council on Environmental Quality NEPA regulations throughout this Final EIS are to the regulations in effect prior to September 14, 2020. This Final EIS does not refer to the revised NEPA regulations effective September 14, 2020 because the NEPA process associated with this proposed action began prior to the effective date of the revised NEPA regulations.

or feasible, or would cause greater environmental effects than the alternatives analyzed in detail. The justifications for eliminating these alternatives are described briefly below.

### **2.3.1 Alternative Reservation Locations**

The Applicants and the Moapa Band considered other areas on the Reservation for potential solar development. This evaluation considered a variety of factors, including the need for up to 3,600 contiguous developable acres, topography, drainage, potential impacts to sensitive resources (including special status species and cultural resources), and proximity to existing infrastructure, transmission interconnection points, and access.

This process was designed to identify areas with the greatest potential for development while minimizing potential adverse impacts and permitting issues. This included making use of existing infrastructure to minimize disturbance and impacts associated with the access roads and collector lines. Large portions of the Reservation were eliminated from further consideration by applying these criteria. Additionally, the approved ACSP site, the approved Aiya Solar site, the approved ESMSP site, and other sites on the Reservation previously studied and eliminated by the K Road (now called Southern Paiute Solar Project) EIS (BIA 2012a) were not considered. The Moapa Band has been working very closely with several solar power providers from across the U.S. and has current partnerships to consider, and they intend to propose construction of up to four additional solar facilities on tribal land on the southern half of the Reservation over the next ten years. Each of these solar generation facilities will provide between 250–350 MW of clean solar power to thousands of consumers. Many potentially suitable areas outside these designated areas are precluded because they are in use by or are proposed for other energy projects (primarily solar) or have other constraints, including potential impacts on desert tortoise and other wildlife. In addition, the 6,000 acres of desert tortoise relocation areas associated with the Southern Paiute Solar Project are not available for development. The Moapa Band has designated the boundaries of the lease option area for consideration for these Projects. Areas outside of the designated lease option area are prohibited for consideration for use by the Moapa Band.

The Moapa Band dismissed some areas on the Reservation due to resource constraints. Other suitable development sites on the Reservation either have been already developed, approved for other solar projects, are under consideration for other solar projects, or would have similar or greater consequences.

### **2.3.2 Alternative Off-Reservation Locations**

The Projects are, by the terms of their purpose, limited to locations on the Reservation on land held in trust by the federal government for the Moapa Band. Accordingly, BIA did not consider off-Reservation alternatives as off-Reservation locations would not meet aspects of the Project's purpose and need which would be to provide a long-term, viable economic revenue base (lease income) and job opportunities for the Moapa Band.

### **2.3.3 Modified Alternative with Drainage Buffers**

A recommendation received during the scoping period was to consider a modified alternative to provide for additional area to accommodate larger buffers around drainages. It was noted that the Yellow Pine Solar Project, located approximately 60 miles southwest of the SBSPs, applied 500-foot buffers on either side of drainages. This modified alternative was presented so that larger drainages may adjust to the new hydraulic conditions without the need for major human-made structures. We considered applying a buffer of 500 feet on either side of drainages (1,000-foot-wide corridor) for the SBSPs. However, there is a limited amount of land available to the Moapa Band. The entire Moapa River Indian Reservation land base is 71,954 acres, all of which was set aside for the "benefit and use of the Moapa Band..." This limited land base likewise limits the economic opportunities available to the Moapa Band.

Applying a 500-foot buffer and considering this alteration would remove approximately 950 acres (790 acres from SBSP I and 160 acres from SBSP II) of usable land from the lease option boundary. This represents approximately 1.3 percent of the total tribal land base and approximately 26.4 percent of the 3,600 acres that the Moapa Band has made available for the lease. Adding the drainage buffers to these Projects would require that an additional 950 acres be developed for solar within the Reservation over that currently proposed to create the same amount of energy and economic benefit to the Moapa Band.

Providing a 500-foot buffer on either side of each drainage (1,000-foot-wide corridor) would not provide enough useable land in the lease boundary to generate the required output to meet the existing Power Purchase Agreement. Engineering designs must consider drainage/stormwater flows for construction feasibility. A hydrology study for the SBSPs was prepared and includes a physical process model that routes rainfall runoff and flood overflow surfaces. The hydrology study considers the construction, operation, and stormwater flows of the additional solar projects. Site design and the placement of Project components were designed to avoid potential impacts to or from surface and stormwater flows based on the results of the hydrology study.

The maximum fence lines that were identified for analysis in the EIS are based on 30 percent engineering designs and the potential lease areas identified within the Option Area, as designated by the Moapa Band, and have been optimized to reduce grading and drainage impacts to the extent possible. Moreover, none of the drainages in this area are EPA- or U.S. Army Corp of Engineers (USACE)-jurisdictional. Although none of the onsite drainages are subject to the jurisdiction of the USACE or EPA, if they were, the agencies' jurisdiction would extend only to the ordinary high-water mark. A buffer around drainages was applied in consultation with hydrology experts such that all the Project features in the Proposed Action were designed and located to meet the drainage needs of the site and minimize grading during site preparation. Therefore, BIA did not consider an alternative that would add wider buffers around the existing drainages to be viable because implementing this suggestion would make development of much of the land within the Lease Option Area infeasible and hinder the Moapa Band's ability to obtain the economic benefits of its sovereign lands.

#### **2.3.4 Alternative Collector Line Alignments**

Collector lines are necessary to connect each of the three solar fields to the substations in the previously approved ESMSP high-voltage area. One early consideration was to have the collector lines from each solar field cross the BLM-managed designated utility corridor individually and connect to the substations on the northwestern side of the utility corridor. The collector lines would cross the BLM-managed designated utility corridor in three separate locations, resulting in additional potential conflicts with existing utilities and future utilities in the corridor. Through the public and interagency scoping process, the BLM rejected the idea of three separate crossings and requested joining the collector lines to cross the utility corridor in one location. The BLM suggested the only viable option is to have one crossing to reduce utility conflicts. Therefore, this alternative was eliminated from further consideration and additional evaluation.

#### **2.3.5 Concentrated Photovoltaic (CPV) Technology**

Concentrated Photovoltaic (CPV) technology uses layers of wafers to absorb different wavelengths of sunlight and provide more power conversion efficiency than typical PV solar panels. This technology requires dual tracking technology to provide critical alignment with direct sunlight in order to be efficient. CPV is generally mounted on taller structures than traditional PV (as high as 40 feet above the ground surface). Because this technology is relatively new, there are risks for long-term performance reliability and manufacturing capacity to supply large-scale utility projects. Therefore, this alternative has not been carried forward for detailed analysis.

### 2.3.6 Distributed Solar Generation

The concept of distributed solar generation locates smaller projects near the demand for electricity. Generally, these projects would generate power using PV solar panels (like all PV technologies). The PV solar panels could be installed on private or publicly owned residential, commercial, or industrial building rooftops, or in other disturbed areas such as parking lots or adjacent to existing structures such as substations. To be a viable alternative to the proposed Projects, there would need to be enough locations where new distributed solar generation could be installed to cumulatively generate up to 400 MW of capacity, and enough local demand for this electricity.

In order to meet the purpose and need, generation would need to be located on the Reservation and there are insufficient rooftops or other disturbed areas on the Reservation to make this option viable. Also, a true distributed generation project typically generates less than 10 MW and could not meet one of the fundamental objectives of the proposed utility-scale solar project: to provide renewable energy to a utility provider. Rooftop systems that lack transmission only generate power for onsite consumption, and the limited on-Reservation uses create only a fraction of the demand that these Projects seek to serve. Distributed generation projects cannot fill the same energy needs as utility-scale projects, and one is not a feasible alternative for the other.

### 2.3.7 Wind Energy

Wind carries kinetic energy that can be utilized to spin the blades of wind turbine rotors and electrical generators, which then feed AC electricity into the utility grid. Most state-of-the-art wind turbines operating today convert 35 to 40 percent of the wind 's kinetic energy into electricity. A single 1.5 MW turbine operating at a 40 percent capacity factor generates 2,100 MW hours annually. In 2012, the average size of wind turbines was 2.5 MW with 7.5 MW turbines the largest in use today (American Wind Energy Association 2018).

The technology is well developed and can be used to generate significant amounts of power. The use of wind energy on the Reservation could potentially be feasible at the scale/size of the Proposed Action if enough wind resources were available, but it would not eliminate impacts caused by the Proposed Action. A wind project would result in impacts on biological and cultural resources, and visual effects would be greater than with the Proposed Action. The acreage of the impacted area would be dependent on the size of the turbines selected.

Wind energy was eliminated from detailed discussion because this area has not been identified to have a sufficient wind resource, and this alternative would not be technically or economically feasible to implement. Additionally, wind energy was eliminated from detailed consideration because it would not meet the BIA's purpose and need to respond to the Applicant's applications.

# CHAPTER 3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

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## 3.1 Introduction

The information in this chapter describes the affected (existing) environment in the Project area and presents the potential effects of the Proposed Action and the No Action Alternatives. Measures to avoid or minimize impacts have also been identified and are listed at the end of each resource discussion. The terms “impacts” and “effects” are used interchangeably, and the terms “increase” and “decrease” are used for comparison purposes. Direct, indirect, and cumulative impacts are described in this chapter. Potential impacts are described in terms of duration, intensity, and context. Definitions of impact terms are provided below.

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

For the purposes of this analysis, duration (temporal scale) of the direct or indirect effects of the analysis is defined as follows. These durations would apply to each of the resources/uses that are analyzed in this EIS but may vary slightly depending on the resource/use. Fifty years would include the expected duration of the life of the solar energy facility, allowing for construction and decommissioning.

- **Short-term:** impacts that would be less than 5 years in duration.
- **Long-term:** impacts that would be 5 years or greater in duration.

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

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

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

- **Local:** within and immediately adjacent to the Project area.
- **Regional:** remaining area outside of but within 30 miles of the Project area.

As previously discussed in Chapter 1, the proposed SBSPs would be the fifth and sixth utility-scale PV solar projects on the Reservation to be recently evaluated in an EIS. All but one of the previously evaluated facilities fall within the same vicinity and are adjacent to the lease option area under evaluation in this EIS. Additionally, the type of facilities, location, and many of the activities evaluated in the previous EISs would be the same as, or similar to, the analysis for these facilities. This EIS considered the previous analyses performed for the other



solar projects on the Reservation and incorporates the analysis and studies by reference in this EIS, where applicable. The previous EISs for the other four previously evaluated solar projects on the Reservation can be found at the following link: <https://www.southernbighornolareis.com>.

Referencing allows BIA to prepare environmental documents without duplicating relevant portions of the previous EISs and RODs. Since potential impacts to resources from construction, O&M, and decommissioning of these previous solar energy generating facilities have been analyzed in the previous NEPA documents, the analysis of the relevant resources will be incorporated by reference and will not be repeated in this EIS.

The BIA’s NEPA Guidebook (BIA 2012b) identifies the resources that must be considered in all BIA environmental documents. **Table 3-1** outlines all the resources considered by the BIA and cooperating agencies (including the issues identified during scoping) for evaluation in this EIS. Each resource was evaluated for its potential to be affected by the Proposed Action and whether implementation of the proposed SBSPs could result in a change to existing conditions. **Table 3-1** identifies those resources that may be affected by the Proposed Action which are evaluated in detail in subsequent sections of this EIS and provides the rationale for the exclusion of a detailed analysis of other resources.

**Table 3-1. Determination and Rationale for Detailed Analysis by Resource/Use**

Resource/Use	Rationale for Not Analyzing in Detail
Air Quality	<p>The SBSPs are within the same airshed (hydrologic area 218 – California Wash) as the four previous EISs for solar projects on the Reservation—Southern Paiute Solar Project (BIA 2012a), ACSP (BIA 2020c), Aiya (BIA 2016), and ESMSP (BIA 2019a). These analyses determined that potential impacts from construction, O&amp;M, and decommissioning of a solar facility and gen-tie line on local and regional air quality would result from fugitive dust emissions and vehicle exhaust emissions, primarily during construction. Further, they determined that the impacts would be minor because of implementation of BMPs for dust control and would not require additional measures to minimize or avoid adverse impacts. Following construction, O&amp;M of the solar projects was not expected to contribute to measurable or detectable impacts to air quality (BIA 2012a: pages 4-26 through 4-31; BIA 2014: pages 4-22 through 4-32; BIA 2016: pages 4-20 through 4-30; BIA 2019a: page 3-3).</p> <p>The types of construction and O&amp;M activities that would be undertaken for the SBSPs would be the same as those analyzed for the four previous solar projects and all the same BMPs are included as part of the SBSPs design features (<b>Appendix B</b>). Exhaust and fugitive dust emissions generated from construction equipment and mobile sources would increase ambient concentrations of regulated air pollutants. Regulated air pollutants for this area include criteria pollutants subject to National Ambient Air Quality Standards under the Clean Air Act. Wind-driven fugitive dust would also be generated from exposed soils disturbed during construction activities and from unpaved roads. Revegetation of areas temporarily disturbed during construction, the use of aggregate in parking areas and internal access roads, and the implementation of dust-control measures would minimize fugitive dust from these sources. O&amp;M of the SBSPs would include combustion emissions from worker commutes, delivery trips, and construction equipment used for maintenance. However, these impacts are anticipated to be well below thresholds that define any noticeable change to local/regional air quality because only five employees would be working onsite regularly and maintenance activities requiring heavy equipment would be infrequent.</p> <p>The Proposed Action would have negligible, short- and long-term, direct and indirect, adverse impacts on air quality during construction and decommissioning of the SBSPs, and negligible, long-term, direct and indirect impacts on air quality during O&amp;M of the solar facilities.</p> <p>There is no potential for new or modified impacts that have not been disclosed in prior environmental documentation. Therefore, this resource topic has been eliminated from further analysis in this EIS.</p>

Resource/Use	Rationale for Not Analyzing in Detail
Areas of Critical Environmental Concern (ACECs)	There are no ACECs in the vicinity of the Project area and the Proposed Action would have no effect on this resource. The nearest ACEC is the Coyote Springs ACEC approximately 6 miles west of the Projects. Therefore, this resource topic has been eliminated from further analysis in this EIS.
BLM-Sensitive Species and Nevada State Listed Species	<p>The SBSPs occur primarily on the Reservation, with a small portion of the Project area (9 acres) occurring outside the Reservation on BLM lands. The only portion of the Projects where protection of BLM-Sensitive Species and Nevada State Listed Species is applicable is on the 9 acres of existing access road and existing gen-tie ROW on BLM lands. An evaluation of the potential for BLM-Sensitive and Nevada State Listed Species to occur within the Project area on BLM-managed lands is provided in <b>Appendix K</b>. The four previous EISs for solar projects on the Reservation analyzed impacts on these species (BIA 2012a: pages 4-50 through 5-60; BIA 2014: pages 4-52 through 4-53; BIA 2016: pages 4-42 through 4-48; BIA 2019a: pages 4-44 through 4-48). However, while these previous projects analyzed impacts associated with construction, O&amp;M, and decommissioning, the Proposed Action for the SBSPs only includes use of and minor maintenance on the existing access roads, including vegetation removal and grading on BLM land, but no expansion or improvements.</p> <p>Traffic along the existing access roads for SBSPs would increase during construction and decommissioning and would increase slightly during O&amp;M. Use of the existing access roads on BLM land, including occasional maintenance of these roadways, is not likely to impact any BLM-Sensitive or Nevada State Listed Species. Implementation of reduced speed limits and other design features and BMPs (<b>Appendix B</b>) and management plans (see Section 2.1.6 and <b>Appendix D</b> through <b>Appendix I</b> and <b>Appendix N</b>) during construction, O&amp;M, and decommissioning would minimize the potential for road kill of sensitive wildlife species. However, increased traffic, particularly during construction, would increase dust and noise along the access roads, though this impact is isolated to a small area of available habitat and short in duration, and therefore negligible. Travel on existing access roads could increase the spread of invasive plant species and noxious weeds which could degrade habitat for wildlife and plant species in adjacent areas. Implementation of the Integrated Weed Management Plan (<b>Appendix E</b>) would minimize the potential for the introduction or spread of invasive plant species and noxious weeds.</p> <p>The Proposed Action would have negligible, localized, short- and long-term, direct and indirect, adverse impacts on BLM-Sensitive and Nevada State Listed plant and wildlife species. Therefore, this resource topic has been eliminated from further analysis in this EIS.</p>
Climate Change	<p>The four previous solar project EISs provide an analysis of potential impacts to climate change associated with the construction, O&amp;M, and decommissioning of a solar facility on the Reservation. Analysis in all four determined that there would be short-term, minor increases in GHGs from construction and decommissioning, with exhaust from construction equipment and vehicles increasing ambient concentrations of GHGs (BIA 2012a: pages 4-4 through 4-7; BIA 2014: pages 4-4 through 4-5; BIA 2016: pages 4-3 through 4-4; BIA 2019a: page 3-4). Since the SBSPs are similar in size and construction duration in comparison to the Southern Paiute Solar Project (K Road), it is expected that construction and decommissioning activities of the SBSPs would result in similar emissions and would generate not more than the 14,899 metric tons/year of carbon dioxide equivalent (CO<sub>2</sub>e) estimated for the Southern Paiute Solar Project (BIA 2012a: pages 4-4 through 4-7).</p> <p>The threshold to require a quantitative assessment is 25,000 metric tons or more of CO<sub>2</sub>e GHG emissions per annum (CEQ 2010). Because GHG emissions for the construction and decommissioning of the SBSPs (14,899 metric tons or less) are anticipated to be less than the 25,000 metric ton reporting minimum, no additional assessment is required (CEQ 2010).</p> <p>O&amp;M of the SBSPs would include combustion emissions from worker commutes, delivery trips, and construction equipment, though this is not expected to be a net increase in comparison to existing conditions. Operational emissions of GHGs are estimated to be less than 1,820 metric tons of CO<sub>2</sub>e over the life of the Projects. However, long-term generation of renewable electricity through solar</p>

Resource/Use	Rationale for Not Analyzing in Detail
	<p>power would have long-term benefits by reducing GHGs associated with energy generation (BIA 2012a: pages 4-24 through 4-26). Therefore, the SBSPs would not result in substantial GHG emissions and would help achieve federal and State goals to reduce GHG emission levels.</p> <p>The Proposed Action would have negligible, short-term, direct and indirect, adverse impacts on climate change resulting from construction, O&amp;M, and decommissioning of the SBSPs. The Proposed Action would have negligible, long-term, direct and indirect, beneficial impacts on climate change from the reduction of primary contributors to GHG emissions offset by the generation of carbon neutral electricity.</p> <p>There is no potential for new or modified impacts that have not been disclosed in prior environmental documentation. Therefore, this resource topic has been eliminated from further analysis in this EIS.</p>
Cultural Resources	See analysis in Section 3.2
Environmental Justice	<p>The tribal members on the Reservation meet the criteria of a minority population and are subject to environmental justice consideration under Executive Order 12898. The four previous solar projects on the Reservation were also subject to environmental justice consideration (BIA 2012a: pages 4-76 through 4-78; BIA 2014: pages 4-89 through 4-92; BIA 2016: pages 4-77 through 4-79; BIA 2019a: page 3-5). Like the four previous solar projects, the proposed SBSPs are being developed by and to benefit the Moapa Band by creating temporary and long-term jobs and would not disproportionately negatively affect the Moapa Band and tribal members. The SBSPs would provide beneficial impacts by creating both jobs and lease revenue for the Moapa Band and tribal members. No displacements or permanent changes in populations would occur.</p> <p>Potential effects from the SBSPs would not result in disproportionately high and adverse human health or environmental effects on minority and/or low-income communities on the Reservation. There is no potential for new or modified impacts that have not been disclosed in prior environmental documentation. Therefore, this resource topic has been eliminated from further analysis in this EIS.</p>
Farmlands (prime or unique)	<p>There are no U.S. Department of Agriculture (USDA)-designated prime or unique farmlands within the Project area. Approximately 34 acres (1 percent) of the SBSP I area is composed of Glendale loam, strongly saline soils, which are classified as a farmland of statewide importance, if irrigated (USDA Natural Resources Conservation Service [NRCS] 2020). However, the area where these soils are found is not currently irrigated, and thus does not qualify as a farmland of statewide importance. Therefore, there would be no impact to protected farmlands, and this resource topic has been eliminated from further analysis in this EIS.</p>
Fire Management	<p>The four previous solar projects on the Reservation provide analysis of potential impacts from fire associated with the construction, O&amp;M, and decommissioning of a solar facility (BIA 2012a: pages 4-100 through 4-102; BIA 2014: pages 4-111 through 4-112; BIA 2016: page 4-96; BIA 2019a: page 3-5). The SBSPs are located on the same sparse vegetation types as the previous solar projects. The Proposed Action would result in similar impacts as those described in previous documentation, which are summarized here.</p> <p>The construction and decommissioning of the SBSPs would result in a short-term increase in the potential for fire ignitions from smoking, refueling, vegetation removal, and operation of vehicles and other equipment. To minimize these impacts, Fire Management Plans would be prepared for each of the Projects and implemented during construction and decommissioning. This plan would include BMPs to minimize and control fire risk as well as describe fire response procedures and safety and fire prevention at the BESS. In addition, a 10-foot-wide firebreak may be established around the outside perimeter of the Projects, and a fire suppression system would be kept at the O&amp;M building and water storage tanks. Thus, these short-term impacts would be negligible.</p>

Resource/Use	Rationale for Not Analyzing in Detail
	<p>The O&amp;M of the SBSPs would result in a long-term increase in the potential for fire ignitions from smoking, vehicles, human traffic, and vegetation trimming, though these impacts would be negligible due to the development and implementation of the Fire Management Plan and establishment of firebreaks and fire suppression systems at each of the Project sites.</p> <p>The Proposed Action would have long-term, beneficial effects during O&amp;M by reducing the potential for wildland fires in the area by reducing some of the fuel source on up to 3,600 acres (2,600 acres for SBSP I and 1,000 acres for SBSP II), where a portion of the vegetation would be trimmed to a height of 18 inches. Although this vegetation would still be capable of carrying fire, intensity would be reduced and any fires that occur would be easier to control.</p> <p>Introduction and spread of invasive plant species and noxious weeds can lead to increased frequency and intensity of wildland fires. To minimize the introduction and spread of weeds, the Projects would implement an Integrated Weed Management Plan, included in <b>Appendix E</b>. In addition, the Projects were designed to maintain soil integrity and minimize grading as much as possible while maintaining less fire-prone native vegetation onsite as much as possible (see the Vegetation analysis in Section 3.6 and the Soils and Invasive Plant Species and Noxious Weeds discussions in this table for more details). Therefore, the Proposed Action would result in negligible, short-term, indirect, adverse impacts associated with a change in vegetation composition, which may result in a change in fire behavior.</p> <p>Fire management for the SBSPs would be similar to the other solar projects on the Reservation. The BLM responds to all wildland fires on both BLM and BIA land, and structure fire response would be covered by Clark County Rural Fire and/or Moapa Fire Protection District. This is because there is no BIA Fire Management Plan or BIA Land Use Plan applicable to the area and the BIA has no wildland fire response resources on the Reservation. The nearest fire station to the Projects is 9 miles to the northeast in the town of Moapa.</p> <p>The Proposed Action would have negligible, short- and long-term, adverse impacts on fire management due to potential sources of ignition, and negligible, long-term, beneficial impacts on fire management during O&amp;M due to fuels reduction and the implementation of the Fire Management Plan. Therefore, this resource topic has been eliminated from further analysis in this EIS.</p>
Floodplains/Flood Hazards	<p>There is a mapped Federal Emergency Management Agency (FEMA)-designated 100-year floodplain within the lease option area associated with California Wash and its tributaries (FEMA Flood Insurance Rate Maps 32003C1050E, 32003C1075E, and 32003C1450E). However, the Projects would be designed to avoid the 100-year floodplain and other major ephemeral drainages within the lease option area.</p> <p>No onsite or offsite facilities would be constructed within the 100-year floodplain. All large ancillary facilities (e.g., O&amp;M building) will be located outside of the ordinary high-water mark of any drainages. Additionally, a buffer around drainages was applied in consultation with hydrology experts such that all the Project features in the Proposed Action were designed and located to meet the drainage needs of the site and minimize grading during site preparation. Some PV supports could be placed within ungraded drainages where technically feasible. Although no road crossings would be constructed within the designated 100-year floodplain, crossings in other drainages would be designed to meet standards for low-water crossings within floodplains. Additionally, the crossings would be designed to allow surface waters to flow unimpeded over the crossing. Temporary disturbance in drainages would also occur from trenching across drainages for underground collector line installation.</p> <p>A hydrology report (Westwood 2019) was prepared which modeled flood depths in the Project area and Project infrastructure was designed in consultation with hydrology experts to protect infrastructure for the life of the Projects and in accordance with local, State, and federal standards. A number design features and BMPs (<b>Appendix B</b>) would be implemented to manage stormwater runoff and erosion in the Project area, which could otherwise have downstream effects on</p>

Resource/Use	Rationale for Not Analyzing in Detail
	<p>floodplains. With the implementation of these design features and BMPs, the Proposed Action would not lead to the adverse modification of any floodplains or increased flood hazards. Therefore, the Proposed Action would have negligible, short- and long-term, direct and indirect, adverse impacts on floodplains and flood hazards, and this resource topic has been eliminated from further analysis in this EIS.</p>
Forest Resources	<p>The Project area is dominated by open stands of creosotebush and white bursage with various species of cacti, yucca, annual and perennial herbaceous plants, and grasses interspersed. These plants are not considered to be forest resources by the BIA and Moapa Band, so this topic would not apply to the portions of the Project on Reservation land and Reservation land managed by BLM. The access road section on BLM land does not contain forests or woodlands so no impact to this resource would result from implementation of the Proposed Action. Therefore, this resource topic has been eliminated from further analysis in this EIS.</p>
General Wildlife	<p>The Southern Paiute Solar Project (BIA 2012a: pages 4-46 through 4-49), MSEC (BIA 2014: pages 4-48 through 4-52), Aiya (BIA 2016: pages 4-44 through 4-48), and ESMSP (BIA 2019a: pages 3-38 through 3-40) EISs provide analysis of potential impacts to general wildlife species from construction, O&amp;M, and decommissioning of solar facilities on the Reservation. The Proposed Action would result in similar impacts as those described in previous documentation, which are summarized here.</p> <p>Ground-disturbing activities during construction, O&amp;M, and decommissioning of the SBSPs would result in direct mortality, altered foraging and breeding behavior, abandonment of habitat, and avoidance behaviors. Increased noise and human presence could result in short-term, direct impacts to wildlife by causing wildlife to alter foraging and breeding behavior. Loss of burrows due to construction, ground vibration, or avoidance behavior would cause wildlife to search for and/or dig new burrows. These impacts would be minimized by implementation of design features and BMPs (<b>Appendix B</b>) and management plans (see Section 2.1.6 and <b>Appendix D</b> through <b>Appendix I</b>), which include biological monitoring during ground-disturbing activities and vegetation treatments and implementation of a Worker Environmental Awareness Program and worker training. Direct impacts to wildlife from hazardous waste, such as poisoning, injury, or mortality, would be minimized through implementation of procedures for containment and disposal of hazardous waste as will be outlined in the Spill Prevention and Emergency Response Plan. Therefore, direct effects to general wildlife would be negligible.</p> <p>Removal and modification of vegetation within the solar fields, new access roads, and collector line ROWs would reduce forage, shelter, and nesting opportunities. The permanent disturbance of 794 acres of habitat (501 acres for SBSP I and 297 acres for SBSP II, of which 4 acres are shared by both Projects) could cause wildlife to rely more heavily on habitat in the surrounding areas. The area of permanent impact for the Projects is relatively small and is not expected to result in any change in habitat availability or cause habitat fragmentation in comparison to existing conditions. Permanent disturbance to habitat would result in a negligible, long-term, indirect, adverse impact on general wildlife. Following decommissioning, these disturbed areas would be revegetated, which would minimize the long-term impacts to general wildlife species and their habitats.</p> <p>Following construction, the regrowth of 2,871 acres of temporarily impacted vegetation (2,141 acres for SBSP I and 731 acres for SBSP II) would allow for many species to utilize the solar fields during O&amp;M, resulting in a negligible, long-term, direct, beneficial impact on general wildlife. The increase in perches for avian predators such as ravens and raptor species could increase the risk of predation to prey species, but the use of perch deterrents would minimize this impact.</p> <p>With the implementation of design features and BMPs (<b>Appendix B</b>), the Proposed Action would result in negligible, localized, short- and long-term, direct and indirect, adverse impacts on general wildlife. Therefore, this resource topic has been eliminated from further analysis in this EIS.</p>

Resource/Use	Rationale for Not Analyzing in Detail
Hunting, Fishing, and Gathering	No hunting, fishing, or gathering has been reported or documented by the Moapa Band in the vicinity, and no impact to these activities would result from implementation of the Proposed Action. Therefore, this resource topic has been eliminated from further analysis in this EIS.
Indian Trust Assets	Like the four previous solar projects, the SBSPs would have impacts on Reservation lands, such as vegetation removal and soil disturbance from grading during construction. Indian Trust Assets, such as fishing rights and minerals, would not be impacted by implementation of the Proposed Action, as described in the previous EISs (BIA 2012a: pages 4-78 through 4-79; BIA 2014: page 4-94; BIA 2016: page 4-79; BIA 2019a: page 3-6). The SBSPs’ proposed use of tribal water would exercise the Moapa Band’s water rights, which would demonstrate the Moapa Band’s legitimate need for these water rights. This would support the Moapa Band against any adverse claims by others in the future. Since the Proposed Action would not impact Indian Trust Assets, this resource topic has been eliminated from further analysis in this EIS.
Invasive Plant Species and Noxious Weeds	<p>The four previous solar EISs—Southern Paiute Solar Project (BIA 2012a: pages 4-41 through 4-45), MSEC (BIA 2014: pages 4-41 through 4-45 and BIA 2020c: pages 3-13 through 3-19), Aiya (BIA 2016: pages 3-37 through 3-42), and ESMSP (BIA 2019a: page 3-7)—provide analysis of potential impacts and mitigation for invasive plant species and noxious weeds during the construction, O&amp;M, and decommissioning of a solar facility. The proposed location for the SBSPs is within the same vegetation types and has the potential to encounter the same weed species (including Sahara mustard) as the previous projects, as summarized here.</p> <p>Invasive plant species and noxious weeds could be transported to the Project area by construction vehicles (if not properly cleaned), erosion control materials such as hay bales and straw wattles, and by invasion from adjacent lands via natural movement such as wind. Existing populations of invasive plant species and noxious weeds could be spread during O&amp;M by trimming of vegetation and vehicle use in and out of the Project area. Invasive plant species and noxious weeds could out-compete native plants for resources (such as space and water), adversely affecting native vegetation and increasing erosion potential over the short-term during construction and decommissioning, and over the long-term during O&amp;M of the SBSPs. Treatment of invasive plant species and noxious weeds could inadvertently result in mortality and injury to native plant species.</p> <p>To minimize the potential for the introduction and spread of invasive plant species and noxious weeds, a draft Integrated Weed Management Plan (<b>Appendix E</b>) has been prepared for the SBSPs, which includes BMPs, such as control of established invasive plant species and noxious weeds using herbicide and mechanical treatments, use of weed-free erosion control materials, and washing of construction and decommissioning vehicles. This Plan includes monitoring for weeds within all surface disturbance areas of the Projects, such as the areas requiring grading and where underground collector lines would be installed. The risk of introduction and spread of invasive plant species and noxious weeds is slightly greater during construction than during O&amp;M and decommissioning due to the increased human presence and vehicles traveling into and out of the Project area during construction.</p> <p>With the implementation of design features and BMPs (<b>Appendix B</b>) and the Integrated Weed Management Plan (<b>Appendix E</b>), the Proposed Action would result in minor, short-term, direct and indirect, adverse impacts associated with introduction and spread of invasive plant species and noxious weeds during construction, and negligible long-term, direct and indirect, adverse impacts during O&amp;M and decommissioning. Therefore, this resource topic has been eliminated from further analysis in this EIS.</p>
Lands and Realty	The solar fields would be constructed on Reservation land. A portion of the ROWs for the collector lines would be on Reservation land within the BLM-managed designated utility corridor, and the remaining portion of the ROWs for the collector lines would be on the Reservation. The ROW necessary for access to the gen-tie line connecting the Project substations to the Reid Gardner substation would also be on Reservation land within the BLM-managed designated utility corridor, as

Resource/Use	Rationale for Not Analyzing in Detail
	<p>well as BLM-administered lands, and private lands owned by NV Energy. These lands are vacant and surround lands currently used by the Moapa Band for an existing solar facility (the Southern Paiute Solar Project). The SBSPs are bordered by the Union Pacific railroad to the east and south as well as the BLM-managed designated utility corridor to the west. The SBSPs are in an area designated by the Moapa Band for economic development, and the gen-tie route is located within the BLM-managed designated utility corridor set aside for this specific purpose.</p> <p>Additional discussion regarding adjacent land uses and existing leases and ROWs, as well as potential impacts, are discussed in three of the previous solar EISs: Southern Paiute Solar Project (BIA 2012a: pages 3-66 through 3-70 and pages 4-79 through 4-81), MSEC (BIA 2014: pages 3-58 through 3-59 and pages 4-92 through 4-95; and BIA 2020c: pages 3-29 to 3-30), and the ESMSP (BIA 2019a: pages 3-58 through 3-60).</p> <p>The SBSPs would be consistent with federal, State, and local land-use plans and policies, existing BLM land-use authorizations, and public land disposition, and would not require any land tenure adjustments. The SBSPs would meet the desired purpose indicated by the Moapa Band for the use of the land which was specifically set aside for these Projects. There is no potential for new or modified impacts that have not been disclosed in prior environmental documentation. Therefore, this resource topic has been eliminated from further analysis in this EIS.</p>
Lands with Wilderness Characteristics	<p>There are no lands with wilderness characteristics within or near the Project area, and no impact to this resource would result from implementation of the Proposed Action. Therefore, this resource topic has been eliminated from further analysis in this EIS.</p>
Lifestyle and Cultural Values	<p>No hunting, fishing, or gathering has been reported by the Moapa Band in this portion of the Reservation. Solar projects have been determined by the Moapa Band to offer an opportunity to expand economic development on the Reservation while upholding tribal values of respect and care for tribal land.</p> <p>The project would not preclude tribal members from accessing any on- or off-Reservation residences, amenities, or places of work. Therefore, implementation of the Proposed Action would not impact this resource topic and it has been eliminated from further analysis in this EIS.</p>
Livestock Grazing	<p>There are no grazing allotments reported by the Moapa Band in this portion of the Reservation. No grazing occurs within the Project area and no impact to this resource would result from implementation of the Proposed Action. Therefore, this resource topic has been eliminated from further analysis in this EIS.</p>
Migratory Birds	<p>See analysis in Section 3.3</p>
Minerals	<p>On tribal lands, the SBSPs would not be in an area identified by the Moapa Band for mineral development and would have no effect on mineral exploration, mining, leasing, or mineral material sales on the Reservation. The small amount of BLM and private land at the northern end of the gen-tie line has saleable minerals present but no construction or ground disturbance is necessary in this location; all required infrastructure for the gen-tie line, access, and maintenance roads are existing. If any excess mineral materials are generated by Project implementation, the minerals would stay within and would be utilized within the ROW. Therefore, implementation of the Proposed Action would not impact this resource topic and it has been eliminated from further analysis in this EIS.</p>
Native American Religious Concerns	<p>The BIA coordinated with the Moapa Band to arrange appropriate cultural resources survey methods and to provide for tribal members to accompany the archaeologists during the survey efforts that were conducted for the Projects. In addition, the BIA sent letters to eight tribes in the region with traditional interests in the area inquiring if there were any concerns about the effects of the proposed Projects on historic properties or areas of traditional or cultural importance. These tribes included the Las Vegas Paiute Tribe, Kaibab Band of Paiute Indians, Hualapai Indian Tribe, Fort</p>

Resource/Use	Rationale for Not Analyzing in Detail
	<p>Mojave Indian Tribe, Hopi Tribe, Colorado River Indian Tribes, Chemehuevi Indian Tribe, and Paiute Indian Tribe of Utah (<b>Appendix L</b>).</p> <p>The analysis in the four previous solar EISs concluded that there are no identified Native American religious concerns in or near the Project area that would be impacted by the construction, O&amp;M, and decommissioning of a solar facility. Since no sensitive Native American religious concerns would be adversely impacted, no measures to minimize or avoid adverse impacts were required (BIA 2012a: pages 3-53 through 3-54 and pages 4-61 through 4-64; BIA 2014: pages 3-46 through 3-47 and pages 4-76 through 4-79; BIA 2016: pages 3-46 through 3-51 and pages 4-65 through 4-68; BIA 2019a: page 3-51).</p> <p>Similarly, the Project area contains numerous cultural features that contribute to the history and the long-term use of this region by the Southern Paiutes and, specifically, the Moapa Band. They have a deeply rooted spiritual connection to the land that weaves stories and songs into the landscape, connecting all elements of the universe. These connections involve water, trails, flora, fauna, geographic structures, and spiritual, historical, and ceremonial events. Through coordination and consultation, no specific concerns have been raised by the Moapa Band and other tribes regarding traditional cultural properties (TCPs) or other religious issues. Therefore, this resource topic has been eliminated from further analysis in this EIS.</p>
Noise	<p>The four previous solar EISs provide a detailed analysis of potential noise impacts associated with the construction, O&amp;M, and decommissioning of a solar facility on this area of the Reservation. These analyses indicated that there are no sensitive human receptors near the area that would be adversely impacted by noise from short-term construction or long-term O&amp;M of a solar facility, and no measures to minimize or avoid adverse impacts were required (BIA 2012a: pages 4-32 through 4-39; BIA 2014: pages 4-33 through 4-38; BIA 2020c: pages 3-11 through 3-12; BIA 2016: pages 4-30 through 4-35; BIA 2019a: page 3-8).</p> <p>The Project area is in undeveloped terrain in a remote area west of I-15 adjacent to one previously constructed solar project (Southern Paiute Solar Project) and one solar project that is currently under construction (ESMSP). There are no nearby identified sensitive noise receptors. The nearest residential noise receptors are located approximately 8.5 miles northeast of the Project area. Noise from the SBSPs would be generated primarily by equipment and vehicles during construction and decommissioning, but these impacts would be short-term and negligible. Noise from the SBSPs during O&amp;M would be long-term but negligible. The rugged topography of the surrounding landscape would further minimize potential effects from noise. There is no potential for new or modified impacts that have not been disclosed in prior environmental documentation. Therefore, this resource topic has been eliminated from further analysis in this EIS.</p>
Paleontological Resources	<p>The four previous solar EISs determined that paleontological materials are unlikely to exist in the Project area, which is categorized as having a low potential for paleontological resources (BIA 2012a: page 3-9; BIA 2014: page 3-5; BIA 2016: page 3-6; BIA 2019a: page 3-8). The previous projects, like the SBSPs, are located in Quaternary alluvium deposited by flowing water (Stewart and Carlson 1978). These analyses indicated that potential paleontological materials are unlikely to exist in the alluvial deposits, and the Project area is also categorized as having low potential for paleontological resources. Therefore, no impact to this resource is anticipated from implementation of the Proposed Action and this resource topic has been eliminated from further analysis in this EIS.</p>
Public Health and Safety	<p>Potential impacts to public health and safety from development of solar projects on the Reservation were analyzed in the Southern Paiute Solar Project (BIA 2012a: pages 4-95 through 4-102), MSEC and the ACSP Supplemental EIS (BIA 2014: pages 4-107 through 4-112; BIA 2020c: pages 3-36 through 3-38), and Aiya (BIA 2016: pages 4-92 through 4-96) EISs. Potential health and safety impacts could result from improper handling and storage or inadvertent spills of hazardous materials, ground disturbance in sites with known or unknown contaminants, electrical hazards, and fire hazards.</p>



Resource/Use	Rationale for Not Analyzing in Detail
	<p>The SBSPs would be designed and constructed in accordance with all relevant federal and industrial standards, as well as State, tribal, and local codes, as applicable. Several plans would be developed and implemented consistent with these standards and codes, which would minimize risks to workers and the public (some draft plans are available in <b>Appendix D</b> through <b>Appendix I</b>, while some plans would be developed by the Applicants prior to Project construction). These include a SWPPP, Hazardous Materials and Waste Management Plan, Spill Prevention and Emergency Response Plan, Fire Management Plan, and Decommissioning Plan. All workers would also be required to adhere to a health and safety program. With the implementation of design features and BMPs (<b>Appendix B</b>), the potential risk to worker and public health during construction, O&amp;M, and decommissioning of the SBSPs would be minimal.</p> <p>The SBSPs would be constructed in an undeveloped area with no known sources of prior contamination that could pose a risk to public health. However, the SBSPs would be constructed in an area where <i>Coccidioides immitis</i>, the fungus that causes Valley Fever, may be present in the soil (Centers for Disease Control and Prevention 2020). Fugitive dust generated by the Proposed Action may increase the risk to workers and the public from exposure to the fungus. Dust-control and other measures would be implemented to minimize the risk of exposure.</p> <p>With the implementation of design features and BMPs (<b>Appendix B</b>) such as the use of personal protection equipment and implementation of dust suppressant techniques during construction and maintenance, the Proposed Action would have negligible, short- and long-term, adverse impacts on public health and safety. Therefore, this resource topic has been eliminated from further analysis in this EIS.</p>
Recreation	<p>Public recreation does not occur on the Reservation in or near the area the SBSPs and collector lines would occupy, nor on the small amount of BLM lands in the access road and gen-tie corridors. The BLM roads that would be used to access the SBSPs may provide access to areas used by the public for recreation. These roads would remain open to the public, though users may experience brief delays during construction due to increased traffic. Therefore, the Proposed Action would have a negligible effect on recreation, and this resource topic has been eliminated from further analysis in this EIS.</p>
Socioeconomic	See analysis in Section 3.4
Soils	<p>Soils in the SBSPs fall within five soil series classification as defined by the USDA NRCS, with two soil classifications (Bard gravelly fine sandy loam and Badland) making up over 90 percent of the Project area (USDA NRCS 2020). The Southern Paiute Solar Project is adjacent to the SBSPs and contains the same soil classifications as those found in the SBSPs (BIA 2012a). Additionally, the MSEC also contains some of the same soils as the SBSPs (BIA 2014 and BIA 2020c). The three previous EISs evaluated the potential impacts to these soils from the construction, O&amp;M, and eventual decommissioning of the solar facilities (BIA 2012a: pages 4-11 through 4-13; BIA 2014: pages 4-9 through 4-12; BIA 2020c: pages 3-5 through 3-6). The previous evaluations looked at the soil characteristics and evaluated the soil erosion rates from wind and water, soil productivity, and potential for contamination.</p> <p>Approximately 794 of the 3,600 acres within the two lease option areas would be permanently cleared, graded, and/or disturbed (501 acres for SBSP I and 297 acres for SBSP II with 4 acres shared by both Projects). Vegetation on the remainder of the solar fields (2,141 acres for SPBSP I and 731 acres for SBSP II) would be driven over and crushed or trimmed, thereby leaving soil intact, whereas grading would result in loosening and exposure of bare soil. In addition to impacts to soils, the SBSPs would have long-term impacts on areas where biocrust and desert pavement are present, which would affect the soil stabilization benefits they provide. The potential for wind and water erosion would be increased by soil disturbance during construction and decommissioning, resulting in potential adverse impacts. Rather than graded, vegetation in the solar fields would be trimmed, leaving roots intact, which would minimize the potential for erosion. To reduce the potential for water erosion, the Applicants would develop a Site Drainage Plan as part of the final Project design. The drainage plan would incorporate existing, natural offsite washes to allow the stormwater flow to</p>

Resource/Use	Rationale for Not Analyzing in Detail
	<p>pass through the site naturally. Any onsite drainage control features would be implemented to dissipate flow and minimize scouring and erosion. These features would be designed to protect the integrity of existing drainages and not channelize flows within the site.</p> <p>With the implementation of design features and BMPs (<b>Appendix B</b>) to prevent potential increases in soil erosion and sedimentation, including physical soil stabilization and revegetation as outlined in applicable plans (e.g., Site Restoration Plan, SWPPP, and drainage plan), impacts to soils would be minimized. Therefore, the Proposed Action would have minor, localized, short- and long-term, adverse effects on soils, and this resource topic has been eliminated from further analysis in this EIS.</p>
Threatened and Endangered Species	See analysis in Section 3.5
Timber Harvesting	The Project area does not contain forests or woodlands that could be harvested for timber, and no impact on this resource would result from implementation of the Proposed Action. Therefore, this resource topic has been eliminated from further analysis in this EIS.
Topography/ Geology	<p>The proposed SBSPs would be graded only where necessary. Grading for the Projects would include up to 400 acres for SBSP I and 245 acres for SBSP II. Contour changes would be minor and would not lead to long-term effects on local topography or drainage. Although the site is located on a mesa where sediments have the potential for movement during large precipitation events, the Projects would be constructed to minimize that potential movement by using the natural onsite drainage. It is not likely that the geologic unit would become unstable as a result of the Projects. Because the Projects would not create subterranean void spaces, the Projects would not increase the geologic instability of the area and would not increase the risk of onsite or offsite landslides, lateral spreading, subsidence, liquefaction, or collapse.</p> <p>The Project area has moderate to high potential for strong earthquake shaking, but all proposed structures would comply with applicable seismic building codes, reducing the potential for earthquake-related structural damage to the Projects.</p> <p>No impact to this resource would result from implementation of the Proposed Action. Therefore, this resource topic has been eliminated from further analysis in this EIS.</p>
Traffic/ Transportation	<p>Access to the SBSPs would be via the same roads/routes evaluated for previous solar EISs including the Southern Paiute Solar Project (BIA 2012a), MSEC (BIA 2014), and ESMSP (BIA 2019a). The previous solar EISs provide an analysis of the types and timing of traffic expected and the potential impacts of this traffic on the local roads that would provide primary access (such as I-15, US 93, and North Las Vegas Boulevard) and that would be used during the construction, O&amp;M, and decommissioning of the PV solar facility and gen-tie on the Reservation in this area. It was determined that traffic impacts would occur primarily during construction and would result in short-term adverse effects on traffic volume but would not adversely affect traffic flow on local roadways.</p> <p>During construction for the SBSPs, the anticipated traffic volumes and movement of equipment are expected to be the same or similar to what was evaluated in the previous EISs for the Southern Paiute Solar Project (BIA 2012a: pages 4-95 through 4-102), MSEC (BIA 2014: pages 4-107 through 4-112), and ESMSP (BIA 2019a: pages 3-10 and 3-11). Construction workers and the construction equipment are not anticipated to exceed what was necessary for the previous projects and therefore the SBSPs are expected to result in minor, short-term effects on the volume of traffic on access routes. The implementation of the SBSPs would not result in road closures or detours. With the implementation of design features and BMPs (<b>Appendix B</b>), the construction of the SBSPs are not expected to adversely affect traffic flow on local roadways or at intersections even during peak construction. The existing vehicle traffic on these routes is well below their engineered capacity and can accommodate the expected increase in traffic (refer to <b>Appendix G</b>). During O&amp;M, only five full-time equivalent workers would be employed at each facility and, therefore, there would be negligible impacts on traffic volumes. Impacts during decommissioning would be similar to, but less than, those</p>

Resource/Use	Rationale for Not Analyzing in Detail
	<p>from construction. Impacts to motorists on BLM-managed roads open to the public are discussed under the recreation section of this table.</p> <p>In addition, the roads that would be used to access the SBSPs were upgraded during development of the existing Southern Paiute Solar Project and the ongoing construction of ESMSP, so no additional upgrades are required for implementation of the SBSPs. A Traffic Management Plan (<b>Appendix G</b>) for the SBSPs outlining methods to reduce traffic impacts would be developed prior to and implemented during construction. The implementation of the SBSPs is anticipated to result in minor, short-term, adverse impacts, and negligible, localized, long-term, adverse impacts on traffic/transportation resources. Therefore, this resource topic has been eliminated from further analysis in this EIS.</p>
Vegetation	See analysis in Section 3.6
Visual Resources	See analysis in Section 3.7
Wastes (Hazardous or Solid)	<p>As part of the analysis on public health and safety, the Southern Paiute Solar Project (BIA 2012a: pages 4-98 through 4-102), MSEC (BIA 2014: pages 4-109 through 4-112), and Aiya (BIA 2016: pages 4-94 through 4-96) EISs provide a detailed analysis of potential impacts from hazardous materials associated with the development of a solar facility on the Reservation, which are summarized here.</p> <p>Potential impacts could result from improper storage and handling or inadvertent spills of hazardous materials. Hazardous materials associated with the Proposed Action include gasoline, diesel fuel, oil, hydraulic fluids and lubricants, paints, solvents, adhesives, batteries, welding materials, and mineral oil for transformers. Localized spills and leaks of hazardous materials from equipment, storage sites, or vehicles/equipment could occur as a result of improper handling or storage, which could result in exposure to humans or local wildlife. The risk of spills and leaks would be greatest during construction and decommissioning due to the heavy equipment and construction materials associated with these phases. A minimal amount of potentially hazardous materials would be stored or used onsite during O&amp;M, and there would be much fewer vehicles in use than during construction and decommissioning.</p> <p>Several design features and BMPs (<b>Appendix B</b>) have been incorporated into the Proposed Action to minimize the potential impacts from hazardous wastes, including recycling of materials when possible and proper offsite disposal of materials that cannot be recycled. Procedures for proper storage, handling, and disposal of hazardous materials would be detailed in a Spill Prevention and Emergency Response Plan, and Decommissioning Plan (<b>Appendix F</b>) for the Projects. A Hazardous Materials and Waste Management Plan would also be prepared prior to implementation of the Projects.</p> <p>With the implementation of design features and BMPs (<b>Appendix B</b>), the Proposed Action would have a negligible, localized, short- and long-term, adverse effect associated with hazardous wastes. Therefore, this resource topic has been eliminated from further analysis in this EIS.</p>
Water Resources (Surface/Ground)	<p>The Southern Paiute Solar Project (BIA 2012a: pages 4-14 through 4-20), MSEC and ACSP supplemental EIS (BIA 2014: pages 4-12 through 4-22; BIA 2020c: pages 3-6 through 3-7), Aiya (BIA 2016: pages 4-12 through 4-20), and ESMSP (BIA 2019a: pages 3-16 through 3-20) EISs provide analysis of potential impacts to water resources associated with the development of a solar facility on the Reservation, which are summarized here.</p> <p>Potential impacts include reductions in the availability of groundwater, contamination of ground and/or surface water, and increased risk of flooding hazards. Water for the SBSPs would be obtained from an existing well pursuant to existing water rights on the Reservation. The Moapa Band is permitted to withdraw 2,500 AFY, which is more than adequate for the 400 AF that would be required for construction (200 AF for each Project) and the 40 AFY needed during O&amp;M (20 AFY for each Project). An updated analysis of groundwater in the local basin is provided in Order #1309 issued on June 15, 2020 (Wilson 2020). In this order, it is acknowledged that there is some uncertainty regarding the quantity of groundwater that can be sustainably pumped, based on the</p>

Resource/Use	Rationale for Not Analyzing in Detail
	<p>Nevada State Engineer's findings on the Lower White River Flow System (LWRFS). Order #1309 sets the maximum quantity of groundwater that may be pumped from the LWRFS without causing further declines as 8,000 AFY. The order finds that "the current data are adequate to establish an approximate limit on the amount of pumping that can occur within the system, but that continued monitoring of pumping, water levels, and spring flow is essential to refine and validate this limit." The Moapa Band is permitted to withdraw 2,500 AFY, which is within the maximum limits identified in the order. Therefore, there would be no impact to the availability of groundwater in the region. Improper storage and handling of hazardous materials could lead to leaks or spills that may contaminate ground and/or surface water in the vicinity of the SBSPs. Design features and BMPs (<b>Appendix B</b>) incorporated in the Proposed Action, and the implementation of a Hazardous Materials and Waste Management Plan and Spill Prevention and Emergency Response Plan, which would be developed prior to Project implementation, would minimize the risk of impacts to ground and/or surface water quality. Erosion from areas disturbed during construction could contaminate surface waters; however, this impact would be minimized through the implementation of a SWPPP for each Project.</p> <p>The SBSPs have been designed to avoid construction within floodplains and the largest washes in the area. A hydrology report (Westwood 2019) has been prepared and the Projects will be designed to allow all surface flows upstream of the site to flow to the ephemeral drainages downstream of the site. A new rule redefining waters of the U.S. (WOUS) went into effect on June 22, 2020. Under this new rule, "ephemeral features that flow only in direct response to precipitation, including ephemeral streams..." are excluded from the definition of WOUS. This reaffirms that site drainages would not be potentially jurisdictional and therefore a jurisdictional delineation has not been completed for the Projects. In addition, overall drainage patterns onsite would be maintained, and this would help minimize the loss/disturbance of these drainages, maintain drainage functions, and reduce erosion and sedimentation impacts during and following construction. Access road wash crossings would also be constructed to allow stormwater flows to flow unimpeded across them.</p> <p>With the implementation of design features and BMPs (<b>Appendix B</b>), the Proposed Action would have minor, regional, short- and long-term, direct and indirect, adverse impacts on water resources. Therefore, this resource topic has been eliminated from further analysis in this EIS.</p>
Wetlands/ Riparian Zones	<p>As part of the water resources analysis, the Southern Paiute Solar Project (BIA 2012a: pages 4-22 through 4-23), MSEC (BIA 2014: page 4-21), Aiya (BIA 2016: pages 4-18 through 4-20), and ESMSP (BIA 2019a: pages 3-19 through 3-20) EISs provide analysis of potential impacts to wetlands and riparian areas associated with the development of a solar facility on the Reservation, which are summarized here.</p> <p>No wetlands or riparian areas have been identified within the SBSPs. The solar field lease areas (area within the fenceline) would exclude the largest drainages in the lease option area, and no facilities would be constructed within the 100-year floodplain. The remaining washes within the solar field lease areas support a limited amount of xeroriparian vegetation. No grading or construction of ancillary facilities (e.g., O&amp;M building) would occur within these drainages; however, some PV supports may be placed within ungraded drainages, where technically feasible. Access roads and collector lines may need to be constructed across drainages in some locations. Due to the limited number and small size of these drainage crossings, impacts to xeroriparian zones would be minimal. Additionally, drainage plans and BMPs would be implemented to minimize potential effects to drainages from altered stormwater flows, erosion, and sedimentation.</p> <p>Therefore, with the implementation of design features and BMPs (<b>Appendix B</b>), the Proposed Action would have a negligible effect on riparian zones, and this topic has been eliminated from further analysis in this EIS.</p>
Wild and Scenic Rivers	<p>There are no Congressionally designated Wild and Scenic Rivers within or immediately adjacent to the Project area, and no impact to this resource would result from implementation of the Proposed Action. The nearest Wild and Scenic Rivers are the Virgin River to the east and the Amargosa River to</p>

Resource/Use	Rationale for Not Analyzing in Detail
	the west, both approximately 90 miles from the Projects. Therefore, this resource topic has been eliminated from further analysis in this EIS.
Wilderness/ Wilderness Study Areas	There are no wilderness or wilderness study areas within or near the Project area, and no impact to this resource would result from implementation of the Proposed Action. The nearest wilderness area is the Mount Wilson Wilderness Area approximately 35 miles south of the Projects. Therefore, this resource topic has been eliminated from further analysis in this EIS.
Wild Horse and Burros	Wild horses and burros are not found in the Project area. The nearest Herd Management Area (HMA), the Muddy Mountain HMA, is approximately 10 miles southeast of the SBSPs. The Red Rock and Wheeler Pass HMAs are located approximately 30 miles southwest of the SBSPs, and the Gold Butte HMA is located approximately 25 miles southeast of the SBSPs. No impact to this resource would result from implementation of the Proposed Action. Therefore, this resource topic has been eliminated from further analysis in this EIS.

## 3.2 Cultural Resources

The classification of a “cultural resource” for purposes of this EIS includes all districts, sites, buildings, structures, objects, and landscapes that have been created by or are associated with humans and are considered to have historical or cultural value. This section of the EIS discusses the presence of cultural resources within the Project area and the impacts that the Proposed Action and the No Action Alternative would have on those resources. The analysis area consists of the area of potential effect (APE), which is the geographic area or areas in which cultural resources may be affected by the SBSPs. The APEs for the SBSPs were defined by the BIA in consultation with the Nevada State Historic Preservation Office (SHPO) and other consulting parties.

### 3.2.1 Cultural History

Prehistoric sites across the Great Basin and the greater American Southwest exhibit the presence of humans during the late Pleistocene, 15,000 years ago. Around 1,500 years ago, the Ancestral Puebloan inhabitants of the greater southwest came into the vicinity. There is clear evidence of Southern Paiute people in the vicinity of the proposed SBSPs by at least 850 years ago. Historically, the area was settled by Mormon farmers and ranchers in the 1800s.

### 3.2.2 Affected Environment

#### AREA OF POTENTIAL EFFECTS

The direct APE for physical effects applies to all land ownership types within the Project area. The indirect APE or APE for visual effects is defined as areas visible within 5 miles of any Project component or to the visual horizon, whichever is closer. The APE for visual effects is based upon the method of subdividing landscapes for visual resource inventories into three distance zones based upon relative visibility of project components: foreground/midground, background, and seldom seen. The foreground/midground extends between 3 and 5 miles from the Project area and is where Project components might be seen in detail. Outside of 5 miles, the details, texture, and form are no longer as apparent and, in some cases, atmospheric conditions can reduce visibility (BLM 1984).

Within the APE for visual effects, archaeological sites that are significant only for their potential to yield important information generally would not be affected by changes to their visual setting, but setting might be an important element of the historical values of other types of resources, such as historic trails and roads, historic buildings and structures, and traditional cultural properties (TCPs).

The BIA consulted with the SHPO regarding the direct and indirect APE in a letter dated June 2, 2020. The SHPO agreed that the APE under consideration for the SBSPs is in keeping with 36 CFR § 800.4(a)(1) and 36 CFR § 800.16(d) in a letter dated July 1, 2020 (**Appendix L**).

## RESULT OF LITERATURE REVIEW AND FIELD INVESTIGATION

An archival records search was conducted through the Nevada Cultural Resources Information System, the Nevada SHPO, and the Southern Nevada Archaeological Archive database. These background and records searches were completed for the direct and indirect APE. A Class III systematic pedestrian survey was also completed for the SBSPs and covered a total of approximately 189 square miles (7,112 acres). The survey was documented in the report entitled, *Class III Cultural Resource Inventory of Approximately 7,112 Acres for the Southern Bighorn Solar Projects, Near Crystal, Clark County, Nevada* (BIA 2020e). The pedestrian survey area included the approximate 6,500-acre lease option area and areas beyond the lease option boundary at the request of the Moapa Band.

As a result of the literature review and field investigations for the SBSPs, a total of 112 surveys have been completed in the Project vicinity. A total of 199 sites have been previously identified in the SBSPs direct and indirect APE. Of the 199 identified sites only 3 are recorded within or transect the direct APEs (refer to **Table 3-2**), and the remaining sites are in the indirect APE.

**Table 3-2. Cultural Resources Within or Intersecting the Direct APE**

Site Number	Age/Era	Site Type	Eligibility (Criteria)
26CK3536/ 26CK3848/ Old Spanish Trail/ Mormon Wagon Road	Historic	Route	Listed (A, D): elements in direct APE are non-contributing
26CK10795	Historic	Trash	Not eligible
26CK4585 <sup>1</sup>	Prehistoric	Lithic	Not eligible

<sup>1</sup> Site 26CK4585 is a previously recorded isolated, bifacial tool. At the time it was recorded, the site was determined to be ineligible for the NRHP. Despite considerable effort, the recent survey was unable to relocate the artifact.

Of the remaining 196 previously recorded cultural resources, 49 have been previously determined ineligible for inclusion in the National Register of Historic Places (NRHP), identified as non-contributing elements of historic properties, or have been excavated professionally. The remaining 147 resources were subjected to a geographic information system-based viewshed analysis. Based on the review, the BIA identified 6 previously recorded sites for visitation and indirect effects assessment, and a member of the Moapa Band suggested 1 additional site be revisited as well (26CK10796). The 7 resources requiring visitation are listed in **Table 3-3**.

Of these seven sites revisited, four are considered eligible under criteria A and D for the NRHP with contributing and non-contributing components, one is listed on the NRHP under A and D with contributing and non-contributing components, one is recommended eligible under criterion D, and one is unevaluated and therefore treated as eligible.

**Table 3-3. Sites Visited for Indirect Effects Assessment**

Site Number	Site Name or Type	Age/Era	Eligibility (Criteria)
26CK3536 <sup>1</sup>	Old Spanish Trail / Mormon Wagon Road	Historic	Listed (A, D) <sup>2</sup>
26CK4348	Tiffany Mill Site	Historic	Eligible (A, D)
26CK4429 <sup>1</sup>	San Pedro, Los Angeles, and Salt Lake Railroad	Historic	Eligible (A, D) <sup>2</sup>
26CK4958 <sup>1</sup>	Arrowhead Highway <sup>1</sup>	Historic	Eligible (A, D)
26CK5019	Railroad construction camp	Historic	Eligible (A, D)
S2160	Microwave tower	Historic	Treated as eligible
26CK10796	Rockshelter, trail	Prehistoric	Eligible (D)

<sup>1</sup> Additional site numbers and/or names may also be assigned.

<sup>2</sup> Some individual segments have been determined contributing to the structure's overall eligibility, while others have been determined noncontributing, and the remainder have not been evaluated for individual contribution.

### TRADITIONAL CULTURAL PROPERTIES

The BIA is consulting with nine tribes regarding the identification of cultural resources including TCPs (refer to Section 4.2.4). No TCPs or properties having cultural or religious significance based upon tribal consultations have been identified in the direct or indirect APE.

### 3.2.3 Environmental Consequences

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

The analysis of potential impacts to cultural resources utilized the criteria defined by the regulations for Protection of Historic Properties (36 CFR Part 800), which implement Section 106 of the National Historic Preservation Act. An effect is defined as a direct or indirect alteration to the characteristic(s) of a cultural resource that qualify it for inclusion in the NRHP. Effects are adverse when the alterations diminish the integrity of a cultural resource's location, design, setting, materials, workmanship, feeling, or association. For cultural resources, effects could be the result of ground disturbances, visual or audible disturbances, increased erosion, or changes in public access, traffic patterns, or land use. For this EIS, there would be effects on cultural resources when a site falls within the temporary or permanent disturbance footprint of the SBSPs. There would be effects to cultural resources that are sensitive to visual impacts when the solar fields can be seen from a site and the solar fields and panels dominate the landscape, affecting the site's eligibility to the NRHP.

### DIRECT AND INDIRECT IMPACTS OF THE PROPOSED ACTION

A total of three sites (26CK3536/3848, 26CK10795, and 26CK4585) were identified in the direct APE; two sites were identified during the pedestrian survey and one additional site through the literature review. Neither site identified during pedestrian survey is recommended eligible for the NRHP. One of the two sites, the Old Spanish Trail/Mormon Wagon Road, is listed on the NRHP; however, the segments/traces within the direct APE are recommended as non-contributing to the listing of the site because the segments within the direct and indirect APE have been significantly impacted through commercial traffic, off-road vehicular damage, utilities

installation, and erosion, and have lost all integrity of setting, feeling, association, design, material, and workmanship. The second site (26CK10795), a disturbed trash scatter, is recommended as not eligible for inclusion in the NRHP. The one site identified through the literature search (26CK4585), a previously recorded isolated secondary flake, could not be relocated; however, this site was originally determined ineligible for listing under NRHP and remains not eligible. Because all three sites are not eligible for the NRHP, the Proposed Action would have no direct effects upon historic properties.

Ground-disturbing activities associated with O&M and decommissioning of the Proposed Action would be confined to areas in the temporary disturbance footprint created during construction of the SBSPs. No impacts on cultural resources are expected from O&M or decommissioning activities.

Potential disturbance and/or loss of currently unidentified cultural resources resulting from the implementation of the Proposed Action could occur and possibly add to the loss of information about our heritage in the area and in the region. Such losses would not be expected, however, an Unanticipated Discoveries Plan would be developed and implemented prior to the start of construction of the Projects. Under this Plan, should any previously unidentified cultural resources be discovered during project implementation, all work would cease and the Moapa Band and BIA Regional Archeologist would be immediately notified, would assess the nature of the cultural resources discovered, and the resources would be avoided to the fullest extent practicable.

Seven sites were identified in the indirect APE and were revisited, analyzed, and documented in Appendix E of the BIA 2020 report (*Indirect Effects' Analysis of the Proposed Southern Bighorn Solar Project, Clark County, Nevada*; BIA 2020e: Appendix E). For site 26CK4348 (Tiffany Mill Site), the SBSPs would be visible from the railroad camp component of the site as the Projects lease boundary borders the site. Therefore, the visibility of the SBSPs in relation to the Tiffany Mill Site would result in an adverse visual effect on the property under 26 CFR § 800.5(a)(1). Site 26CK4429/5685 (Railroad) was addressed in recent consultation for the ESMSP. The SBSPs indirect APE is contained entirely within that of the ESMSP. To resolve anticipated adverse visual effect upon the railroad from ESMSP, the BIA developed a Memorandum of Agreement (BIA 2019b) wherein the BIA prepared and implemented a Historic Properties Treatment Plan. Documents developed under the plan subsequently can be used to resolve any potential adverse visual effects to site 26CK4429/5685 (Railroad) that may occur due to the SBSPs. Although the BIA has determined that the Proposed Action would have an adverse effect upon site 26CK4429/5685 (BIA 2020e), the effects have been successfully mitigated. There would be no adverse effect from auditory, vibrational, atmospheric, and olfactory indirect factors on the remaining five sites.

An MOA has been prepared between the Moapa Band, BIA, BLM, and SHPO for the SBSPs (**Appendix O**). This MOA defines the steps to be taken to lessen, resolve, and/or mitigate the adverse effects to site 26CK4348 (Tiffany Mill Site). A detailed monitoring plan would also be prepared that details procedures to ensure that any eligible sites outside the disturbance area are not affected.

### ***Summary of Direct and Indirect Effects of the Proposed Action***

There will be no direct effects to cultural resources as a result of the construction, O&M, or decommissioning of the SBSPs since no eligible cultural resource sites are present in the construction footprint. The SBSPs will have an indirect effect on two properties eligible for listing in the NRHP; therefore, the BIA, in consultation with the SHPO, has determined that a finding of adverse effect is appropriate for the present undertaking (SHPO 2020). The adverse effect to site 26CK4429/5685 (Railroad) has been mitigated by implementation of an MOA developed for the previous ESMSP undertaking. There will be a localized, long-term, adverse effect in the indirect APE on site 26CK4348 (Tiffany Mill Site) if the SBSPs are constructed. An MOA was prepared (**Appendix O**) that lessens, resolves, and/or mitigates the adverse effects to this property.



### **Additional Measures to Avoid and/or Minimize Impacts**

With the implementation of design features and BMPs (**Appendix B**), no additional measures to minimize impacts are recommended.

### **DIRECT AND INDIRECT IMPACTS OF THE NO ACTION ALTERNATIVE**

Under the No Action Alternative, the SBSPs would not be constructed, and no impacts on cultural resources within the SBSPs APE would occur.

## **3.3 Migratory Birds**

### **3.3.1 Affected Environment**

Migratory bird species are protected under the Migratory Bird Treaty Act ([MBTA] 16 U.S.C. §§ 703–711). The MBTA makes it illegal for anyone to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or the parts, nests, or eggs of such a bird, except under the terms of a valid permit issued pursuant to federal regulations. All species native to the U.S. or its territories are protected under the MBTA.

Migratory bird species found within the Moapa Valley include the American pipit (*Anthus rubescens*), ash-throated flycatcher (*Myiarchus cinerascens*), cactus wren (*Campylorhynchus brunneicapillus*), black phoebe (*Sayornis nigricans*), blue grosbeak (*Passerina caerulea*), black-chinned hummingbird (*Archilochus alexandri*), loggerhead shrike (*Lanius ludovicianus*), Lucy’s warbler (*Leiothlypis luciae*), red-tailed hawk (*Buteo jamaicensis*), turkey vulture (*Cathartes aura*), phainopepla (*Phainopepla nitens*), vermilion flycatcher (*Pyrocephalus rubinus*), Gambel’s quail, (*Callipepla gambelii*), mourning dove (*Zenaida macroura*), common raven (*Corvus corax*), and yellow-breasted chat (*Icteria virens*) (Audubon 2020; BIA 2012a). Additional Nevada State Listed species and BLM-Sensitive Species may also occur within the Project area as identified in **Appendix K**. These additional birds include the burrowing owl (*Athene cunicularia*), Le Conte’s thrasher (*Toxostoma lecontei*), greater roadrunner (*Geococcyx californianus*), verdin (*Auriparus flaviceps*), Bendire’s thrasher (*Toxostoma bendirei*), and golden eagle (*Aquila chrysaetos*).

The golden eagle is protected under the MBTA and the Bald and Golden Eagle Protection Act (16 U.S.C. § 668). The Project area contains suitable foraging habitat for golden eagles, but no suitable nesting habitat. The nearest nesting habitat for golden eagles is approximately 3 miles west of the Projects in the Arrow Canyon Mountain Range.

There are no Important Bird Areas (IBAs) within the Project area; the nearest IBA is the Moapa Valley IBA approximately 8 miles from the Projects (Audubon 2020).

### **3.3.2 Environmental Consequences**

#### **DIRECT AND INDIRECT EFFECTS OF THE PROPOSED ACTION**

Impacts on migratory birds and eagles from construction, O&M, and decommissioning would be minimized by implementation of design features and BMPs (**Appendix B**) and the Bird and Bat Conservation Strategy (**Appendix H**), which include the following measures:

- Scheduling vegetation treatments and other ground-disturbing activities to avoid the migratory bird breeding season (February 15 to August 31) to the extent practicable
- Pre-construction surveys for nests if work must be scheduled during the migratory bird breeding season

- Biological monitors to ensure protection of wildlife, including migratory birds
- Overhead power line structures designed to be avian-safe according to Avian Power Line Interaction Committee (APLIC) standards (APLIC 2006, 2012)
- Use of flight diverters and perch deterrents, where appropriate
- Minimal lighting focused in toward solar fields and downward to avoid lighting habitats beyond the solar fields
- Proper disposal and storage of garbage
- Closing of holes and spaces during construction to prevent entrapment
- Implementation of the Worker Environmental Awareness Program and worker training

### ***Migratory Birds***

The Proposed Action could directly affect migratory birds during the construction, O&M, and decommissioning phases. Project activities during construction, O&M, and decommissioning would have the potential to cause visual and aural disturbance and could cause birds to avoid the Project area. Habitat avoidance by migratory birds could indirectly contribute to stress and increased energetic costs as birds may end up nesting and foraging in less suitable habitat. Active bird nests in shrubs or near the ground could be affected during ground-disturbing activities which could result in nest abandonment, nest destruction, and loss of chicks or eggs. These impacts would be minimized by implementation of the Bird and Bat Conservation Strategy (**Appendix H**), which includes BMPs such as conducting vegetation work and ground-disturbing activities outside the migratory bird season when practical, or conducting pre-construction surveys and avoiding active nests if the work cannot be conducted outside of the migratory bird breeding season.

Burrowing owls may be present within the Project area and are particularly susceptible to the impacts described above from ground-disturbing activities. Impacts would be minimized by implementation of BMPs (**Appendix B**) including preconstruction surveys and surveys prior to vegetation clearing during the breeding season for the owls (February 1 through August 31). These surveys would be conducted in suitable habitat within 250 feet of any ground-disturbing activities.

Migratory birds are susceptible to collision and electrocution associated with overhead power lines. The Projects propose a small section of overhead collector lines where these lines cross the BLM-managed designated utility corridor, which could be traversed by four parallel collector lines crossing 0.8 mile of the utility corridor. However, only a portion of this may require overhead collector lines where underground construction is not possible due to conflicts with existing underground utilities. Impacts associated with collision and electrocution would be minimized by implementation of design features and BMPs (**Appendix B**) which include designing overhead power lines to be avian-safe in accordance to APLIC standards (APLIC 2006, 2012). Adverse impacts to migratory birds associated with the overhead collector lines during O&M are not expected to occur due to the small area of overhead collector lines proposed and the implementation of design features and BMPs (**Appendix B**) and measures from the Bird and Bat Conservation Strategy (**Appendix H**).

O&M of the SBSPs may also result in migratory bird mortalities from collision with the PV solar panels and other Project infrastructure. Collision potential would be greatest during the breeding season when birds are most active (Dietsch 2017). In addition, insectivorous birds may be attracted by high concentrations of insects drawn to the solar fields (Horváth et al. 2009). Collision with buildings, radio towers, and other structures, especially those with night lighting may contribute to mortality in small migratory birds (Longcore et al. 2012; Loss et al. 2014). However, bird mortality is expected to be minimal for the SBSPs. The Southern Paiute Solar Project is located on the Reservation adjacent to and within the same habitat types as the SBSPs. The Southern Paiute

Solar Project has been conducting avian mortality surveys since January 2017. Surveys from January 2017 to January 2019 (29 months) have found only nine total avian mortalities at the solar site, four of which were determined to be caused by collision, and all were common species (BIA 2019a: Appendix D). This indicates that issues related to avian mortalities in this area would be minor. In addition, O&M staff would be required to participate in the Worker Environmental Awareness Program training, which would include a reporting protocol for avian mortalities incidentally found during regular O&M activities.

Birds flying at night could be attracted to steady light sources in the Project area and may adjust their flight altitudes, putting them at risk for collision with PV solar panels, power lines, or other Project infrastructure (Gauthreaux 1991; Longcore et al. 2012). Impacts associated with lighting would be minimized through implementation of design features and BMPs (**Appendix B**) and the Bird and Bat Conservation Strategy (**Appendix H**) which includes use of minimal lighting focused in toward solar fields and downward to avoid lighting habitats beyond the solar fields.

Little research exists regarding population-level impacts of PV solar facility mortality on birds. Water bird species may potentially mistake the solar panels for water features on which the birds can land; this theory has been coined the “lake effect hypothesis” (Horváth et al. 2009). These behaviors may lead to collisions with PV solar panels resulting in mortality, injury, or stranding of species that require water to take off again (e.g., grebes and loons). Because bird fatality data for PV solar facilities is exceptionally limited, science-based predictions of potential bird risk are also limited. Unlike wind energy, few studies currently address bird impacts from PV solar and risks to these species are not well understood (BSG Ecology 2014; Clement et al. 2014; Kosciuch et al. 2020; Walston Jr. et al. 2016). Avian collision with PV panels was a leading cause of death at PV solar facilities identified in the Multiagency Avian-Solar Coordination Plan (The Multiagency Avian-Solar Collaborative Working Group 2016) but there was considerable variability in mortality rates for carcasses with known project-related causes of death at utility-scale solar energy facilities. The level of mortality observed at solar facilities is variable and there remains uncertainty in the population-level impacts of utility scale solar avian mortality (Walston Jr. et al. 2016). Two studies from 2015 and 2016 reviewed avian mortality data from several PV solar facilities and concluded that additional research is needed to address hypotheses regarding how solar facilities may interact with bird populations including whether some project features may attract birds to the facility and increase risk of mortality (Argonne National Laboratory and the National Renewable Energy Laboratory 2015; The Multiagency Avian-Solar Collaborative Working Group 2016). A more recent study from 2020 also reviewed avian mortality data from PV solar facilities in California and Nevada. This study came to four main conclusions: (1) the four most common species of birds impacted were species with populations in the millions and three of these four were ground-dwelling birds; (2) most bird impacts occurred in the fall; (3) there was no evidence that large-scale facilities result in greater impacts to nocturnal migrating birds or water-associated or water-obligate birds; and (4) most detections of impacts were of unknown cause (Kosciuch et al. 2020).

The presence of water birds within the Project area is unlikely since there are no major water bodies to concentrate water birds during migration, breeding, or stopover periods in close proximity to the Project area. The nearest perennial water source is at the Muddy River located 8 miles north of the Projects. Because water birds generally move along migratory corridors with existing water sources and available stopover habitat, it is highly unlikely that water birds would occur within the Project area.

A Site Restoration Plan (**Appendix D**) has been developed that defines the procedures for the revegetation and rehabilitation of areas disturbed by the SBSPs. The direct and indirect impacts to migratory birds during decommissioning activities would be similar to the impacts that would occur during construction, including nest abandonment, nest destruction, loss of chicks or eggs, visual and aural disturbance, and habitat avoidance by migratory birds. These impacts would be minimized by implementation of the Bird and Bat Conservation

Strategy (**Appendix H**) as discussed for construction. The future removal of Project infrastructure, the revegetation of disturbed areas, and the absence of a continual O&M presence would likely result in an increase of foraging and nesting habitat for migratory birds and elimination of collision hazards associated with the solar fields.

While impacts on migratory birds would occur due to the Proposed Action, these impacts would not affect populations, and the implementation of design features and BMPs (**Appendix B**) and the Bird and Bat Conservation Strategy (**Appendix H**) would minimize impacts. Therefore, the Proposed Action would have negligible, localized, short- and long-term, direct and indirect, adverse impacts on migratory birds.

### ***Bald and Golden Eagles***

The Project area does not contain any suitable nesting habitat for golden eagles, though there is the potential for golden eagles to forage in the vicinity of the SBSPs, given the proximity of the Projects to areas that could potentially be used for nesting. Bald eagles are not expected to use any habitats present in or immediately around the Project area due to the lack of aquatic habitats.

During construction, O&M, and decommissioning, golden eagles may be subject to visual and noise disturbance as described above, potentially resulting in alteration of foraging behaviors. The SBSPs would impact suitable foraging habitat, but due to the distance between the Projects and the nearest nesting habitat (greater than 3 miles) and the general availability of suitable foraging habitat in the area, impacts are anticipated to be negligible. Golden eagles may still utilize the Project area for foraging during O&M, when there would be less human activity and disturbance.

Golden eagles are susceptible to collision and electrocution associated with overhead power lines. As discussed above for migratory birds, the Projects propose a small section of overhead collector lines where these lines cross the BLM-managed designated utility corridor. Impacts associated with collision and electrocution would be minimized by implementation of design features and BMPs (**Appendix B**) which include designing overhead power lines to be avian-safe in accordance to APLIC standards (APLIC 2006, 2012). Adverse impacts to golden eagles are highly unlikely due to the small area of overhead collector lines proposed and the implementation design features and BMPs (**Appendix B**) and measures in the Bird and Bat Conservation Strategy (**Appendix H**).

The Proposed Action would have negligible, localized, short- and long-term, direct and indirect, adverse impacts on bald and golden eagles.

### ***Summary of Direct and Indirect Effects of the Proposed Action***

The Proposed Action would have negligible, localized, short- and long-term, direct and indirect, adverse impacts on migratory birds. Implementation of design features and BMPs (**Appendix B**) and the Bird and Bat Conservation Strategy (**Appendix H**) would minimize direct and indirect impacts during construction, O&M, and decommissioning.

The Proposed Action would have negligible, localized, short- and long-term, direct and indirect, adverse impacts on bald and golden eagles. Adverse impacts to golden eagles are highly unlikely due to the small area of overhead collector lines proposed, the distance between the Projects and the nearest nesting habitat (greater than 3 miles), and the implementation of design features and BMPs (**Appendix B**) and measures in the Bird and Bat Conservation Strategy (**Appendix H**).

### **Additional Measures to Avoid and/or Minimize Impacts**

With the implementation of the BMPs and other design features in **Appendix B**, no additional measures to minimize impacts are recommended.

### **DIRECT AND INDIRECT EFFECTS OF THE NO ACTION ALTERNATIVE**

Under the No Action Alternative, the SBSPs would not be constructed and there would be no impacts to migratory birds.

## **3.4 Socioeconomics**

### **3.4.1 Affected Environment**

The SBSPs would be located on undeveloped lands on the Reservation. Census data limited to the boundaries of the Reservation is available as Block Group 2 within census tract (CT) 59.02. Data for CT 59.02—which covers a large portion of rural northern Clark County, in addition to the Reservation—is provided for comparison. Socioeconomic information is also provided for Clark County as a whole since it physically borders the Reservation and because some of the labor and materials employed in the construction of the SBSPs would be sourced from the surrounding Clark County area. Data for the State of Nevada is provided as a basis for comparison.

### **POPULATION, DEMOGRAPHICS, AND SOCIAL SERVICES**

According to the 2018 American Community Survey 5-Year Estimate (U.S. Census Bureau 2018), there were 294 people residing on the Reservation, 1,295 people residing in CT 59.02, 2,141,574 people residing in Clark County, and 2,922,849 people residing in the State of Nevada. The racial makeup of the Reservation is predominantly American Indian and Alaskan Native (78 percent), which is substantially higher than the Indian population for the County and State (1 percent for both). Approximately 22 percent of the population in CT 59.02 is American Indian or Alaskan Native, but the majority (230 of 284) reside within the Reservation. The Hispanic population within the Reservation (15 percent) is smaller than that of CT 59.02 (28 percent), Clark County (31 percent), and Nevada (31 percent). There is also a smaller elderly population on the Reservation (7.5 percent) when compared to CT 59.02 (10 percent), the County (14 percent), and State (17 percent).

**Table 3-4** and **Table 3-5** provide the demographic characteristics for each geographic area.

**Table 3-4. Selected Demographic Characteristics**

	Population	White (Percent)	Black (Percent)	American Indian/ Alaska Native (Percent)	Asian (Percent)	Native Hawaiian/ Pacific Islander (Percent)	Other Race (Percent)	Two or More Races (Percent)
Reservation	294	22 (7.5)	8 (2.7)	230 (78.2)	0 (0)	19 (6.5)	9 (3.1)	6 (2.0)
CT 59.02	1,295	855 (66)	76 (6)	282 (22)	0 (0)	19 (1)	47 (4)	16 (1)
Clark County	2,141,574	1,299,138 (61)	245,827 (11)	16,590 (1)	205,824 (10)	15,846 (1)	246,907 (12)	111,442 (5)
Nevada	2,922,849	1,935,103 (66)	261,123 (9)	35,845 (1)	234,693 (8)	19,352 (1)	296,234 (10)	140,499 (5)

Source: U.S. Census Bureau 2018

**Table 3-5. Hispanic and Elderly Population**

	Population	Hispanic (Percent)	Elderly (Percent)
Reservation	294	44 (15)	22 (7.5)
CT 59.02	1,295	369 (28)	124 (10)
Clark County	2,141,574	662,081 (31)	301,845 (14)
Nevada	2,922,849	900,599 (31)	498,219 (17)

Source: U.S. Census Bureau 2018

Public services include public facilities and social services such as parks, schools, libraries, hospitals, and police and fire departments. There are no public services located within the Project area; police, fire, and medical services are provided by facilities in neighboring communities such as Moapa and Overton. Nearby schools are provided by the Clark County School District and include the Ute V Perkins Elementary School in the town of Moapa, W. Mack Lyon Middle School in Overton, and Moapa Valley High School in Overton. Additional educational services are provided by the Moapa Educational Support Center located on the Reservation. Other public facilities serving the local community include the Warm Springs Natural Area, Ron Lewis Park, Moapa Community Center, Moapa Recreation Center, Moapa Town Public Library, and the U.S. Post Office in Moapa.

### EMPLOYMENT, EARNINGS, AND INCOME

In 2018, the unemployment rate on the Reservation was approximately 6.8 percent, which is lower than the rate for CT 59.02 (9.3 percent), Clark County (7.2 percent), and Nevada (6.9 percent). In 2018, the median income for a household on the Reservation was \$35,313, which is substantially lower than the median household income in CT 59.02 (\$62,560), the County (\$57,598), and the State (\$56,802). **Table 3-6** provides income and employment characteristics for each geographic area.

**Table 3-6. Selected Income and Employment Characteristics**

	Median Household Income	Poverty Rate (Percent)	Unemployment Rate (Percent)
Reservation	\$35,313	25.0	6.8
CT 59.02	\$62,560	10.0	9.3
Clark County	\$56,802	14.1	7.2
Nevada	\$57,598	13.7	6.9

Source: U.S. Census Bureau 2018

The Clark County economy is heavily dependent on the leisure and hospitality sector, as well as closely linked supporting sectors in arts, entertainment, and retail trade establishments. This is reflected in the census data which indicates the arts, entertainment, recreation, and hospitality industries are the largest employers in Clark County (282,094 employees or 28.1 percent of the workforce). The retail industry ranks fourth in the county and employs 118,647 workers or 11.8 percent of the workforce. In addition, hotel and resort renovation,

development, and expansion within Las Vegas have traditionally been a mainstay of the Clark County economy. The census data indicate that 77,140 workers (7.0 percent of the workforce) are employed in the construction industry (U.S. Census Bureau 2018) in the County. In contrast, the largest employer within the Reservation is public administration (33 employees or 27.3 percent of the Reservation workforce). Education, healthcare, and social services is the second largest industry on the Reservation, employing 19 workers (15.7 percent of the workforce); construction is the third largest industry on the Reservation (17 employees or 14 percent of the Reservation workforce); and the arts, entertainment, recreation, and hospitality industries are fourth, employing 16 workers (13.2 percent of the Reservation workforce) (U.S. Census Bureau 2018).

According to the U.S. Census Bureau (2016), an impoverished community is defined as one in which more than 20 percent of the population is below the poverty level. For a single person (not a family) the poverty income threshold is \$13,011. For a family of four with two children under the age of 18, the poverty income threshold is \$26,172. The Reservation and Clark County's median incomes are above the current 2019 poverty thresholds. Despite the lower unemployment rate, the Reservation has a substantially higher poverty rate (25 percent) as compared to CT 59.02 (10 percent), the County (14 percent), and the State (14 percent ) With the exception of the Reservation, these are all relatively similar to the national poverty rate of 14.1 percent (U.S. Census Bureau 2018). These income data support the conclusion that there are environmental justice communities defined by income. In addition, Native American persons residing on the Reservation are considered an eligible environmental justice community as defined by Executive Order 12898.

#### **TRIBAL AND PUBLIC REVENUES**

Tribal revenue sources include lease income from other development projects on the Reservation as well as sales taxes generated by the purchase of goods and services from tribal businesses. Public revenues include sales and income (payroll) taxes.

#### **3.4.2 Environmental Consequences**

This section discusses effects on social and economic resources that may occur from implementation of the Proposed Action. The additional jobs created by the SBSPs would be a benefit to the Moapa Band and community. In addition to employment benefits, there would also be benefits to Reservation-area businesses (both tribal and private) from the sale of food, gasoline, and water during construction and, to a lesser extent, during O&M. The Moapa Band would also benefit from the lease revenues generated by the SBSPs over the life of the Projects.

There are no specific federal thresholds of significance for socioeconomic impact assessments. Significance varies based on the setting of the proposed project (40 CFR § 1508.27[a]), but 40 CFR § 1508.8 states that indirect effects may include those that are growth-inducing and others related to induced changes in the pattern of land use, population density, or growth rates. In addition, the regulations state: "Effects include...cultural, economic, social, or health, whether direct, indirect, or cumulative." Effects may also include those resulting from actions that may yield both beneficial and detrimental effects, even if on balance the agency believes that the effect would be beneficial (40 CFR § 1508.8).

#### **DIRECT AND INDIRECT EFFECTS OF THE PROPOSED ACTION**

##### ***Population, Demographics, and Public Services***

Most workers employed during all phases of the Projects would be sourced from the labor pool within the Reservation and surrounding region. Therefore, the SBSPs would not result in any long-term change in the population size, demographics, housing availability, or demand for services. During construction, the workforce

for each Project could reach a peak of 750 workers, most of whom would be tribal members or Clark County residents. Workers may stay at hotels near the Project area during construction, which would be easily accommodated by the regional infrastructure which is designed for seasonal demands and fluctuations from global tourism. Since mostly tribal and Clark County residents would be employed, the Projects would not cause a temporary population increase that would necessitate additional public services or investment in infrastructure capacities that could not be provided from existing resources. Only five full-time equivalent workers would be employed during the O&M phase, most of whom would be tribal members and Clark County residents. Therefore, there would be no long-term impact on population, demographics, and public services on the Reservation and surrounding region. Decommissioning is expected to have similar impacts as construction, though less workers would be required and for a shorter period of time.

### ***Employment, Earnings & Income***

Construction employment and spending would provide a short-term economic benefit within the Reservation and Clark County. Construction would provide a short-term boost to the local/regional construction sector since the majority of construction workers would be hired from within the Reservation and/or Clark County. Under the Tribal Employment Rights Ordinance agreement between the Moapa Band and the Applicants, tribal members would have first right of refusal for any job positions for which they are qualified. During construction, employment for each Project would reach an average of 300 workers with a peak not expected to exceed 750 workers at any given time. Construction of SBSP I is expected to take approximately 14 to 16 months and construction of SBSP II is expected to take approximately eight to 10 months. The two Projects may be constructed simultaneously or sequentially.

As mentioned above, it is likely that most of the workforce would be tribal members or would commute from the Clark County/Greater Las Vegas region. Therefore, most of their earnings would be recycled back into the Clark County regional economy through spending of disposable income. In addition, workers would provide a temporary stimulus to the local economy as they spend per diem money on hotels, meals, and consumables. This direct spending in the area may also indirectly create jobs.

The construction jobs are expected to be relatively high paying. These jobs are clean/renewable energy opportunities that are expected to grow at above-average rates and pay above-average wages. Therefore, the SBSPs would help diversify the labor force of Clark County and add capacity and valuable utility-scale solar installation experience to the labor pool. The construction phase of the Projects is expected to have a short-term, beneficial impact on unemployment levels. The level of employment impact would be minor for the County but moderate for Moapa Band members on the Reservation. As mentioned above, Moapa Band members would have first right of refusal for any job positions for which they are qualified. As a result of this agreement, unemployment levels within the Reservation could decrease in the short- and long-term.

During O&M, direct payroll and Project-related spending would have a minor, long-term, beneficial impact on the employment and income within the Reservation and surrounding region. The impacts to employment and income from decommissioning would be similar, but slightly less, than those from construction.

### ***Tribal and Public Revenues***

During construction, the SBSPs would generate a non-recurring contribution to the Moapa Band and non-tribal public revenues from the sale of water, aggregate, and other materials. In addition, the Moapa Band could benefit from increased sales at the Tribal Plaza restaurant and store. The workforce would generate payroll taxes that would flow to federal, State, and local treasuries. In addition, tax revenues for the Reservation and Clark County would be generated from direct and indirect expenditures on materials, equipment, and supplies.



Over the term of the lease agreements for the SBSPs (up to 50 years), the proposed Projects would generate an annual rent to the Moapa Band as specified in the lease agreements. This long-term, predictable revenue would be used by the Moapa Band to expand social programs, economic development, resource protection, and other programs that would benefit the Moapa Band. Payments would also be made to the Moapa Band by the Applicants in lieu of taxes, in accordance with the Tribal Tax Agreement.

In addition, the BLM would collect revenues from the annual rents for ROWs associated with the collector lines, gen-tie line, and existing access roads. In accordance with the provisions of Public Law 96-491 that established the BLM-managed designated utility corridor on the Reservation, “The Secretary of the Interior shall be responsible for establishing and collecting fees for the use of such right-of-way...[and] any payment of such fees to the Secretary...shall be made for the benefit of the Moapa Band of Paiutes.” This will provide additional long-term revenue to the Moapa Band.

During O&M, expenditures on materials and supplies would generate tax revenues for Clark County over the operational lifespan of the Projects. Payroll taxes during O&M would also generate revenue for federal, State, and local treasuries. The potential effects on tribal and public revenues from decommissioning would be similar to those from construction. These activities would also provide a short-term stimulus to the local economy. Following decommissioning, the land occupied by the Projects would become available for other uses including the historic, traditional desert use of the properties under tribal stewardship.

Overall, the Project would have a minor, short-term, beneficial impact on tribal and public revenues during construction and decommissioning. During O&M, the Projects would have a long-term, major, beneficial impact on tribal revenues, and a long-term, negligible, beneficial impact on public revenues in the surrounding region.

#### ***Summary of Direct and Indirect Effects of the Proposed Action***

The Proposed Action would have short- and long-term, direct and indirect, beneficial impacts on socioeconomics from the increase in employment, income, expenditures, and tribal and public revenues. Effects would be greatest during the construction and decommissioning phases due to the size of the workforce required. Although long-term benefits to employment and income would be less during O&M, the lease revenue generated by the Projects would have a long-term, beneficial effect on tribal revenue. The beneficial effects to socioeconomics on the Reservation would be major, while the beneficial effects on the regional economy would be negligible.

#### ***Additional Measures to Avoid and/or Minimize Impacts***

With the implementation of the BMPs and other design features in **Appendix B**, no additional measures to minimize impacts are recommended.

#### **DIRECT AND INDIRECT EFFECTS OF THE NO ACTION ALTERNATIVE**

Under the No Action Alternative, the lease agreements would be denied, the BLM ROWs would not be issued, and the Projects would not be built. The Moapa Band would not benefit economically from the lease income and sale of water, aggregate, and other materials that would be generated by the solar Projects. There would be no increase in employment and income on the Reservation or in Clark County, and no additional tax revenues would be generated. Therefore, the No Action Alternative would have a moderate adverse effect on socioeconomics for the Moapa Band.

## 3.5 Threatened and Endangered Species

### 3.5.1 Affected Environment

An official list of federally listed species that may occur within the Project area was obtained from the USFWS Information for Planning and Consultation System (IPaC). A copy of the USFWS official species list can be found in the Biological Assessments (**Appendix M**). Yellow-billed cuckoo (*Coccyzus americanus*) and Moapa dace (*Moapa coriacea*) were added to the list in the Biological Assessments due to proximity to the Project area (**Appendix M**). **Table 3-7** identifies the species and their likelihood to occur within the Project area. There is no designated or proposed critical habitat for these species in the Project area.

**Table 3-7. Threatened, Endangered, and Candidate Species with Potential to Occur in the Project Area**

Common Name	Scientific Name	Status	Potential to Occur within Project Area for the SBSPs
Moapa dace	<i>Moapa coriacea</i>	Endangered	Not likely to occur. Nearest suitable habitat is associated with the Warm Springs area of the Muddy River 11 miles from SBSP I and 10 miles from SBSP II. This species is addressed due to groundwater withdrawal affecting habitat in the Muddy River.
Mojave desert tortoise	<i>Gopherus agassizii</i>	Threatened	Known to occur within the Project area for both SBSPs.
Southwestern willow flycatcher	<i>Empidonax traillii extimus</i>	Endangered	Not likely to occur. Nearest suitable habitat is associated with the Warm Springs area of the Muddy River 11 miles from SBSP I and 10 miles from SBSP II.
Yellow-billed cuckoo	<i>Coccyzus americanus</i>	Threatened	Not likely to occur. Nearest suitable habitat is associated with the Warm Springs area of the Muddy River 11 miles from SBSP I and 10 miles from SBSP II.
Yuma Ridgway's rail	<i>Rallus longirostris yumanensis</i>	Endangered	Not likely to occur. Nearest suitable habitat is associated with the Overton Wildlife Management Area of the Muddy River 15 miles from both SBSPs.

#### MOAPA DACE

The Moapa dace was listed as an endangered species under the Endangered Species Act (ESA) on March 11, 1967 (USFWS 1967). The original recovery plan for this species was prepared in 1983 and subsequently revised in 1996 (USFWS 1983a, 1996). Threats to the Moapa dace include habitat loss and alteration, introduction of non-native species, fragmentation, and parasites (USFWS 2009).

The Moapa dace inhabits a variety of habitats throughout its several life stages. As individuals age, they occupy habitats with increasing flow velocities: larval dace are limited to slackwater of the upper reaches of tributaries of the Moapa River, and adults can be found in the river's mainstem. The species prefers warmer temperatures (67–89.6°F); cooler temperatures in the middle portion of the Moapa River mainstem may function as a barrier to downstream movements (USFWS 1996). The species is omnivorous and often forages from drift stations in large groups (up to 30 individuals). These sites are often characterized by overhanging vegetation or particularly deep areas (USFWS 1996).

The Moapa dace is endemic to and occurs in the Muddy River system (and associated thermal spring systems). Specifically, it occurs in the Warm Springs area which is located approximately 11 miles north of SBSP I and

10 miles north of SBSP II. Previous surveys found adult Moapa dace occurring in low numbers in restricted portions of three springs and less than 2 miles of spring outflow and river in the Warm Springs area (USFWS 1983a). Moapa dace likely once inhabited 25 springs and approximately 16 kilometers (9.9 miles) of the upper Muddy River (Ono et al. 1983).

### MOJAVE DESERT TORTOISE

The Mojave desert tortoise was listed as threatened under the ESA on April 2, 1990 (USFWS 1990). A total of 6.4 million acres of critical habitat was designated in 1994 (USFWS 1994a). Genetics, morphology, behavior, ecology, and habitat use were used to define recovery units for six distinct population segments of the desert tortoise in the 1994 Recovery Plan (USFWS 1994b). The boundary of these units was refined in the Revised Recovery Plan (USFWS 2011). The SBSPs occur within the Northeastern Mojave Recovery Unit, which encompasses almost 5 million acres extending from southwestern Utah/northwestern Arizona (northern boundary) to Las Vegas/Las Vegas Wash (southern boundary). This unit includes the Beaver Dam Slope, Gold Butte-Pakoon, and Mormon Mesa critical habitat units, though there is no critical habitat present within the Project area.

Tortoises in this portion of the Mojave Desert are active in late summer and early autumn in addition to spring, reflecting the fact that this region receives up to 40 percent of its annual rainfall in the summer which supports two distinct annual floras on which tortoises can forage. Desert tortoises feed on cacti, perennial grasses, and herbaceous perennials. Desert tortoises dig burrows (usually located under shrubs) and den in caliche caves in bajadas, washes, or caves in sandstone rock outcrops for winter hibernation and summer estivation (USFWS 2011, 2019b). Additional detail about the natural history and status of desert tortoise can be found in the Biological Assessments and Biological Opinions that were prepared for the Projects (**Appendices M and N**).

Field surveys were conducted in April 2019 to assess the presence of the Mojave desert tortoise in the lease option area for the Projects. The surveys covered 100 percent of the lease option areas for both Projects and were conducted in accordance with current USFWS protocols (USFWS 2019b). The objectives of the field surveys were to determine presence or absence of desert tortoises, estimate the number of tortoises (abundance), and assess the distribution of tortoises within the lease option areas (USFWS 2019b).

A total of 33 adult desert tortoises ( $\geq 180$  mm midline carapace length) and 2 juveniles were observed over the course of the surveys (30 adults and 2 juveniles for SBSP I and 3 adults and 0 juveniles for SBSP II; see **Figure 3-1**). Desert tortoise sign (i.e., scat, carcasses/shell fragments, tracks, pellets, and burrows) were observed throughout the survey areas for both Projects. For SBSP I, the estimated number of adult tortoises within the lease option area was calculated to be 60, with a 95-percent confidence interval of approximately 41 to 88 adult tortoises. For SBSP II, the estimated number of adult tortoises within the lease option area was calculated to be 6, with a 95-percent confidence interval of 2 to 14 adult tortoises.

### SOUTHWESTERN WILLOW FLYCATCHER

On February 27, 1995, the southwestern willow flycatcher was listed as endangered within its entire range under the ESA (USFWS 1995). Critical habitat for the species was originally established in 1997 (USFWS 1997) but was subsequently vacated; incidental protection was provided along the Virgin River and its 100-year floodplain from the Arizona/Nevada border to Halfway Wash in Nevada due to designation of critical habitat for two fish species, woundfin (*Plagopterus argentissimus*) and Virgin River chub (*Gila seminuda*) (USFWS 2000).

Critical habitat was again proposed on October 12, 2004 (USFWS 2004), redefined and re-instituted in 2005 (USFWS 1997, 2005), and designated in 2013 (USFWS 2013). Critical habitat for the southwestern willow

flycatcher in Nevada is currently limited to portions of the Virgin River above its confluence with the Muddy River (USFWS 2005).

For nesting, southwestern willow flycatchers require dense riparian habitats with microclimatic conditions dictated by the local surroundings. Saturated soils, standing water, or nearby streams, pools, or cienegas are a component of nesting habitat that also influences the microclimate and density of the vegetation component. No suitable riparian or microhabitat conditions exist within the Project area. The closest known breeding habitat for this species is located along the Muddy River at Warm Springs Ranch approximately 11 miles north of SBSP I and 10 miles north of SBSP II. During 2019 surveys, eight southwestern willow flycatcher territories were identified, including two confirmed pairs, three unpaired residents, and one non-resident (Southern Nevada Water Authority [SNWA] 2019). There is no suitable habitat for the species in or near the Project area.

### **YELLOW-BILLED CUCKOO**

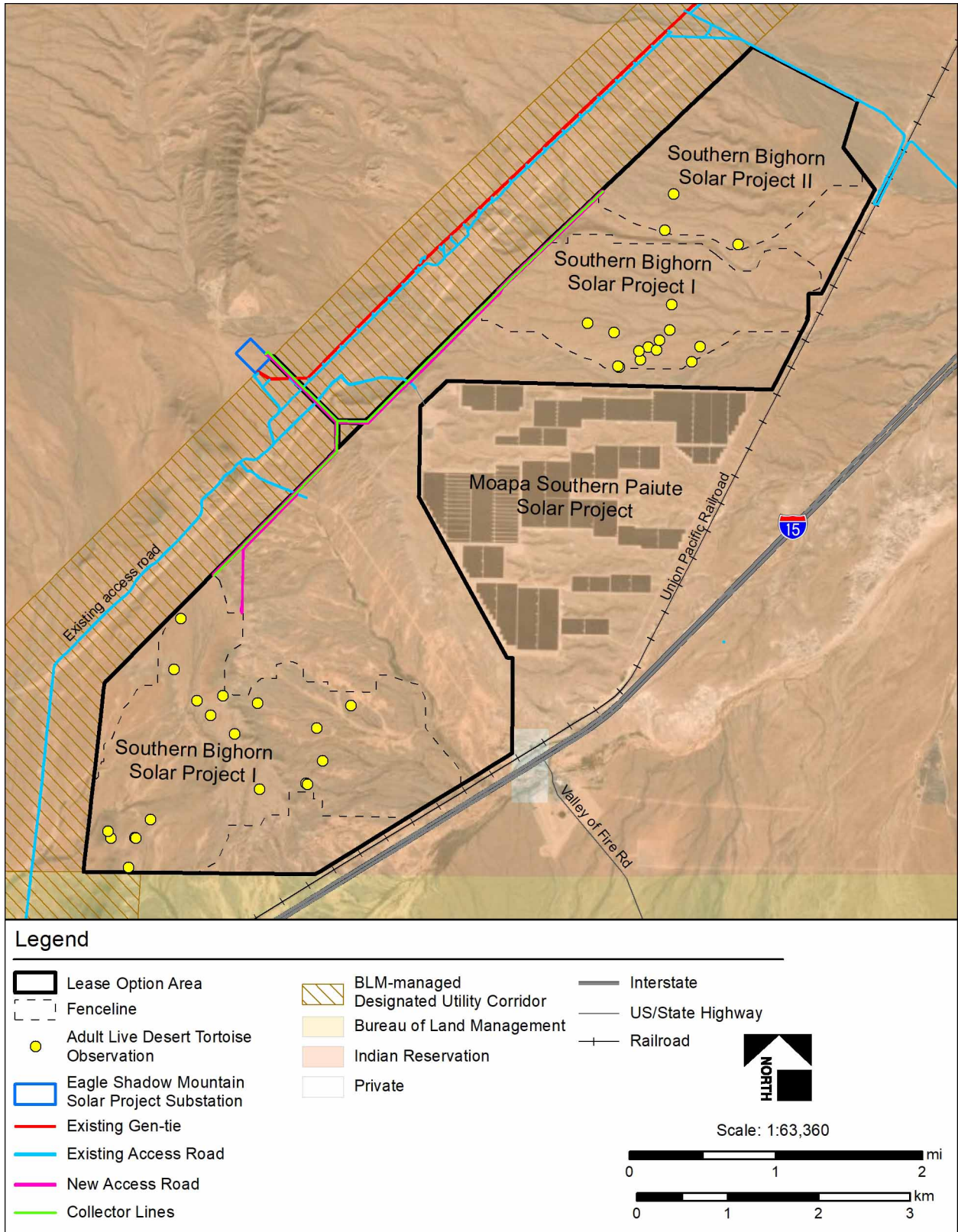
On October 3, 2014, the yellow-billed cuckoo was listed as threatened under the ESA (USFWS 2014a, 2014c). Critical habitat has not yet been designated but was proposed on February 27, 2020 (USFWS 2020a). The yellow-billed cuckoo has always been rare in Nevada. There are still small areas of suitable habitat within the state, with documented breeding occurring very rarely in southern Nevada. Yellow-billed cuckoos may still utilize remnant habitats present within the state during migration. The scattered cottonwoods on the Colorado River tributaries (Virgin, Muddy, and Pahranaagat) are the last places in Nevada where the yellow-billed cuckoo can potentially occur.

The only known nesting sites in Nevada for the yellow-billed cuckoo are at Warm Springs Ranch Natural Area along the Muddy River in the Moapa Valley (SNWA 2019) approximately 11 miles north of SBSP I and 10 miles north of SBSP II. While two individual cuckoos were detected during 2019 surveys at Warm Springs Natural Area, there is no suitable habitat for the species in or near the Project area for the SBSPs.

### **YUMA RIDGWAY'S RAIL**

The Yuma Ridgway's rail (previously called the Yuma clapper rail) was listed as an endangered under the ESA on March 11, 1967 (USFWS 1967). The Recovery Plan was finalized in 1983 and portions of the recovery action plan were initiated over the ensuing years (USFWS 1983b). The Yuma Ridgway's rail is one of the smaller subspecies of clapper rail, with adult males standing 8 inches tall and weighing 266.8 grams on average (Todd 1986). Females are slightly smaller. Adult Yuma clapper rails of both sexes are similar in plumage; they possess a long, slender bill and long legs and toes compared to body size (Todd 1986).

The present range of the Yuma Ridgway's rail in the U.S. includes portions of Arizona, California, and Nevada. The Yuma Ridgway's rail lives in freshwater marshes dominated by cattail (*Typha* sp.) and bulrush (*Scirpus* spp.) with a mix of riparian tree and shrub species (*Salix exigua*, *S. gooddingii*, *Tamarix* spp., *Tessaria sericea*, and *Baccharis* spp.) along the shoreline of the marsh (Eddleman 1989). This species is known to occur along the Muddy River within the Overton Wildlife Management Area approximately 15 miles east of both Projects. No suitable habitat for this species occurs within or near the Project area. However, recent research suggests this species can undertake long migrations and that movement is not limited to river corridors. A recent study using satellite transmitters on Yuma Ridgway's rails found that, while this species has been considered non-migratory, some Yuma Ridgway's rails conduct fall migratory movements between the U.S. and Mexico, migrating long distances over inhospitable terrain (Harrity and Conway 2020). This indicates that while breeding habitat does not occur in the Project area, this species may migrate over the Projects.



**Figure 3-1. Mojave Desert Tortoise Survey Results for the Southern Bighorn Solar Projects**

### 3.5.2 Environmental Consequences

#### DIRECT AND INDIRECT EFFECTS OF THE PROPOSED ACTION

Five federally listed species have the potential to occur in or around the Project area and to be impacted by the SBSPs (see **Table 3-7**). Surveys for federally listed species and analysis of their habitat indicate that only the Mojave desert tortoise occurs in the Project area. The other four species (Moapa dace, southwestern willow flycatcher, yellow-billed cuckoo, Yuma Ridgway's rail) are known to occur in nearby habitats along the Muddy River and are analyzed in this section due to their proximity to the Projects. Potential impacts are summarized for these species below; more detail on the potential impacts to these species can be found in Section 5 of the Biological Assessments that have been prepared concurrently with this EIS (**Appendix M**). Additionally, Biological Opinions have been issued by USFWS for the Projects and are provided in **Appendix N**.

#### *Moapa Dace*

The Moapa dace is only known to occur in the Muddy River and several associated headwater springs in the Warm Springs area. The Moapa dace would not be directly affected by the construction, O&M, or decommissioning of the SBSPs. The withdrawal of up to 200 AFY of groundwater for construction and up to 20 AFY for O&M for each of the two Projects represents the only potential indirect effect to this species. This could result in up to 400 AFY of groundwater for construction if the Projects are constructed simultaneously, and 40 AFY for O&M once both Projects are constructed. The effects of groundwater withdrawals of up to 16,100 AFY were previously analyzed in a 2006 Programmatic Biological Opinion that addressed groundwater withdrawals in the Lower White River Flow System (LWRFS) Hydrographic Basin (USFWS 2006); effects of groundwater withdrawals for the SBSPs would contribute to current and future adverse effects that were analyzed in the Programmatic Biological Opinion.

The Biological Assessments for the Projects determined that groundwater pumping associated with the Proposed Action may affect and is likely to adversely affect the Moapa dace (**Appendix M**), and the Biological Opinions for the Projects concluded that the Projects are not likely to jeopardize the continued existence of the Moapa dace (**Appendix N**). The Biological Opinions also concluded that incidental take of Moapa dace through harm is unlikely to occur, but some take through habitat loss, modification, or degradation may occur. The Proposed Action would have no direct impacts on Moapa dace, but would have minor, regional, short- and long-term, indirect, adverse impacts on the species.

#### *Mojave Desert Tortoise*

The potential direct and indirect effects to Mojave desert tortoise resulting from implementation of the Proposed Action include:

- Injury or mortality from construction activities
- Temporary stress from handling during translocation efforts
- Temporary constriction of movement during construction
- Disturbance from vibrations during construction near the boundary of the construction areas
- Temporary and permanent loss of suitable habitat and burrows
- Noise and lighting effects on behavior and movement
- Exposure to chemicals (herbicides, palliatives, and spills from equipment)
- Increased raven and other predator populations resulting from perches provided by solar structures, perimeter fencing, overhead collector line structures, and human introduction of trash

The Proposed Action includes implementation of minimization measures intended to minimize effects on Mojave desert tortoise, as identified in the Biological Opinions for the Projects (**Appendix N**) and list of BMPs (**Appendix B**). In summary, the minimization measures and BMPs include preconstruction surveys, biological monitoring, temporary exclusionary fencing, translocation of desert tortoise out of construction areas, and implementation of the Integrated Weed Management Plan (**Appendix E**), Raven Control Plan (**Appendix I**), and Worker Environmental Awareness Program during construction, O&M, and decommissioning.

Construction-related effects on the desert tortoise would include direct mortality or injury as a result of being crushed by vehicles and disturbance of soil. Construction would also restrict desert tortoise movement in the Project area due to exclusionary fencing and would temporarily disturb desert tortoise due to construction vibration, noise, and lighting. Desert tortoises would also be directly affected during translocation which can result in harassment and/or mortality. Refer to the Biological Assessments and Biological Opinions for each Project (**Appendices M and N**) for detailed analysis of these potential effects.

These construction-related effects could impact up to 102 desert tortoises (88 for SBSP I and 14 for SBSP II), however these impacts would be minimized by surveys, monitoring, and translocation of desert tortoises outside of the construction areas. There is potential for some adult desert tortoises to be injured or killed, but with the implementation of BMPs and minimization measures (**Appendices B and N**), the numbers are expected to be small. Because of the difficulty in locating juvenile desert tortoises and eggs, some may not be found during preconstruction surveys and could be crushed or injured during Project construction. Adult desert tortoises are more easily detected during preconstruction surveys due to their large size, so it is expected that all adult desert tortoises would be translocated. For this translocation, tortoises within 500 meters (1,640 feet) of the fence for each Project would be relocated outside the fence and those on the interior of the solar fields (greater than 500 meters [1,640 feet] from the fence) would be moved to temporary holding pens and returned to the site following construction. The recipient sites for these translocated desert tortoises are shown in Figure 3-1 of the Biological Assessments for each Project (**Appendix M**) and in the Desert Tortoise Translocation Plans (**Appendix to the Biological Opinions in Appendix M**).

The construction-related effects would also be minimized by implementation of a Raven Control Plan (**Appendix I**) which would require trash and litter control and reduce potential for predator-related effects on desert tortoises. Capturing, handling, and relocating desert tortoises out of the solar site may result in harassment and possibly injury or death (Blythe et al. 2003). To minimize this effect, tortoises would be handled in accordance with USFWS handling protocols (**Appendix B**).

If the Projects are constructed simultaneously, the intensity of effects during construction would be slightly greater as more desert tortoises would be affected and translocated simultaneously, but the duration of effects would be shorter (up to 16 months). If the Projects are constructed sequentially, the duration of effects would be longer (up to 26 months, 16 months for SBSP I and 10 months for SBSP II), but the intensity of effects would be spread out over a longer period.

In addition to the direct and indirect effects of construction on the tortoise, temporary and permanent disturbance to desert tortoise habitat would occur. The Projects would result in 2,871 acres of temporary disturbance to suitable habitat (2,141 acres for SBSP I and 731 acres for SBSP II) and 794 acres of permanent disturbance (501 acres for SBSP I and 296 acres for SBSP II, 4 acres shared by both Projects). For the temporary disturbance, vegetation would be impacted initially during construction. The vegetation would be driven over and crushed and/or trimmed to a height of 18 inches, where needed, using a string trimmer and/or mower. This treatment would leave the roots intact allowing herbaceous and woody vegetation to re-establish more quickly following construction, ensuring that these impacts to desert tortoise habitat are not permanent.

O&M activities along the collector lines, access roads, and within the solar site could result in direct mortality or injury of tortoises as a result of being crushed by vehicles. Desert tortoises are expected to re-inhabit the solar fields during operations, though how tortoises might utilize the remaining habitat within the solar fields is unknown at this time. However, the habitat within the solar fields would be left generally intact with fencing that would allow tortoise to move back into the areas. In addition, implementation of BMPs, such as conducting preconstruction surveys, biological monitoring during ground-disturbing activities, reduced speed limits, and environmental awareness training for personnel would minimize impacts to desert tortoises during O&M activities. Decommissioning would result in similar effects as those described for construction.

The Biological Assessments for the Projects determined that implementation of the Proposed Action may affect and is likely to adversely affect the Mojave desert tortoise (**Appendix M**). The Biological Opinions concluded that the Projects are not likely to jeopardize the continued existence of the desert tortoise (**Appendix N**). The Biological Opinions also concluded that the Proposed Action would result in take (primarily from capture) of all desert tortoises that occur within the fenced perimeter of the proposed solar facilities and in harm's way within the development areas of the collector lines and access road and areas where tortoise exclusion fencing would be installed. Table 10 of the Biological Opinions identifies the incidental take threshold for all age classes of desert tortoises during construction, O&M, and decommissioning activities.

The Proposed Action would have moderate, localized, short-term, direct and indirect, adverse impacts on Mojave desert tortoise during construction and decommissioning, and minor, localized, long-term, direct and indirect, adverse impacts on Mojave desert tortoise during O&M.

#### ***Southwestern Willow Flycatcher, Yellow-Billed Cuckoo, and Yuma Ridgway's Rail***

No suitable habitat for the southwestern willow flycatcher, yellow-billed cuckoo, or Yuma Ridgway's rail occurs within or adjacent to the Project area, though these species may use the nearby Muddy and Virgin Rivers for migration to and from breeding habitat and during dispersal, and these species may migrate over the Projects.

A portion of the collector lines may be constructed above ground where the lines cross the BLM-managed designated utility corridor. There is potential that southwestern willow flycatcher, yellow-billed cuckoo, and Yuma Ridgway's rail could collide with the aboveground electrical lines. However, the likelihood of this impact is very low due to the low probability of these birds occurring within the Project area.

Groundwater withdrawals proposed for the Projects may result in insignificant reductions in flow in the Muddy River, but the magnitude of effects to these species or their habitats would be too small to be discernable (i.e., there is not likely to be any effect on riparian vegetation along the Muddy River).

A migrating or dispersing southwestern willow flycatcher, yellow-billed cuckoo, or Yuma Ridgway's rail could collide with the PV solar panels, though this is expected to be extremely unlikely to occur. The specific routes of migrating and dispersing birds in this area are not known and we cannot predict the paths the birds may take. These birds may fly over the Project area but are not likely to utilize habitats that are present within the Projects due to a lack of suitable habitat. The USFWS recently addressed the potential for solar projects to cause injury or mortality to Yuma clapper rail and yellow-billed cuckoo: two mortalities of Yuma clapper rails and one yellow-billed cuckoo have been documented at solar facilities in California, although the circumstances and causes of death have not been confirmed (USFWS 2019a). For the ESMSP, located near to and within the same habitat as the SBSPs, the USFWS recognized that the low number of known recorded mortalities, the lack of habitat in the area, and the long distance from any known occurrence of these birds suggests low potential for direct mortality associated with solar projects in this area (USFWS 2019a). In addition, post-construction monitoring for the Southern Paiute Solar Project (located immediately adjacent to the SBSPs) from January 2017 to July 2019 found



a total of nine avian mortalities, none of which were federally listed bird species. Therefore, the potential for interactions between Yuma Ridgway's rail, southwestern willow flycatcher, and yellow-billed cuckoo and PV solar facilities are improbable when such projects are distant from this species' habitat, and therefore, effects are expected to be negligible.

Due to the low numbers of these three species that occur in the vicinity of the Projects and the lack of habitat in the lease option area, the potential for direct mortality and indirect impacts to these species is low, and the potential risk would be insignificant and discountable. The Biological Assessments for the Projects determined that the Proposed Action may affect, but is not likely to adversely affect, the southwestern willow flycatcher, yellow-billed cuckoo, and Yuma Ridgway's rail (**Appendix M**), and the USFWS concurred with this determination through informal consultation (**Appendix N**). The Proposed Action would have negligible, localized, short- and long-term, direct and indirect, adverse impacts on southwestern willow flycatcher, yellow-billed cuckoo, and Yuma Ridgway's rail.

#### ***Summary of Direct and Indirect Effects of the Proposed Action***

The Proposed Action would have no direct impacts on Moapa dace due to the lack of suitable habitat in the Project area, but would have minor, regional, short- and long-term, indirect, adverse impacts on the species due to the drawdown of water during construction, O&M, and decommissioning.

The Proposed Action would have moderate, localized, short-term, direct and indirect, adverse impacts on Mojave desert tortoise during construction and decommissioning due to harm, harassment, injury, and possible death to tortoise from ground-disturbing activities and tortoise translocation during construction, O&M, and decommissioning. The Proposed Action would have minor, localized, long-term, direct and indirect, adverse impacts on Mojave desert tortoise during O&M due to permanent disturbance of 794 acres of suitable habitat for desert tortoise. Direct and indirect impacts would be minimized through implementation of Project design features and BMPs (**Appendix B**), the Worker Environmental Awareness Program, and the Desert Tortoise Translocation Plan (**Appendix N**).

The Proposed Action would have negligible, localized, short- and long-term, direct and indirect, adverse impacts on southwestern willow flycatcher, yellow-billed cuckoo, and Yuma Ridgway's rail. Due to the low numbers of these three species that occur in the vicinity of the Projects and the lack of habitat in the lease option area, the potential for direct mortality and indirect impacts to these species would be insignificant and discountable.

#### ***Additional Measures to Avoid and/or Minimize Impacts***

With the implementation of the desert tortoise minimization measures, BMPs in **Appendix B** and other design features, no additional measures to minimize impacts are recommended. The USFWS did not recommend any additional reasonable and prudent measures with terms and conditions in the Biological Opinions (**Appendix N**) because USFWS believes the measures already proposed are adequate and appropriate.

#### **DIRECT AND INDIRECT EFFECTS OF THE NO ACTION ALTERNATIVE**

Under the No Action Alternative, the SBSPs would not be constructed and there would be no direct or indirect effects on any threatened, endangered, or candidate species.

## 3.6 Vegetation

### 3.6.1 Affected Environment

The Project area is located in the Mojave Warm Desert and Mixed Desert Scrub habitat (Wildlife Action Plan Team 2012), which includes the creosotebush, Joshua tree forest, and tall and short blackbrush plant communities. Together, in Nevada, these communities occupy more than 6.7 million acres of land in the Mojave Desert and more than 1.8 million acres in the Great Basin. Desert scrub plants are uniquely adapted to harsh conditions present in desert ecosystems, such as low humidity, prolonged droughts, desiccating winds, rocky or very sandy soils, and periodic flooding. Mojave Desert scrub vegetation supports a diverse array of wildlife species including many birds, small mammals, and reptiles that depend on or at least partially use this habitat (Wildlife Action Plan Team 2012).

Throughout the Mojave Desert, native understory vegetation is being replaced with invasive species such as red brome (*Bromus rubens*), cheatgrass (*Bromus tectorum*), Sahara mustard (*Brassica tournefortii*), halogeton (*Halogeton glomeratus*), and Russian thistle (*Salsola* spp.). Non-native annual grasses such as red brome, cheatgrass, and Mediterranean grass (*Schismus barbatus*) compete with native forage plants, and the fuel these plants create has led to increased fires in parts of the Mojave Desert where they were historically rare (Invasive Weed Awareness Coalition 2006). In riparian areas, dense stands of saltcedar (*Tamarisk* spp.) have replaced native riparian vegetation communities throughout much of the region. Climate change is also anticipated to have a significant effect on desert scrub communities; creosote-bursage communities will expand northward, while blackbrush communities will lose much of their shrub cover (Wildlife Action Plan Team 2012).

Land cover types were identified using the Southwest Regional Gap Analysis Project data (Lowry Jr. et al. 2005; U.S. Geological Survey [USGS] 2005), which uses satellite imagery to delineate land cover types (vegetation communities). Vegetation in the lease option area is primarily composed of Sonora-Mojave Creosotebush-White Bursage Desert Scrub ([creosote scrub] 87 percent), while North American Warm Desert Wash ([desert wash] 11 percent), and Sonora-Mojave Mixed Salt Desert Scrub ([salt scrub] 1 percent) account for the remainder of the vegetation in the lease option area. Very small areas of North American Invasive Southwest Riparian Woodland and Shrubland ([invasive riparian woodland] 15 acres) and North American Warm Desert Bedrock Cliff and Outcrop ([bedrock cliff and outcrop] 2 acres) are also present in the lease option area (**Figure 3-2**).

The Project area (which includes the area within the solar field fenceline, collector line ROWs, gen-tie ROW, and access road ROWs) has similar vegetation composition as the lease option area. Refer to **Table 3-8** and **Table 3-9** for acres of each vegetation community by land jurisdiction and Project component. Within the existing access road ROW, there are very small areas of North American Warm Desert Pavement ([desert pavement] 0.2 acre [0.1 on BIA-managed land and 0.1 acre on BLM-managed land]) and Developed Land (0.2 acre on BIA-managed land).

On the Reservation, the Project area is composed almost entirely of creosote scrub and desert wash, with salt scrub vegetation found only within the SBSP II solar field fenceline and access roads. A small area (10 acres) of invasive riparian woodland is found in the southern parcel of the SBSP I solar field. The bedrock cliff and outcrop communities occur within the lease option area but not within the Project area. **Figure 3-2** shows the distribution of vegetation communities in the vicinity of the solar fields. **Table 3-8** provides the acreage of the four predominant vegetation communities in the SBSP Project area on Reservation land, including associated access road and collector line ROWs.

On BLM-managed lands, the Project area includes existing access roads and gen-tie ROW on BLM land and existing access roads, gen-tie ROW, and collector line ROW on the Reservation within the BLM-managed

**Table 3-8. Major Vegetation Communities in the Project Area on BIA-managed Lands**

<b>Project Component</b>	<b>Creosote Scrub (acres)</b>	<b>Desert Wash (acres)</b>	<b>Salt Scrub (acres)</b>	<b>Invasive Riparian Woodland (acres)</b>	<b>Total (acres)</b>
<b>SBSP I</b>					
Solar Field <sup>1</sup>	2,367	223	0	10	2,600
Existing and New Access Road ROWs <sup>2,3</sup>	16	<1	<1	0	17
Collector Lines <sup>2</sup>	20	0	0	0	20
<b>SBSP I Total</b>	<b>2,402</b>	<b>223</b>	<b>&lt;1</b>	<b>10</b>	<b>2,637</b>
<b>SBSP II</b>					
Solar Field <sup>1</sup>	726	190	84	0	1,000
Existing and New Access Road ROWs <sup>2,3</sup>	14	<1	<1	0	15
Collector Lines	13	1	0	0	14
<b>SBSP II Total</b>	<b>752</b>	<b>191</b>	<b>86</b>	<b>0</b>	<b>1,029</b>

<sup>1</sup>The boundary of the solar fields in GIS data is slightly smaller than the stated size of the fenceline areas. The acres of each vegetation type in this additional area were estimated based on the GIS solar field percent cover of each vegetation type.

<sup>2</sup>If both Projects are approved and constructed, a portion of the access roads would be shared by both Projects. These shared areas have been included in the acreages for both Projects. Therefore, the total acreage of vegetation types within these areas is less than the sum of the acreages for each Project.

<sup>3</sup>The existing access road ROW that would be shared by both Projects also includes 0.1 acre of North American Warm Desert Pavement and 0.2 acre of Developed Land.

Source: Lowry Jr. et al. 2005; USGS 2005

**Table 3-9. Major Vegetation Communities in the Project Area on BLM-managed Lands**

<b>Project Component</b>	<b>Creosote Scrub (acres)</b>	<b>Desert Wash (acres)</b>	<b>Total (acres)</b>
<b>SBSP I</b>			
Existing Access Road ROWs on BLM land <sup>1,2</sup>	3	3	6
Existing Access Road in BLM-managed Utility Corridor <sup>1,2</sup>	31	11	42
Gen-tie ROW on BLM land <sup>1</sup>	3	<1	3
Gen-tie ROW in BLM-managed Utility Corridor <sup>1</sup>	80	18	98
Collector Lines in BLM-managed Utility Corridor	8	5	13
<b>SBSP I Total</b>	<b>125</b>	<b>37</b>	<b>162</b>
<b>SBSP II</b>			
Existing Access Road ROWs on BLM land <sup>1,2</sup>	3	3	6
Existing Access Road in BLM-managed Utility Corridor <sup>1,2</sup>	31	11	42
Gen-tie ROW on BLM land <sup>1</sup>	3	<1	3
Gen-tie ROW in BLM-managed Utility Corridor <sup>1</sup>	80	18	98
Collector Lines in BLM-managed Utility Corridor	5	2	7
<b>SBSP II Total</b>	<b>122</b>	<b>34</b>	<b>156</b>
<b>Total for SBSP I and SBSP II</b>			
<b>BLM Land Total<sup>1</sup></b>	<b>6</b>	<b>3</b>	<b>9</b>
<b>BLM-managed Designated Utility Corridor Total<sup>1</sup></b>	<b>124</b>	<b>36</b>	<b>160</b>

<sup>1</sup> If both Projects are approved and constructed, the entire gen-tie ROW and a portion of the access roads would be shared by both Projects. These shared areas have been included in the acreages for both Projects. Therefore, the total acreage of vegetation types within these areas is less than the sum of the acreages for each Project.

<sup>2</sup> The existing access road ROW that would be shared by both Projects also includes 0.1 acre of North American Warm Desert Pavement on BLM land.

Source: Lowry Jr. et al. 2005; USGS 2005

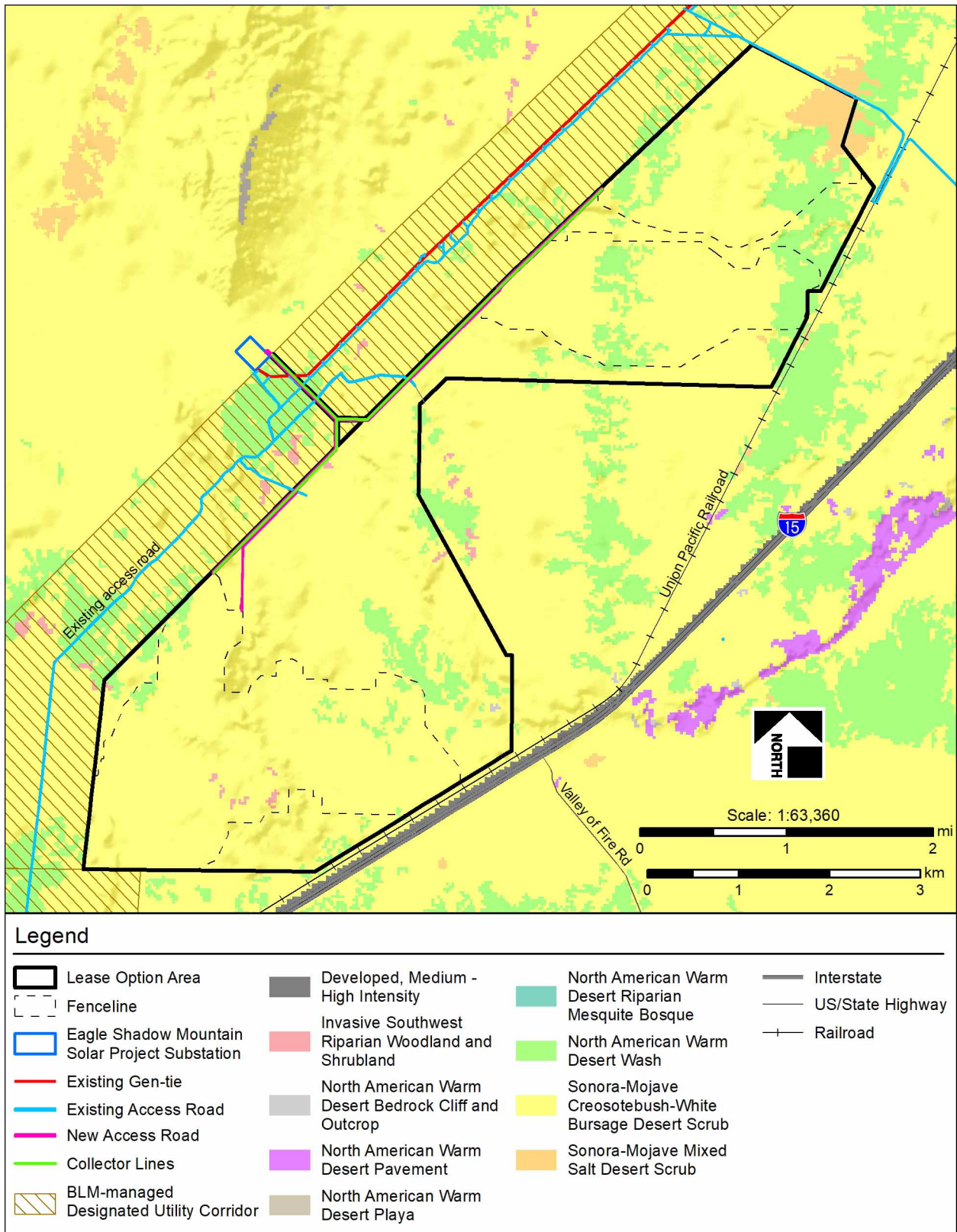


Figure 3-2. Vegetation Communities in the Project Lease Option Area and Project Area

designated utility corridor. The portion of existing access roads and gen-tie ROW on BLM land includes 6 acres of creosote scrub and 3 acres of desert wash vegetation. The portion of existing access roads, gen-tie ROW, and collector line ROW within the BLM-managed utility corridor includes 125 acres of creosote scrub and 37 acres of desert wash vegetation. **Table 3-9** provides the acreage of the four predominant vegetation communities in the SBSP Project area on BLM-managed land including associated access road and collector line ROWs.

### **SONORA-MOJAVE CREOSOTEBUSH-WHITE BURSAGE DESERT SCRUB**

Creosote scrub is typical of the Mojave Desert and is the most abundant vegetation community in the region and within the Project area. Creosote scrub occurs on well-drained sandy flats and bajadas from 150 to 1500 meters (492–4,921 feet) elevation in Nevada. Its range extends from the Colorado River on the south to Pahranaagat Valley on the north (Wildlife Action Plan Team 2012). This community is typically dominated by creosotebush (*Larrea tridentata*) and white bursage (*Ambrosia dumosa*), which can be sparse to moderately dense (2–50 percent cover). Many other shrubs, dwarf-shrubs, and cacti may be present, often as a sparse understory. In southern Nevada, common species include saltbush (*Atriplex* spp.), Mormon tea (*Ephedra nevadensis*), desert wolfberry (*Lycium andersonii*), brittlebush (*Encelia farinosa*), and beavertail cactus (*Opuntia basilaris*). The herbaceous layer is typically sparse but can be abundant with ephemerals after spring rains. Herbaceous species common in the region include phacelia (*Phacelia* spp.), desert trumpet (*Erigonium inflatum*), cryptantha (*Cryptantha* spp.), and low woollygrass (*Dasyochloa pulchella*) (USGS 2005).

Creosotebush is used by many desert animals for shelter and forage. The roots of the creosotebush help to stabilize the soil and support burrows for a variety of reptiles and amphibians, including the desert tortoise (*Gopherus agassizii*), and mammals such as the kit fox (*Vulpes macrotis*). Other animals bed in or under the bushes and birds use them for perching and nesting (Wildlife Action Plan Team 2012).

On the Reservation, the Project area includes 2,402 acres of creosote scrub vegetation for SBSP I and 752 acres for SBSP II (14 acres of the access roads are shared by both Projects). On the Reservation within the BLM-managed designated utility corridor, the Project area includes 124 acres of creosote scrub vegetation for both Projects. On BLM land, the Project area includes 6 acres of creosote scrub vegetation shared by both Projects).

### **NORTH AMERICAN WARM DESERT WASH**

The desert wash vegetation community is restricted to the small, intermittently flooded washes scattered throughout the Project area; it is more prevalent in the SBSP II solar field and the northern parcel of the SBSP I solar field than in the southern parcel of the SBSP I solar field. The vegetation of desert washes is highly variable, ranging from sparse and patchy to moderately dense. It typically occurs along the banks of washes but may occur within the channel. The woody layer is typically intermittent and relatively open and is usually dominated by shrubs and small trees such as catclaw (*Senegalia greggii*) and desert willow (*Chilopsis linearis*) (USGS 2005). In southern Nevada, washes tend to support a higher diversity and density of cacti and yucca than the surrounding landscape. Vegetation surveys conducted for previously approved solar projects on the Reservation (BIA 2012a, 2014, 2019a) identified numerous cacti and yucca species including cholla (*Cylindropuntia* spp.), barrel cactus (*Ferocactus cylindraceus*), hedgehog cactus (*Echinocereus engelmannii* var. *chrysocentrus*), and Mojave yucca (*Yucca schidigera*). Higher densities of big galleta grass (*Pleuraphis rigida*) are also commonly reported in washes in this region.

On the Reservation, the Project area includes 223 acres of desert wash vegetation for SBSP I and 191 acres for SBSP II. On the Reservation within the BLM-managed designated utility corridor, the Project area includes 36 acres of desert wash vegetation for both Projects combined. On BLM land, the Project area includes 3 acres of desert wash vegetation shared by both Projects.

### **SONORA-MOJAVE MIXED SALT DESERT SCRUB**

This community is typical of saline basins in the Mojave Desert and most often occurs around the edge of playas. Vegetation is typically composed of one or more saltbush species and other halophytic (salt tolerant) plants such as iodinebush (*Allenrolfea occidentalis*), seepweed (*Suaeda* spp.), and alkali sacaton (*Sporobolus airoides*) (USGS 2005). Salt scrub vegetation is restricted to a portion (84 acres) in the north of the SBSP II solar field fenceline on Reservation land, less than 1 acre of existing access roads on Reservation land, and 1 acre of new access road on Reservation land. This vegetation type does not occur within the Project area on BLM-managed land.

### **NORTH AMERICAN INVASIVE SOUTHWEST RIPARIAN WOODLAND AND SHRUBLAND**

This community represents areas that are dominated by introduced woody species such as saltcedar and Russian olive (*Elaeagnus angustifolia*) (USGS 2005). Due to the lack of perennial water in the Project area, this vegetation is limited to 10 acres that includes a few small patches of saltcedar along larger drainages in the southern parcel of the SBSP I solar field on Reservation land. This vegetation type does not occur within the Project area on BLM-managed land.

### **NORTH AMERICAN WARM DESERT BEDROCK CLIFF AND OUTCROP**

This vegetation community includes barren, sparsely vegetated (less than 10 percent cover) landscapes of cliff faces, narrow canyons, and smaller outcrops of various bedrock types, as well as scree and talus slopes. Although vegetation density may be low, species diversity can be high, and may include beargrass (*Nolina bigelovii*), teddybear cholla (*Cylindropuntia bigelovii*), and other succulents. Lichens may be the predominant life form in some areas, and small patches of shrubs from adjacent areas may also be present (USGS 2005). This vegetation community occupies a very small portion (2 acres) on the Reservation outside of the Project area but within the lease option area to the east of the southern parcel of the SBSP I. This vegetation type does not occur within the Project area on BLM-managed land.

### **NORTH AMERICAN WARM DESERT PAVEMENT**

The desert pavement community is composed of unvegetated to sparsely vegetated (<2 percent) landscapes. This community is common in flat, open basins where exposure to wind has developed a cover of fine to medium gravel coated with “desert varnish.” These areas are subject to extreme temperature variation and support very limited populations of desert scrub species such as creosotebush and Eastern Mojave buckwheat (*Eriogonum fasciculatum*). However, these areas may briefly experience high densities of ephemeral herbaceous vegetation following seasonal precipitation events (USGS 2005). This vegetation community only occurs along existing access roads that connect to the Projects, with a total of 0.2 acre within the Project area (0.1 acre on BIA-managed land and 0.1 acre on BLM land).

## **3.6.2 Environmental Consequences**

### **DIRECT AND INDIRECT EFFECTS OF THE PROPOSED ACTION**

Under the Proposed Action, vegetation would be permanently cleared from new access roads, O&M building sites, inverter pads, tracker foundations, the collector line ROWs, and other areas where grading is necessary to provide a level surface. This would cause the direct, long-term loss of approximately 501 acres of vegetation in the SBSP I Project area and 297 acres in the SBSP II Project area. Of this, the majority of vegetation disturbance is on Reservation land, with only 20 acres of disturbance in the collector line ROW (13 acres for SBSP I and 7 acres for SBSP II) on the Reservation within the BLM-managed designated utility corridor (all vegetation within

the BLM-managed portion would be permanently disturbed). The vast majority (85 percent) of permanent vegetation removal would occur within the creosote scrub vegetation community.

During construction, vegetation within the solar blocks may be trimmed to a height of 18 inches, where necessary. Construction equipment would drive over and crush trimmed and un-trimmed vegetation where necessary, but the root systems would remain largely intact, which would allow vegetation to regrow more quickly than graded areas within the solar blocks during O&M. Where trenches are excavated for the installation of electrical conduits, vegetation would take longer to regrow due the destruction of root systems. Vegetation would also be cleared from staging areas during construction, but these areas would not be graded or compacted. The staging areas would be developed into solar blocks, where practicable, and vegetation would be allowed to regrow in the same manner as the other solar blocks. These construction activities would potentially temporarily disturb the entire solar field areas remaining within the fenceline outside areas of permanent disturbance (2,141 acres for SBSP I and 731 acres for SBSP II). See Sections 2.1.1 and 2.1.3 for a detailed description of onsite facilities. **Table 3-10** lists permanent and temporary disturbance within each vegetation community for SBSP I and SBSP II, respectively.

Construction of collector lines and associated access roads would require vegetation clearing. The Applicants intend to construct the collector lines for both Projects entirely underground. However, a portion of the collector lines may be constructed overhead where the lines cross the BLM-managed designated utility corridor to avoid conflicts with existing underground utilities. Regardless of whether the lines are constructed underground or overhead, it is assumed that the entire collector line ROW would be permanently disturbed. This includes 20 total acres of permanent disturbance to vegetation within the BLM-managed designated utility corridor (13 acres for SBSP I and 7 acres for SBSP II) and 34 acres of permanent disturbance on the Reservation (20 acres for SBSP I and 14 acres for SBSP II). A detailed description of the collector lines is provided in Sections 2.1.2 and 2.1.3. **Table 3-10** lists permanent disturbance within each vegetation community within the collector line ROW for SBSP I and SBSP II, respectively. Because the entire collector line ROW will be permanently disturbed there is no temporary disturbance associated with the collector line ROWs. However, for areas within the collector line ROWs that will not be trenched or are not included as part of access, construction equipment would drive over and crush vegetation where necessary, but the root systems would remain largely intact, which would allow vegetation to regrow during O&M.

Access to the solar fields would primarily use existing roads. Although these roads may require some maintenance during construction, O&M, and decommissioning, no roadway widening would be required, and there is no new disturbance associated with the use of these roads. Construction of new offsite access roads would be needed to connect the solar fields to the existing Southern Paiute Solar Project. This would temporarily disturb approximately 2 acres of vegetation for SBSP I and 2 acres for SBSP II and would permanently disturb approximately 7 acres of vegetation for SBSP I and 5 acres for SBSP II, all located on Reservation land. If both Projects are approved and constructed, they would share 4 acres of the new offsite access roads; therefore, the total area of permanent disturbance for both Projects would only be 8 acres. See Sections 2.1.2 and 2.1.3 for a detailed description of access roads. Permanent and temporary disturbance within each vegetation community due to the construction of new offsite access roads is listed in **Table 3-10**.

The vast majority of temporary and permanent disturbance to vegetation is located on Reservation land managed by the BIA. The only Project components on BLM land are existing access roads and the gen-tie line constructed for the previously approved ESMSP. Neither the use of existing access roads nor the gen-tie line on BLM lands will result in any new ground disturbance.



**Table 3-10. Temporary and Permanent Disturbance by Vegetation Community**

<b>Vegetation Community</b>	<b>Solar Fields<sup>1</sup> Temporary Disturbance Acres</b>	<b>Solar Fields<sup>1</sup> Permanent Disturbance Acres</b>	<b>Collector Lines<sup>2</sup> Permanent Disturbance Acres</b>	<b>New Access Roads<sup>3</sup> Temporary Disturbance Acres</b>	<b>New Access Roads<sup>3</sup> Permanent Disturbance Acres</b>	<b>Total Temporary Disturbance Acres</b>	<b>Total Permanent Disturbance Acres</b>
<b>SBSP I</b>							
Invasive Riparian Woodland	8	2	<1	0	0	8	2
Desert Wash	184	40	5	0	0	184	45
Creosote Scrub	1,947	419	28	2	7	1,949	454
<b>SBSP I Total<sup>4</sup></b>	<b>2,139</b>	<b>461</b>	<b>33</b>	<b>2</b>	<b>7</b>	<b>2,141</b>	<b>501</b>
<b>SBSP II</b>							
Desert Wash	138	51	3	<1	<1	138	54
Creosote Scrub	529	197	18	2	5	531	220
Salt Scrub	62	23	0	0	0	62	23
<b>SBSP II Total<sup>4</sup></b>	<b>729</b>	<b>271</b>	<b>21</b>	<b>2</b>	<b>5</b>	<b>731</b>	<b>297</b>
<b>Total for SBSP I &amp; SBSP II<sup>3</sup></b>	<b>2,868</b>	<b>732</b>	<b>54</b>	<b>3</b>	<b>8</b>	<b>2,871</b>	<b>794</b>

<sup>1</sup>Solar fields consist of solar blocks, internal access roads, O&M buildings, parking areas, temporary laydown yards, and perimeter fence. Disturbance acreages for each vegetation type were estimated based on the percentage of each type present in the solar field lease area.

<sup>2</sup>It is assumed the entire collector line ROW would be permanently disturbed. Of the 54 acres of collector line permanent disturbance, 20 acres (13 acres for SBSP I and 7 acres for SBSP II) are within the BLM-managed designated utility corridor.

<sup>3</sup>Disturbance is not anticipated for existing access roads, and thus existing roads are not included in this table. If both Projects are approved and constructed, a portion of new access roads to the solar fields would be shared by both Projects. The permanent disturbance for these shared areas (approximately 4.0 acres) is included in the disturbance estimates for both Projects. Therefore, the total permanent disturbance for both Projects would be slightly less than the sum of disturbance for each Project. **There is no disturbance (temporary or permanent) anticipated for access roads on BLM land and BLM-managed land because only existing access roads are proposed on these lands.**

<sup>4</sup>Some columns may not add up to the total due to rounding errors.

Thus, there will be no temporary or permanent disturbance to vegetation on BLM land as a result of the Projects. Construction of the collector lines within the BLM-managed designated utility corridor on the Reservation would permanently disturb 20 acres of vegetation (13 acres for SBSP I and 7 acres for SBSP II).

During O&M, vegetation throughout the solar fields would be managed and trimmed as needed to facilitate maintenance activities, reduce fire risk, and allow the solar panel tracking system to operate properly. Repeated crushing and trimming would directly impact vegetation by depleting carbohydrate reserves stored in roots and causing metabolic stress that may lead to the mortality of some plants.

Indirect impacts to vegetation from construction, O&M, and decommissioning of the SBSPs are primarily associated with soil disturbance and vegetation management. Soil disturbance from ground-disturbing activities and the use of vehicles and heavy equipment in the solar fields and collector line ROW has the potential to reduce the native seed bank and could introduce or spread invasive plant species and noxious weeds. Reduction of native plant cover could leave bare areas that would be susceptible to the establishment of invasive plant species and noxious weeds and increased erosion.

Invasive plant species and noxious weeds may be transported to the site in hay bales and straw wattles used for erosion control and construction equipment and vehicles, if not properly cleaned. Repeated crushing and trimming of vegetation within the solar fields, shading by solar panels, and changes in surface water flow could create conditions that are more favorable for non-native plants, including invasive plant species and noxious weeds.

Dust generated by construction, O&M, and decommissioning activities, and by vehicles and equipment travelling on access roads, could also indirectly affect vegetation by reducing photosynthetic activity. Some of these effects could extend to vegetation outside the Project area. The implementation of dust control measures (**Appendix B**) would minimize the potential effects to vegetation. Water for dust suppression, panel washing, and domestic use would be transported to storage tanks at the solar fields by truck from an existing water right owned by the Moapa Band. No groundwater wells would be installed in the Project area and there would be no effect on vegetation from reduced groundwater availability. However, the introduction of water to the sites for panel washing and dust control could alter the composition of vegetation communities by providing a competitive advantage to species that thrive in wetter conditions. Invasive plant species and noxious weeds could also benefit from additional moisture and could potentially outcompete native vegetation adapted to xeric conditions. No water diversions or stormwater retention ponds would be constructed for the Projects, so there would be no indirect effects on downstream vegetation from altered or reduced surface water flows.

The implementation of design features and BMPs (**Appendix B**) would reduce the potential for adverse effects to vegetation. Invasive plant species and noxious weeds within the Project area would be managed with mechanical treatments whenever possible; however, herbicides approved by the Moapa Band and/or BLM (as appropriate) would be used if necessary. The treatment (mechanical or chemical) of invasive plant species and noxious weeds could result in inadvertent injury to native plants that are in close proximity. The Applicants have developed an Integrated Weed Management Plan (**Appendix E**) that specifies procedures for managing vegetation and minimizing the spread of invasive plant species and noxious weeds.

Prior to the end of the 50-year lease for the Projects, the solar fields would be taken out of service and associated onsite and offsite facilities would be removed. Some buried components (such as cabling) may be left in place. The Applicants have prepared a draft Decommissioning Plan (**Appendix F**) to minimize the adverse effects of the permanent closure of the facilities. The final Decommissioning Plan would be developed near the time of decommissioning in coordination with the Moapa Band and BIA with input from other agencies. The collector lines would also be taken out of service and removed from the BLM-managed designated utility

corridor in accordance with local, State, and federal regulations, though underground cabling may be left in place. Following decommissioning, all disturbed areas would be stabilized and revegetated using BIA- and/or BLM-approved native seed mixes, as appropriate. Seeding would utilize a variety of techniques and would be timed to ensure optimal regrowth of vegetation. The area of temporary vegetation disturbance associated with decommissioning would be comparable to the area temporarily disturbed during construction. No new, permanent vegetation disturbance would result from decommissioning activities.

### ***Summary of Direct and Indirect Effects of the Proposed Action***

The implementation of the Proposed Action, including both onsite and offsite facilities, would result in the temporary loss of approximately 2,871 acres of vegetation and the permanent loss of 794 acres of vegetation (all of the temporary disturbance is on Reservation land; 20 acres of the permanent disturbance is in the BLM-managed designated utility corridor; and the remainder of permanent disturbance [774 acres] is on the Reservation). The vast majority of vegetation loss would occur within the creosote scrub vegetation community and would represent a tiny fraction of available creosote scrub in habitat in the region (0.2 percent of the watersheds the Projects fall within). Therefore, with the implementation of design features and BMPs (**Appendix B**), the Proposed Action would have minor, localized, short- and long-term, direct, adverse impacts on vegetation.

There may be indirect effects to vegetation such as shifts in the composition of vegetation communities due to vegetation management practices, increased water inputs in the Project area, and the potential introduction or spread of invasive plant species and noxious weeds. Fugitive dust generated by Project activities could reduce the photosynthetic activity of plants in and around the Project area. The Proposed Action would not lead to noticeable changes in surface water flows or groundwater availability and would not have an impact on downstream vegetation. Project design features and BMPs (**Appendix B**) and the implementation of the Integrated Weed Management Plan (**Appendix E**) would further reduce potential indirect impacts to vegetation. Therefore, the Proposed Action would have minor, localized, short- and long-term, indirect, adverse impacts on vegetation.

### ***Additional Measures to Avoid and/or Minimize Impacts***

With the implementation of the BMPs and other design features in **Appendix B**, no additional measures to minimize impacts are recommended.

## **DIRECT AND INDIRECT EFFECTS OF THE NO ACTION ALTERNATIVE**

Under the No Action Alternative, the Moapa Band would not approve leases for the SBSPs, and the solar fields would not be constructed. The BLM would not approve the ROW amendment, and the collector lines and associated access roads would not be constructed. There would be no temporary or permanent removal of vegetation, and vegetation would not need to be trimmed for the O&M of the solar fields. Therefore, there would be no direct impacts to vegetation under the No Action Alternative.

Existing roads would continue to be used by vehicles and recreationists for access to the previously approved solar facilities nearby. The composition of vegetation communities in the Project area would not shift as result of Project activities, and there would be less impacts from fugitive dust. The Integrated Weed Management Plan would not be implemented in the Project area, and invasive plant species and noxious weeds would be managed in accordance with existing practices on the Reservation and within the BLM-managed designated utility corridor. Although there would be less potential for the introduction and spread of invasive plant species and noxious weeds as compared to the Proposed Action, existing vegetation management practices would provide

less control of these species. Therefore, there would be negligible, localized, long-term, indirect, adverse and beneficial impacts under the No Action Alternative.

### 3.7 Visual Resources

The term “visual resources” refers to the composite of basic terrain, geologic, and hydrologic features; vegetative patterns; and built features that influence the visual appeal of a landscape. Visual impacts are defined as the change to the visual environment resulting from the introduction of modifications to the landscape. This section describes the existing context of the visual environment and assesses the potential impacts from the Proposed Action and the No Action Alternative within the visual resource study area, including impacts to views from the Moapa Travel Center, I-15, Valley of Fire Road, and the Old Spanish National Historic Trail (OSNHT). Due to the relatively flat, expansive landscape and low profile of the proposed solar facilities, a 10-mile buffer around the lease option area has been selected for the visual resource study area. This is the distance at which the casual observer may begin to perceive the proposed solar arrays in contrast with the existing surrounding landscape of the Project vicinity. The visual resource study area includes BLM lands associated with the existing gen-tie line and access roads, as well as the proposed collector lines and existing access roads within the BLM-managed designated utility corridor.

#### 3.7.1 Affected Environment

The visual resource study area lies within the Basin and Range physiographic province and is characterized by steep, narrow, isolated mountain ranges—generally on a north-south axis—separated by wide, flat, sediment-filled valleys or basins (Britannica 2020). It is located on the flat to gently sloping terrain of the Dry Lake Valley on the edge of the Great Basin Desert and Mojave Desert where the ground consists primarily of buff- and khaki-colored sands with varying degrees of red and pink tones with darker grey rocks and gravel. The vegetation is well-spaced and made up predominantly of mid-height, olive-green creosotebush and scattered taller, bright green mesquite and yellow-green yucca. Indistinct, low yellow grasses and grey-green shrubs (white bursage) make up most of the ground cover, intermixing with the taller vegetation and exposed soils.

The notable natural features within the visual resource study area include three mountain ranges—the Arrow Canyon Range to the west, the Dry Lake Range to the south, and the foothills of the North Muddy Mountains to the east. All three mountain ranges are rugged and exposed with hard angles and blocky shapes that consist of dark greys and browns with sharply contrasting tan and light brown sections that add to the visual depth of the landforms. The built features within the visual resource analysis area are notable and consist of two solar projects, an electrical substation, five electrical generating stations (coal and gas), several large transmission line corridors with varying sizes and types of structures (e.g., H-frame, lattice, monopole), two major transportation corridors, a railroad, and two travel centers (**Figure 3-3**). Within the BLM-managed designated utility corridor, there are approximately 500 existing wood and metal overhead structures, including H-frames, lattices, and monopoles.

The existing landscape character and condition of the lease option areas and the BLM-managed lands (collectively analyzed as the visual resource study area) is identified in terms of general landforms, vegetation, built features, and land use by visual analysis units (VAUs). The VAU delineations are based on areas with common landform patterns and features, vegetation communities and patterns, built features, land use patterns, scarcity, and/or surface water resources in relation to the Basin and Range physiographic province. Three VAUs were delineated within the visual resource study area (**Figure 3-4**). VAU 1 is a slightly undulating to moderately hilly landscape made up of khaki, brown, and orange soils and gravel which is crossed by several drainages of varying sizes (**Photograph 3-1**). The vegetation is predominantly mid-height (4 to 6 feet) olive-green creosotebush; short, (1 to 3 feet) grey-green white bursage; and low, (less than 1 foot) yellow grasses with

spotty yellow-green yucca and taller (6 to 8 feet) bright-green mesquite trees which are denser along the drainages. VAU 2 is made up of the intervening flat-topped, buff- and khaki-colored landforms with orange, red, white, and brown exposed slopes and drainages where the landforms transition to the lower, flatter portions of the visual resource study area (**Photograph 3-2**). The vegetation of VAU 2 is shorter in stature than VAU 1, consisting primarily of low, grey-green white bursage and short, yellow grasses, with less dense creosotebush and sparse yucca and mesquite as compared to VAU 1. VAU 3 is much more varied topographically than the other two VAUs and consists of light tan-colored rounded to pyramidal and trapezoidal landforms with darker brown and grey exposed rock slopes and intervening flat drainages. The vegetation of the landforms is very similar to that of VAU 2, made up primarily of low grasses and mid-height creosotebush, but is more prevalent in the intervening drainages, consisting of yellow grasses, grey-green and dark green shrubs, olive-green creosotebush, and scattered taller trees (**Photograph 3-3**).

In general, the overall scenic quality<sup>2</sup> of the visual resource study area has low scenic value due to the lack of variety and distinctiveness of the landforms and vegetation when compared to the region in which it occurs. The existing cultural modifications present within and directly adjacent to the visual resource study area (e.g., multiple transmission structures and lines, Southern Paiute Solar Project, and Crystal Substation) are notable and prominent disturbances that attract attention away from the natural landscape.

Key sensitive viewing platforms (SVPs) are critical viewpoints where there is public sensitivity to visual change in the landscape. Visual sensitivity reflects attitudes and perceptions held by people regarding the landscape and, in general, reflect the public's level of sensitivity to noticeable change to the landscape. Four SVPs were selected within the visual resource analysis area (**Figure 3-5**) that represent viewing locations where the public would view the SBSPs from a stationary (e.g., rest stop or scenic overlook) or a linear (e.g., highway or trail) location. The primary viewers are local and regional as well as interstate motorists who are traveling through the analysis area, visiting recreation areas, or making brief stops at travel centers. The SVPs that were selected include the Moapa Travel Center, I-15, Valley of Fire Road, and the OSNHT. For the I-15, Valley of Fire Road and OSNHT linear SVPs, the entire length of the route/trail within the visual resource analysis area was evaluated, not just a single viewing point location. US 93 is present within the visual resource analysis area, but views from it are blocked by the Arrow Canyon Mountain Range.

Additionally, the Proposed Action would be substantially blocked from views from the Loves Travel Center by existing structures associated with the Western Mining and Minerals facility north of the travel center and multiple transmission line towers and would not be visible by the casual observer. The Moapa Travel Center stationary SVP gets a large number of visitors who stop there while traveling on I-15. This platform is located approximately 0.3 mile southeast of the visual resource study area.

I-15 is a major interstate freeway connecting five western states and several large metropolitan areas and passes predominantly north-south through the Dry Lake Valley and the Reservation. The I-15 linear SVP was selected due to the large amount of vehicular traffic associated with the interstate. The I-15 linear platform is located approximately 0.1 mile southeast of the visual resource study area at its closest point and extends a total of approximately 27.5 miles within the visual resource study area.

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<sup>2</sup>Scenic or visual quality is the visual appeal of a landscape. The landscape is measured in terms of its distinctiveness (or memorability), scarcity, and variety of the landform, vegetation, water, color, adjacent scenery, and man-made features and how well these features fit together. The landscapes considered to have the highest scenic quality are those which exhibit the most distinctiveness and variety.

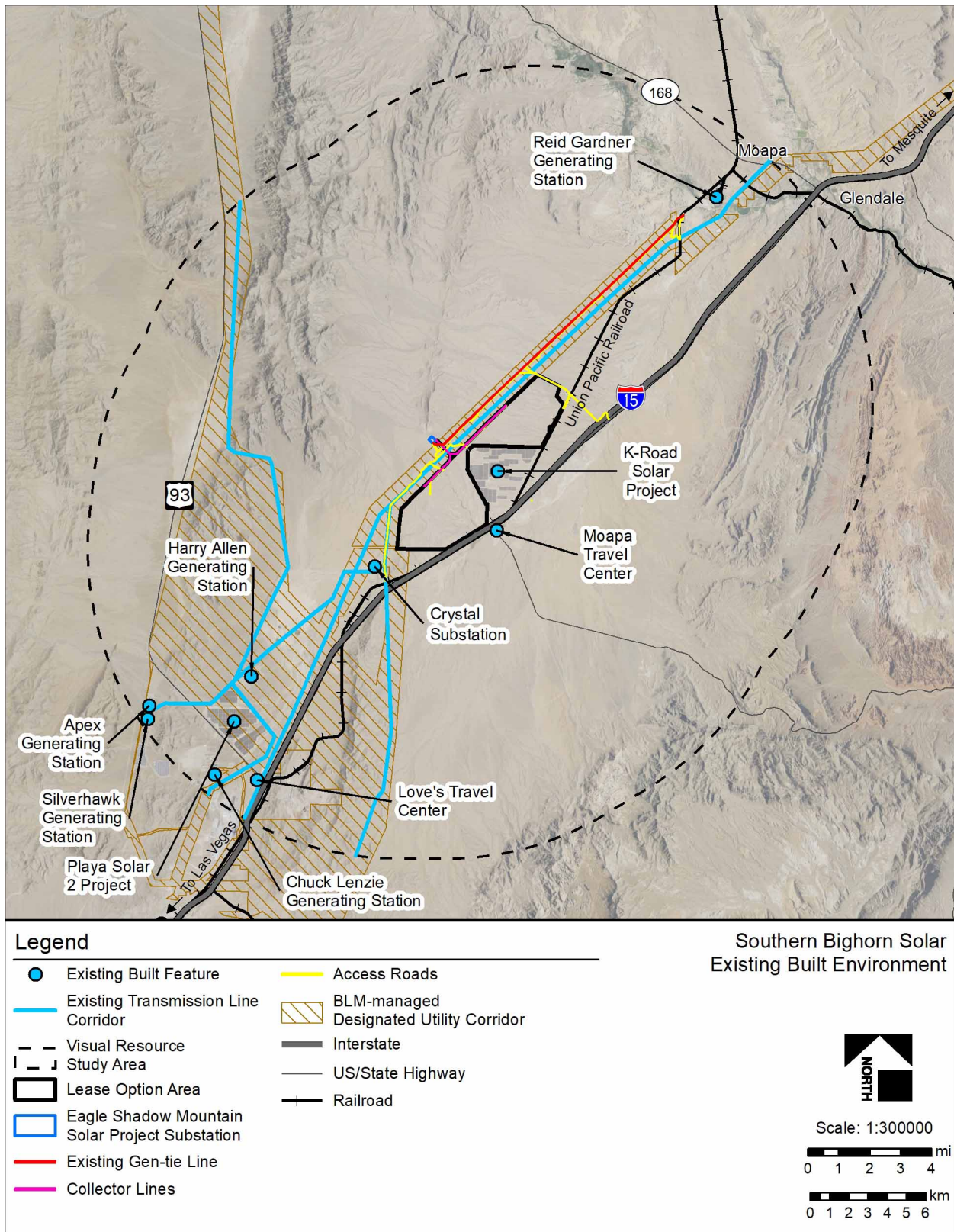


Figure 3-3. Southern Bighorn Solar Project Existing Built Environment

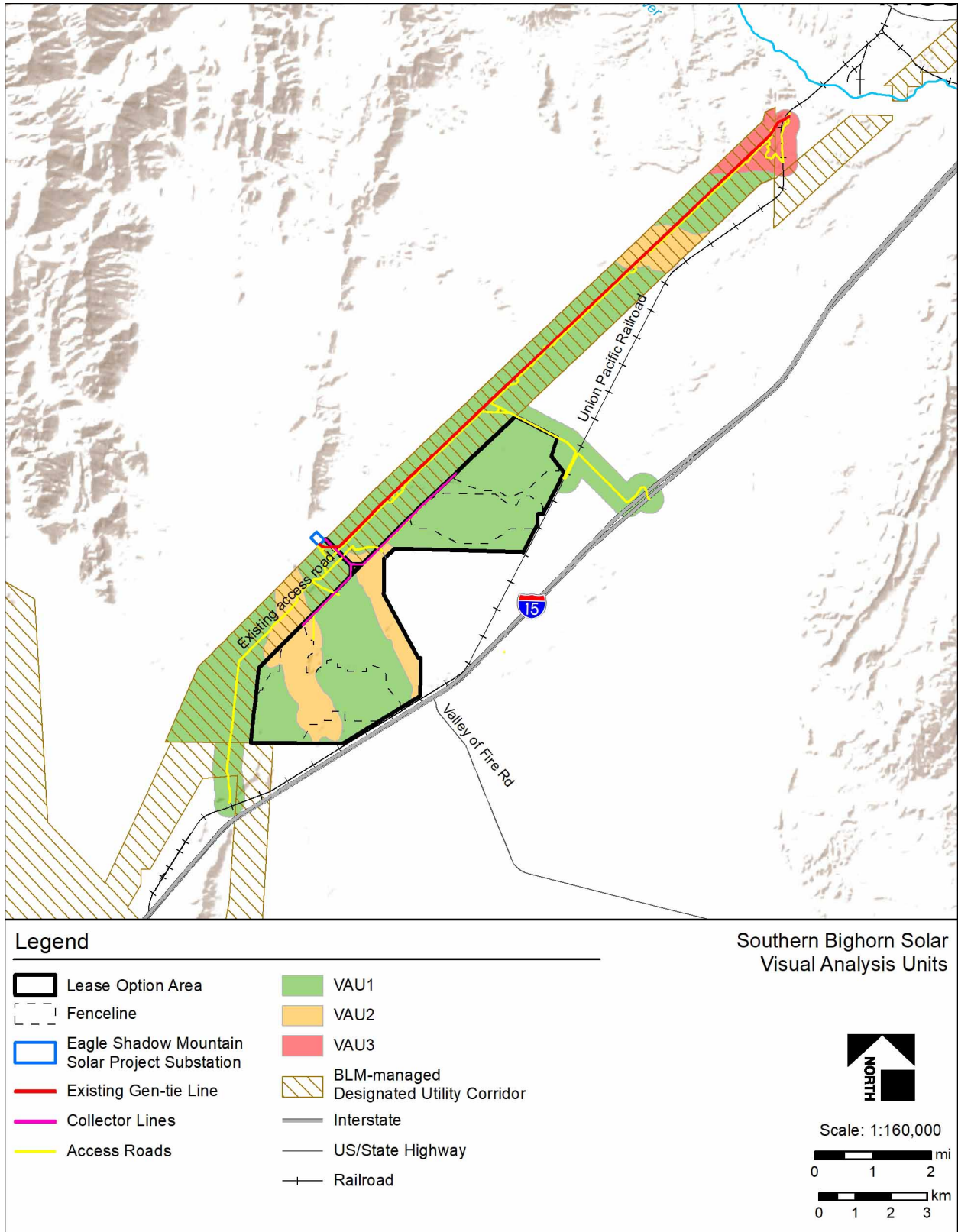


Figure 3-4. Southern Bighorn Solar Project Visual Analysis Units (VAUs)



**Photograph 3-1. VAU 1 Representative Landscape**

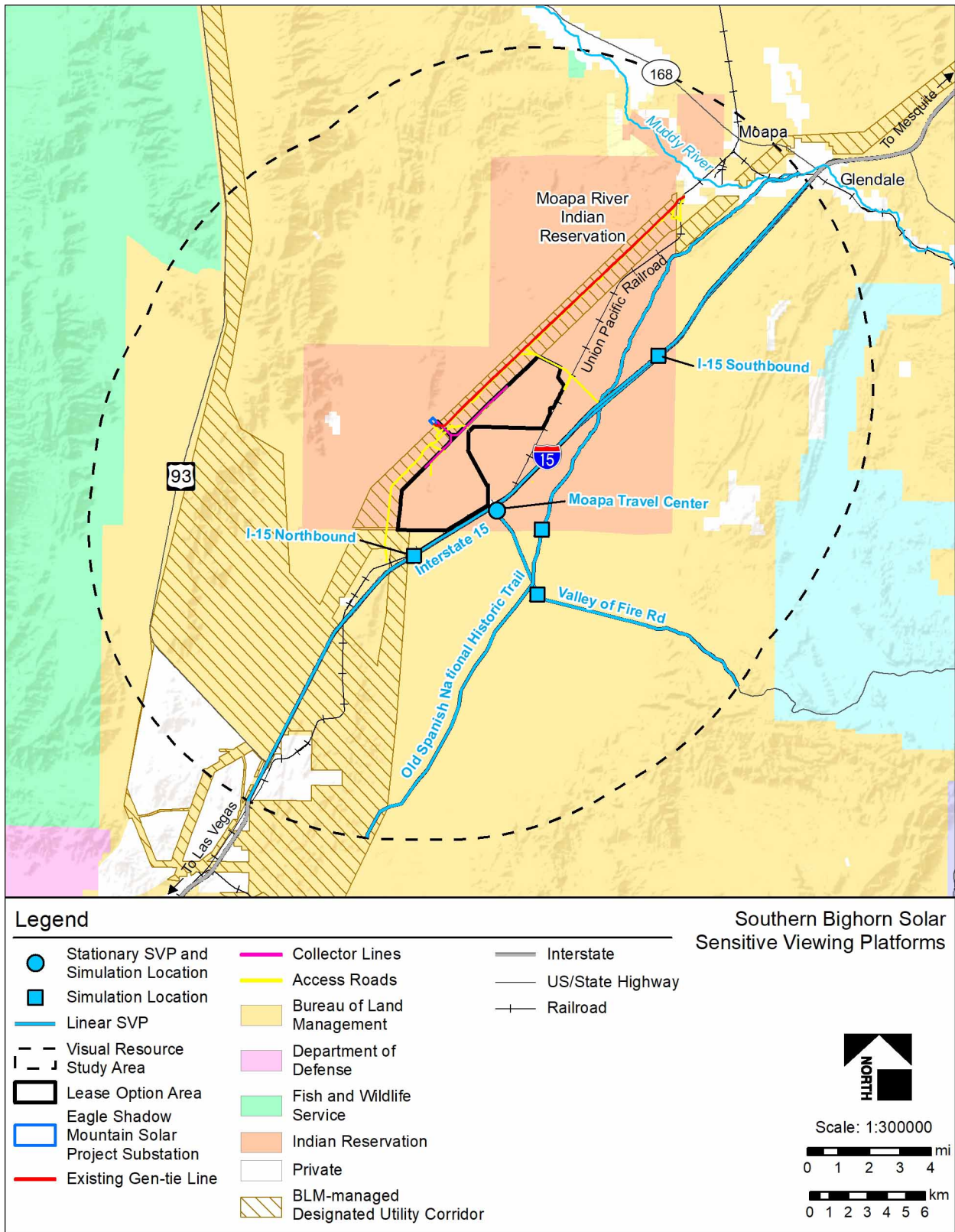


**Photograph 3-2. VAU 2 Representative Landscape**





**Photograph 3-3. VAU 3 Representative Landscape**



**Figure 3-5. Southern Bighorn Solar Project Sensitive Viewing Platforms (SVPs)**

Valley of Fire Road is the route which connects I-15 to Valley of Fire State Park to the east of the visual resource study area. The Valley of Fire Road linear SVP was selected due to the volume of vehicular traffic associated with the roadway and the local importance of the road. The platform is located approximately 0.1 mile southeast of the visual resource study area at its closest point and extends a total of approximately 10.8 miles within the visual resource study area.

The Old Spanish Trail is a historical route which connected settlements in New Mexico to southern California and crosses six southwestern/western states. The Old Spanish Trail was used extensively in the nineteenth century by pack trains and is a Congressionally designated National Historic Trail that is managed by the National Park Service and BLM. The OSNHT linear SVP was selected due to the sensitivity of the trail to the visual effects of the Projects and its national importance as part of the National Historic Trails system. The platform is located approximately 1.3 miles east of the visual resource study area at its closest point and extends a total of approximately 27.1 miles within the visual resource study area.

### 3.7.2 Environmental Consequences

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

#### DIRECT AND INDIRECT EFFECTS OF THE PROPOSED ACTION

Under the Proposed Action, short-term impacts to the existing landscape character and scenic quality would occur during construction from the generation of fugitive dust, movement of equipment and vehicles in and out of the visual resource study area, and stockpiling of materials. These short-term impacts may last from 14 to 26 months, depending on the sequencing of Project construction. The construction activities would introduce forms, lines, colors, and textures that would temporarily attract attention and create strong contrast<sup>3</sup> with the existing setting. Vegetation clearing and grading would expose lighter-color soils and create a more uniform landform in the cleared and graded areas for the PV solar panel blocks, collector lines (underground and overhead), O&M building, and new access roads. The short-term, construction-related impacts would depend on the sequencing of Project construction, viewing distance, type of construction activity taking place, visibility conditions, and time of day.

Long-term impacts that would occur as a result of the O&M of the SBSPs include changes to the existing landscape character and scenic quality of the Project area. The Proposed Action would introduce elements (i.e., PV solar panels) not currently present within the visual resource study area, although these elements are found directly adjacent within the analysis area. The proposed fencing, solar panel blocks, and O&M building would appear to substantially alter the landscape and would be visually prominent within the foreground/middleground zone<sup>4</sup> of the visual resource study area. The Project components would introduce cultural modifications that would reduce the overall scenic quality of the landscape because they introduce features that would be visually discordant and contrast with other elements and patterns in the landscape within the visual resource study area. The spatial dominance of the Proposed Action and the uniform,

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<sup>3</sup> Degrees of contrast align with magnitudes of impact as follows: “Low” impact = “Weak” contrast; “Moderate” impact = “Moderate” contrast; “Major” impacts = “Strong” contrast.

<sup>4</sup> Viewing distances within the visual resource analysis area are divided into two zones based on distance: foreground/middleground (0-5 miles) and background (5-15 miles).

rectangular form and the color of the panels would attract attention. The new access roads would be similar to existing features within the visual resource study area and would not attract attention of the casual observer.

The proposed collector lines would include up to 57 wooden H-frame poles for SBSP I and 20 wooden H-frame poles for SBSP II constructed within the BLM-managed designated utility corridor. The addition of 77 wooden H-frame poles would introduce vertical forms, dark colors, and coarse textures that would be clustered together in one area within the utility corridor. These elements, while common in the visual resource study area, would notably change the existing landscape character and lower the scenic quality by increasing the scale and spatial dominance of cultural modifications in the visual resource study area. The collector line poles would create weak contrast, subordinate to other existing elements and patterns in the landscape. The wooden H-frame poles would not attract the attention of the casual observer within the foreground/midground zone of the Proposed Action because of the prominence of existing transmission structures within the BLM-managed designated utility corridor.

#### ***Effects on Views from the Moapa Travel Center SVP***

The Proposed Action would be visible from the Moapa Travel Center SVP in the foreground/midground (**Photograph 3-4** and **Photograph 3-5**), primarily to the west of this SVP. From the Moapa Travel Center SVP, approximately 8 percent (285 acres) of the Proposed Action would be visible from a predominantly level and relatively narrow angle of view. The degree of change to the views from the Moapa Travel Center SVP would vary depending primarily on the time of day and visibility conditions. The landscape from this viewpoint would appear to be notably altered because of the dominance and contrast created by the proposed solar fields in terms of scale, color, line, texture, and form. The proposed addition of 77 wooden H-frame collector line poles in the BLM-managed designated utility corridor would not be visible from the Moapa Travel Center SVP.

#### ***Effects on Views from the I-15, Valley of Fire Road, and OSNHT SVPs***

From the I-15 SVP, the majority of the Proposed Action components would be visible in the foreground/midground and background by motorists. Approximately 93 percent (3,292 acres) of the Project components would be visible traveling in the northbound direction (**Photograph 3-6** and **Photograph 3-7**) and approximately 85 percent (2,995 acres) visible traveling in the southbound direction (**Photograph 3-8** and **Photograph 3-9**). Northbound motorists on I-15 would have views of the Proposed Action from the freeway for approximately 42 percent of the time (11.6 of the 27.4 miles) within the visual resource study area, or for approximately 9 minutes when driving at 75 miles per hour (mph). Traveling in the northbound direction, motorists would have intermittent head-on and peripheral views of the Proposed Action. Southbound motorists on I-15 would have views of the Proposed Action from the freeway for approximately 53 percent of the time (14.7 of the 27.4 miles) within the visual resource study area, or for approximately 12 minutes when driving at 75 mph. Traveling in the southbound direction, the head-on and peripheral views of the Proposed Action would be partially intermittent/obstructed due to intervening landforms. The proposed addition of 77 wooden H-frame collector line poles in the BLM-managed designated utility corridor would be intermittently visible from the I-15 SVP when travelling in the northbound and southbound directions, but would not be discernible due to the existing built features in the vicinity and the distances at which the proposed features would be viewed.



**Photograph 3-4. Existing View from the Moapa Travel Center (Looking West)**



**Photograph 3-5. Simulated Proposed View from the Moapa Travel Center (Looking West)**



**Photograph 3-6. Existing View from Interstate 15 Northbound (Looking North)**



**Photograph 3-7. Simulated Proposed View from Interstate 15 Northbound (Looking North)**



**Photograph 3-8. Existing View from Interstate 15 Southbound (Looking Southwest)**



**Photograph 3-9. Simulated Proposed View from Interstate 15 Southbound (Looking Southwest)**

From the Valley of Fire Road SVP, approximately 93 percent (3,292 acres) of the Proposed Action components would be visible in the foreground/middleground and background when travelling in the westbound direction (**Photograph 3-10** and **Photograph 3-11**). Westbound motorists on Valley of Fire Road would see the Proposed Action from the roadway for approximately 97 percent of the time (10.5 of the 10.8 miles) within the visual resource study area, or for 18 minutes when driving at 35 mph. Traveling in the westbound direction, the views of the Proposed Action would be continuous and viewed head-on. The Proposed Action would not be visible to eastbound motorists on Valley of Fire Road. The proposed addition of 77 wooden H-frame collector line poles in the BLM-managed designated utility corridor would be visible from the Valley of Fire Road SVP when travelling in the westbound direction, but would not be discernible due to the existing built features in the vicinity and the distances at which the proposed features would be viewed.

From the OSNHT SVP, approximately 99 percent (3,495 acres) of the Proposed Action would be visible in the foreground/middleground and background when travelling in the northbound direction (**Photograph 3-12** and **Photograph 3-13**). Northbound travelers on the OSNHT would have views of the Proposed Action for approximately 49 percent of the time (13.2 of the 27.1 miles) within the visual resource study area, or for approximately 4 hours when walking at 3 mph. Traveling in the northbound direction, the views of the Proposed Action would be partially obstructed due to intervening vegetation and landforms and would be viewed head-on and peripherally. Travelling in the southbound direction on the OSNHT SVP, approximately 88 percent (3,127 acres) of the Proposed Action would be visible in the foreground/middleground and background. Southbound travelers on the OSNHT would have views of the Proposed Action for approximately 32 percent of the time (8.6 of the 27.1 miles) within the visual resource study area, or for approximately 3 hours when walking at 3 mph. Traveling in the southbound direction, the head-on and peripheral views of the Proposed Action would be intermittent. The proposed addition of 77 wooden H-frame collector line poles in the BLM-managed designated utility corridor would be intermittently visible from the OSNHT SVP when travelling in the northbound and southbound directions, but would not be discernible due to the existing built features in the vicinity and the distances at which the proposed features would be viewed.

The potential impacts associated with the decommissioning process would be similar to the construction-related effects of the Proposed Action. The scenic quality and landscape character of the visual resource study area would be affected in the short-term by the generation of fugitive dust and movement of equipment and vehicles in and out of the visual resource study area. The decommissioning activities would introduce forms, lines, colors, and textures that would temporarily attract attention and notably contrast with the existing setting. In addition, the decommissioning activities would create a subtle degree of change in the characteristic landscape when viewed from the four SVPs (Moapa Travel Center, I-15, Valley of Fire Road, and the OSNHT).





**Photograph 3-10. Existing View from Valley of Fire Road (Looking Northwest)**



**Photograph 3-11. Simulated Proposed View from Valley of Fire Road (Looking Northwest)**



**Photograph 3-12. Existing View from the Old Spanish National Historic Trail (Looking Northwest)**



**Photograph 3-13. Simulated Proposed View from the Old Spanish National Historic Trail (Looking Northwest)**

### ***Glint and Glare***

Glint and glare<sup>5</sup> may occur when direct, normal sunlight reflects off a surface and someone is exposed to it. Although a visible light study has not been conducted for the Proposed Action, the following conclusions are based on a literature review of glint and glare studies for PV solar facilities and the Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States (BLM and DOE 2012). Glint and glare from PV solar panels would depend on the type of panels, rotation axis and tilt angle, screening elements, and other factors. The intensity of the glare produced by reflective surfaces varies depending on the type of surface. Solar panel surfaces reflect direct, normal irradiance in a manner similar to water.

Single-axis tracking PV solar panels would be installed and would be up to 20 feet above ground at their highest point, which would occur during the morning and evening hours when the trackers are tilted at their maximum angle. The panels rotate throughout the day to be oriented perpendicular to the sun to maximize solar absorption and energy output. The perpendicular orientation results in the majority of the incoming light being reflected back into the sky. Glare from solar panels, as with water, is most likely to occur after sunrise and before sunset and during the summer months. However, advancements in solar panels have increased the absorption of incident radiation. PV panel surfaces are designed specifically not to reflect light, thus reducing the potential for glint and glare (U.S. Air Force 2011). The solar panels may be designed with geometric textures or anti-reflection coatings to diffuse irradiance, thereby reducing the intensity of any reflection.

Construction equipment could result in some glare from glass windows or metallic parts but would not be a source of substantial or distracting glare. No substantial source of glint or glare would be introduced during construction of the Proposed Action. The type of equipment used during decommissioning is expected to be similar to that used during the construction period. Effects from glint and glare would be similar to those during construction and would be localized and not readily measurable.

The Proposed Action has the potential to result in glint and glare hazards. Motorists traveling along I-15, Valley of Fire Road, the OSNHT, and visitors at the Moapa Travel Center could experience an after-image from glint and glare caused by the solar panels. The potential for people at these locations to experience hazardous after-images from glint and glare is anticipated to be minor with anti-reflection coatings on the panels and because the experience would be intermittent or limited to certain times of the day. Viewers with views of the Proposed Action from above may be affected by glint and glare intermittently throughout the day, because larger portions of the solar arrays would be visible from an elevated position. In addition to viewer elevation, glint and glare experience is anticipated to decrease as distance between the proposed solar panels and the viewer increases. Studies indicate that luminance (light intensity) exponentially diminishes over distance (Sullivan et al. 2012).

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

### ***Summary of Direct and Indirect Effects of the Proposed Action***

There would be approximately 3,534 acres of impacted landscape under the Proposed Action that would reduce the overall scenic quality and modify the landscape character due to the cultural modifications introduced by the construction and decommissioning activities of the proposed solar facilities and ancillary components. Under the Proposed Action, the short-term magnitude of change to the characteristic landscape and scenic quality

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<sup>5</sup>Glint is a momentary flash of light produced as a direct reflection of the sun in the surface of an object. Glare is a more continuous and sustained presence of light that may appear to “sparkle.”

would range from a notable to substantial change depending on the type of construction and decommissioning activity taking place, visibility conditions, and time of day. During O&M, the landscape would appear to be substantially altered and would begin to dominate the visual setting of the visual resource study area. The change in landscape character and scenic quality associated with the O&M of the Proposed Action would attract attention due to the visual contrast in terms of form, color, and dominant scale of the Proposed Action in comparison to the predominantly flat landscape and low stature vegetation. The proposed solar facility would be visible and attract attention from I-15, Valley of Fire Road, the OSNHT, and the Moapa Travel Center SVPs depending on viewing distance, visibility conditions, direction of travel, and time of day. The Proposed Action would introduce elements not currently present within the visual resource study area, although these elements are found directly adjacent within the visual resource study area. Therefore, short-term, construction and decommissioning-related impacts would range from minor to moderate based on the viewing distance, type of activity taking place, and time of day. In the long-term, the Proposed Action would result in local, moderate, adverse impacts and minor, adverse impacts regionally to visual resources. The implementation of design features and BMPs (**Appendix B**) would minimize impacts to visual resources during construction, O&M, and decommissioning of the Proposed Action.

### 3.7.3 Proposed Action Conformance with BLM Visual Resource Management Objectives

The BLM has developed measurable standards for managing the visual resources of its administered lands through its Visual Resource Management (VRM) system (BLM 1984). In its planning process, the BLM weighs visual and competing resource values to allocate the VRM classes with associated management class objectives for a given area's visual setting. The VRM system assigns management classes ranging from VRM Class I to Class IV, where Class I has the objective to preserve the existing character of the landscape and Class IV allows for major modifications of the existing character of the landscape. The BLM-managed lands, including the designated utility corridor, associated with the Proposed Action are designated as VRM Class IV. The objective of VRM Class IV is to provide for management activities that require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repetition of the basic elements.

Based on the visual resource analysis conducted for this project, the magnitude of impact determined whether or not the Proposed Action would be in conformance with the established VRM objectives for lands administered by the BLM. The Proposed Action would have no impact on the BLM lands associated with the gentle line and existing access roads and no new ground disturbance would occur. The proposed overhead and/or underground collector lines, which would cross the BLM-managed designated utility corridor, would include up to 20 acres of ground disturbance (13 acres for SBSP I and 7 acres for SBSP II) and would mimic elements that are already present in the visual resource analysis area, with the addition of up to 57 wooden H-frame collector line poles for SBSP I and 20 wooden H-frame collector line poles for SBSP II. These visual impacts would create weak contrast with the existing landscape character and would not attract attention from the casual observer when viewed from the I-15, Valley of Fire Road, OSNHT, and Moapa Travel Center SVPs. Therefore, the Proposed Action would be in conformance with the VRM Class IV objectives for all lands administered by the BLM.

### ADDITIONAL MEASURES TO AVOID AND/OR MINIMIZE IMPACTS

With the implementation of the BMPs and other design features in **Appendix B**, no additional measures to minimize impacts are recommended.

## DIRECT AND INDIRECT EFFECTS OF THE NO ACTION ALTERNATIVE

Under the No Action Alternative, the SBSPs would not be built. Therefore, no new disturbance to the characteristic landscape would occur, no new elements or patterns would be introduced to the visual resource study area, and there would be no impact on the casual observer from any stationary or linear SVPs.

### 3.8 Cumulative Effects

The determination of what past, present, and reasonably foreseeable future actions to consider in the impact analysis is based on the resources being affected by the proposed SBSPs. Past, present, and reasonably foreseeable future actions that incrementally add to the potential cumulative impacts of the Proposed Action, and No Action Alternative are considered in this EIS. The intent of this analysis is to capture the total effects of multiple actions over time that would be missed by evaluating each action individually.

#### 3.8.1 Cumulative Effects Analysis Area and Timeframe of Effects

Each resource being analyzed has a defined cumulative effects analysis area (CEAA) for the Proposed Action and No Action Alternative. **Table 3-11** provides the geographic area of the CEAs by resource. **Figure 3-6** and **Figure 3-7** show the boundaries of each of the CEAs.

**Table 3-11. Cumulative Effects Analysis Areas (CEAs)**

Resource	CEAA <sup>1</sup> and Rationale for CEAA	Size of CEAA (Acres)
Cultural Resources	5 miles. The area for which project components may be visible from cultural resource sites or important elements of the resources, such as TCPs and historic trails, roads, buildings, and structures.	112,161
Invasive Plant Species and Noxious Weeds	Dry Lake Valley (HUC 1501001206) and California Wash (HUC 1501001207) watersheds. Direct effects from invasive plant species and noxious weeds would be limited to the Project area. Changes in ground and surface water quantity and quality that may indirectly affect spread of weeds would be limited to the watersheds the Projects fall within.	334,479
Moapa Dace	LWFRS hydrologic basin. Area in which groundwater withdrawals have the potential to impact habitat for the Moapa Dace, as determined by the State Engineer (Wilson 2020).	1,011,833
Mojave Desert Tortoise	Northeastern Mojave Recovery Unit for Mojave desert tortoise. Geographic range of local Mojave desert tortoise population.	5,116,797
Socioeconomics	Clark County. Area in which the majority of Project-related expenditures, tax revenues, and employment would occur.	5,157,369
Soils	Dry Lake Valley (HUC 1501001206) and California Wash (HUC 1501001207) watersheds. Effects to soils are closely related to surface and stormwater flows, and therefore, are limited to the watersheds the Projects fall within.	334,479
Transportation	Clark County. Area in which the majority of Project-related traffic would occur.	5,157,369
Vegetation	Dry Lake Valley (HUC 1501001206) and California Wash (HUC 1501001207) watersheds. Direct effects to vegetation would be limited to the Project area. Changes in ground and surface water quantity and quality that may indirectly affect vegetation would be limited to the watersheds the Projects fall within.	334,479

Resource	CEAA <sup>1</sup> and Rationale for CEAA	Size of CEAA (Acres)
Visual Resources	10 miles. Due to the scale and visibility of the Projects, facilities beyond this distance might sometimes be noticed by casual observers but would appear to be so small as to have negligible impacts.	315,975
Water Resources	Dry Lake Valley (HUC 1501001206) and California Wash (HUC 1501001207) watersheds. Direct and indirect effects to water resources would be limited to the watersheds the Projects fall within.	334,479

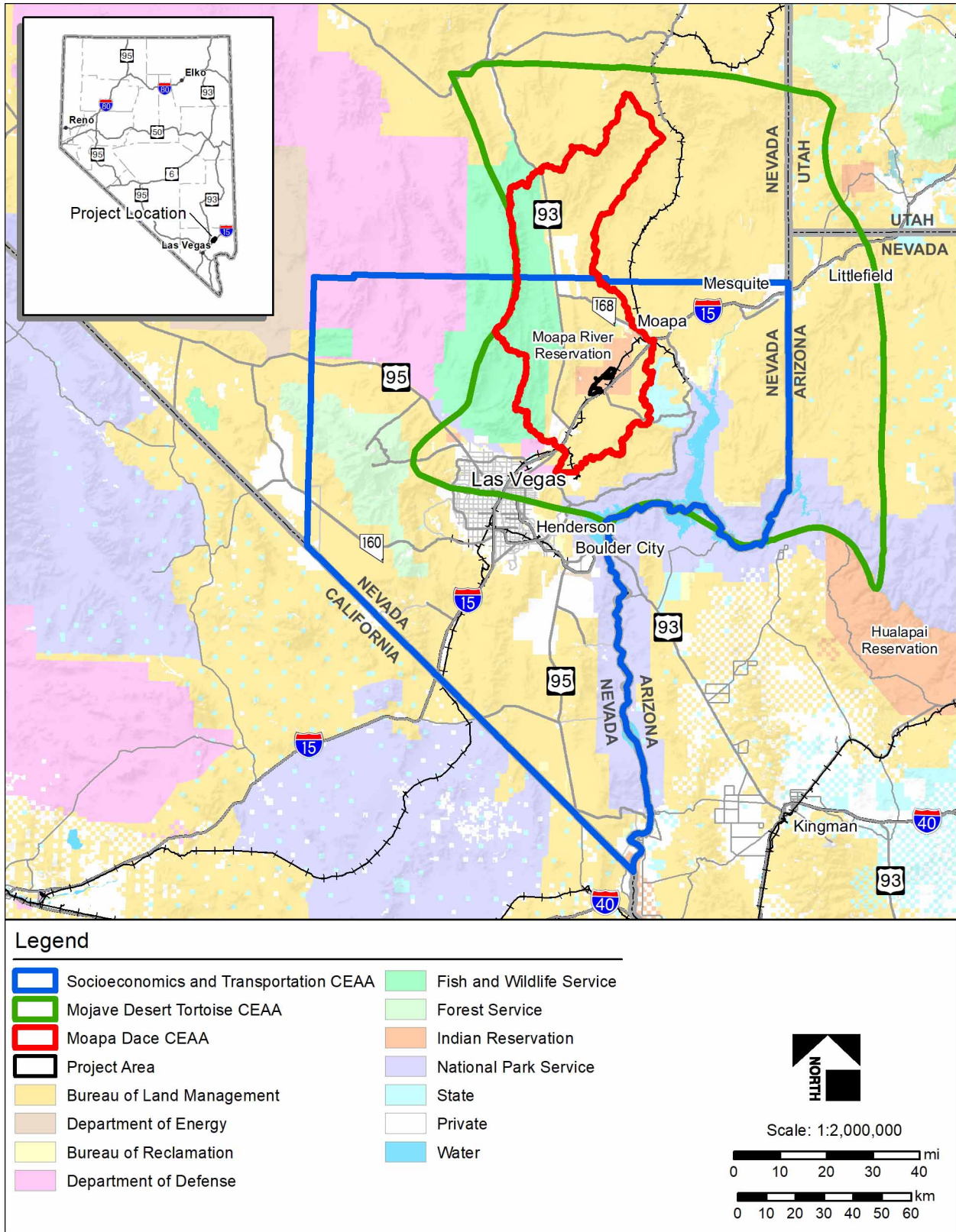
<sup>1</sup> Where miles are used, miles refer to the distance from the Project area boundary.

*Table Abbreviations:* HUC = Hydrologic Unit Code; LWRFS = Lower White River Flow System

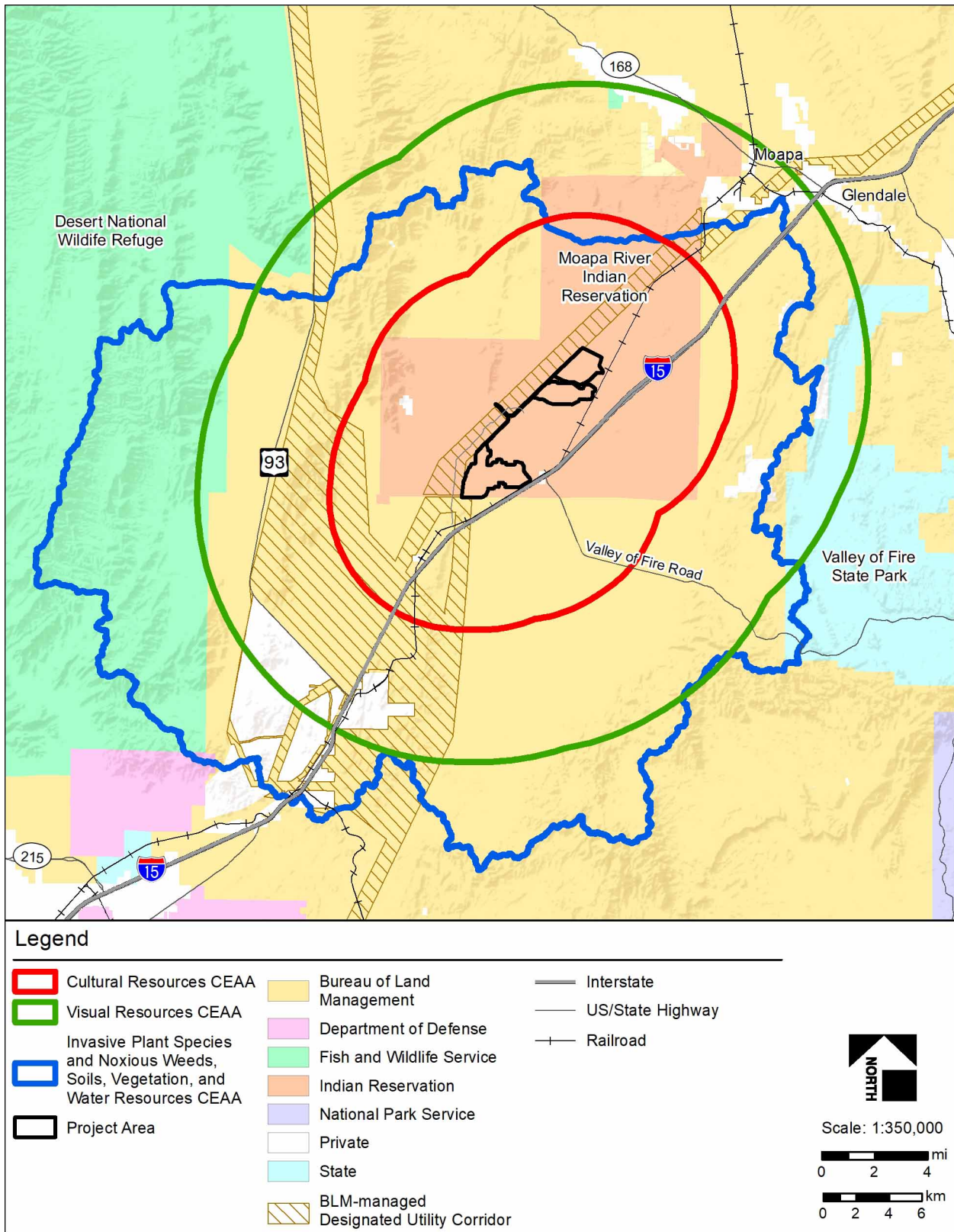
In terms of timeframe, the cumulative effects analysis is considered over a 50-year period. Fifty years would include the expected operational period for the solar facilities, as well as the time required to construct and decommission the Projects.

### 3.8.2 Past and Present Actions

The cumulative effects analysis does not attempt to quantify the effects of past human actions by adding up all prior actions on an action-by-action basis. Existing conditions reflect the aggregate impact of prior human actions and natural events that have affected the environment and could contribute to cumulative effects. By looking at current conditions, the residual effects of past human actions and natural events are captured, regardless of which particular action or event contributed those effects. The CEQ issued an interpretive memorandum on June 24, 2005 regarding analysis of past actions, which states, “agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions.”



**Figure 3-6. Moapa Dace, Mojave Desert Tortoise, Socioeconomics, and Transportation CEAs**



**Figure 3-7. Cultural Resources, Invasive Plant Species and Noxious Weeds, Soils, Vegetation, Visual Resources, and Water Resources CEAs**



### 3.8.3 Reasonably Foreseeable Future Actions

Reasonably foreseeable future actions are actions that have existing decisions, funding, or formal proposals or that are highly probable. These actions are not connected to the Proposed Action or No Action Alternative. They are projections being made so that future effects, cumulative and otherwise, can be estimated, as required by NEPA. Specific projects within the resource CEAs were identified by reviewing available information from numerous agencies, including the BLM, Clark County, Department of Defense, NDOT, Nevada Public Utilities Commission, Nevada State Parks, USDA Forest Service, and USFWS. **Table 3-12** provides a brief description of the identified reasonably foreseeable future actions and indicates which CEAs the project falls within.

**Table 3-12. Reasonably Foreseeable Future Actions**

Project Name	Project Summary	Relevant Resources
Aiya Solar	Planned 100 MW PV solar facility on approximately 900 acres of Reservation land approximately 8.5 miles northeast of the SBSPs. The ROD was issued in 2016, but the project does not currently have a power purchaser and the construction timeline is unknown.	Invasive Plant Species and Noxious Weeds, Moapa Dace, Mojave Desert Tortoise, Socioeconomics, Soils, Transportation, Vegetation, Visual Resources, Water Resources
Arida-Mohave Transmission Line and Solar Project	Proposed 7-mile, 500 kV transmission line connecting the proposed Arida Solar Project to the existing Mohave Substation near Laughlin, NV. Up to 9,000 acres of land would be required for the solar facility. Construction timeline is unknown.	Socioeconomics, Transportation
Arrow Canyon Solar Project	Proposed 200 MW PV solar facility, BESS, and associated gen-tie line on approximately 2,200 acres of Reservation and BLM lands less than 1 mile west of the SBSPs. The project would be constructed over 20 months starting third quarter of 2021.	Cultural Resources, Invasive Plant Species and Noxious Weeds, Moapa Dace, Mojave Desert Tortoise, Socioeconomics, Soils, Transportation, Vegetation, Visual Resources, Water Resources
Battle Born Solar	Proposed 850 MW PV solar facility, BESS, and associated gen-tie line on approximately 9,416 acres of BLM lands approximately 12.5 miles east of the SBSPs. Construction would take 24 months and is anticipated to be completed in 2024.	Socioeconomics, Desert Tortoise, Transportation
Boulder Solar III	Planned 128 MW PV solar facility, 58 MW BESS, and associated gen-tie line located on private land in Boulder City, NV approximately 50 miles south of the SBSPs. Size of the facility is unknown at this time. Construction is planned for 2023.	Socioeconomics, Transportation
Chuckwalla Solar	Proposed 250 MW PV solar facility, BESS, and associated gen-tie line on approximately 2,200 acres of Reservation and BLM lands less than 1 mile west of the SBSPs. Construction scheduled to begin in second quarter of 2022.	Cultural Resources, Invasive Plant Species and Noxious Weeds, Moapa Dace, Mojave Desert Tortoise, Socioeconomics, Soils, Transportation, Vegetation, Visual Resources, Water Resources

<b>Project Name</b>	<b>Project Summary</b>	<b>Relevant Resources</b>
Dry Lake East Designated Leasing Area	Proposed Designated Leasing Area (DLA) for development of utility-scale solar energy generation and transmission facilities on 1,813 acres of BLM land approximately 4 miles southwest of the SBSPs. Applicants would need to conduct separate NEPA analysis for solar developments within the DLA.	Cultural Resources, Invasive Plant Species and Noxious Weeds, Moapa Dace, Mojave Desert Tortoise, Socioeconomics, Soils, Transportation, Vegetation, Visual Resources, Water Resources
Dry Lake Solar Energy at Harry Allen	Planned 20 MW PV solar facility and BESS on 155 acres of BLM land approximately 5 miles south of the SBSPs. Construction timeline is unknown.	Cultural Resources, Invasive Plant Species and Noxious Weeds, Moapa Dace, Mojave Desert Tortoise, Socioeconomics, Soils, Transportation, Vegetation, Visual Resources, Water Resources
Dry Lake Solar Energy Center	Planned 150 MW PV solar facility and associated gen-tie line on 694 acres of BLM land in the Dry Lake Solar Energy Zone, approximately 5 miles southwest of the SBSPs. Construction timeline is unknown.	Cultural Resources, Invasive Plant Species and Noxious Weeds, Moapa Dace, Mojave Desert Tortoise, Socioeconomics, Soils, Transportation, Vegetation, Visual Resources, Water Resources
Eagle Shadow Mountain Solar	Planned 300 MW PV solar facility, BESS, and associated gen-tie line on 2,616 acres of Reservation, BLM, and private lands less than 1 mile west of the SBSPs. Construction anticipated between 2020 and 2021.	Cultural Resources, Invasive Plant Species and Noxious Weeds, Moapa Dace, Mojave Desert Tortoise, Socioeconomics, Soils, Transportation, Vegetation, Visual Resources, Water Resources
Eastern Nevada Transmission Project	Construction of two 230 kV overhead transmission lines on BLM, Bureau of Reclamation, and private lands approximately 10 miles northeast of the SBSPs. The Gemmill to Tortoise line will be 21 miles long and the Silverhawk to Newport line will be 33 miles long. Construction is anticipated to take 24 months, but timeline is unknown.	Moapa Dace, Mojave Desert Tortoise, Socioeconomics, Transportation
Gemini Solar	Planned 690 MW PV solar facility, BESS, and associated gen-tie lines on 7,100 acres of BLM land less than 1 mile south of the SBSPs. Construction planned from late 2020 through December 2023.	Cultural Resources, Invasive Plant Species and Noxious Weeds, Moapa Dace, Mojave Desert Tortoise, Socioeconomics, Soils, Transportation, Vegetation, Visual Resources, Water Resources

<b>Project Name</b>	<b>Project Summary</b>	<b>Relevant Resources</b>
Greenlink West Transmission Line	Proposed 350-mile, 525 kV transmission line running from the Harry Allen Substation, along the western border of Nevada, to the Fort Churchill Substation in Reno. Numerous land jurisdictions are involved. Construction is anticipated to be completed in 2029.	Invasive Plant Species and Noxious Weeds, Moapa Dace, Mojave Desert Tortoise, Socioeconomics, Soils, Transportation, Vegetation, Visual Resources, Water Resources
Harry Allen Solar	Planned 130 MW PV solar facility and associated gen-tie line on 725 acres of BLM land within the Dry Lake Solar Energy Zone approximately 5 miles southwest of the SBSPs. Construction is anticipated to take 18 months, but timeline is unknown.	Cultural Resources, Invasive Plant Species and Noxious Weeds, Moapa Dace, Mojave Desert Tortoise, Socioeconomics, Soils, Transportation, Vegetation, Visual Resources, Water Resources
I-15 Tropicana Interchange	NDOT-planned improvements to the highway interchange at I-15 and Tropicana in Las Vegas approximately 32 miles southwest of the SBSPs. Construction from 2022 through 2024.	Mojave Desert Tortoise, Socioeconomics, Transportation
I-515 Charleston Blvd. Interchange	NDOT-planned improvements to the highway interchange at I-515 and Charleston Blvd. in Las Vegas approximately 28 miles southwest of the SBSPs. Construction from 2022 through 2023.	Mojave Desert Tortoise, Socioeconomics, Transportation
Mojave Desert Burned Area Restoration of Desert Tortoise Habitat	Aerial herbicide and reseeding treatments on 1,176.5 acres of BLM land in multiple burned areas across southern Nevada to restore habitat for Mojave desert tortoise. Closest treatment area is approximately 7 miles west of the SBSPs. Treatments were scheduled for 2016–2020 with monitoring through 2022.	Invasive Plant Species and Noxious Weeds, Moapa Dace, Mojave Desert Tortoise, Socioeconomics, Soils, Transportation, Vegetation, Visual Resources, Water Resources
Nevada Test and Training Range (NTRR) Land Withdrawal	Proposed legislation to renew and expand the withdrawal of public lands for military use to support the NTRR by enhancing range capacity for training and testing. The withdrawal would include up to 227,000 acres. The new boundary of the NTRR would be as little as 25 miles west of the SBSPs. Congress will most likely vote on the legislation during 2021.	Moapa Dace, Mojave Desert Tortoise, Socioeconomics, Transportation
Playa del Sol Solar	Proposed 120 MW PV solar facility and associated gen-tie line on 1,180 acres of BLM land less than 1 mile southwest of the SBSPs. Construction timeline is unknown.	Cultural Resources, Invasive Plant Species and Noxious Weeds, Moapa Dace, Mojave Desert Tortoise, Socioeconomics, Soils, Transportation, Vegetation, Visual Resources, Water Resources
Red Flats Solar	Proposed 500 MW PV solar facility on 4,000 acres of BLM land approximately 5 miles northeast of the SBSPs. Construction timeline is unknown.	Cultural Resources, Moapa Dace, Mojave Desert Tortoise, Socioeconomics, Soils, Transportation, Visual Resources

<b>Project Name</b>	<b>Project Summary</b>	<b>Relevant Resources</b>
Red Valley Solar	Proposed 200 MW PV solar facility on 2,000 acres of BLM land approximately 9 miles north of the SBSPs. Construction timeline is unknown.	Mojave Desert Tortoise, Socioeconomics, Soils, Transportation, Visual Resources
Rough Hat Solar	Proposed 400 MW PV solar facility and associated gen-tie line on 2,400 acres of BLM land approximately 64 miles southwest of the SBSPs. Construction timeline is unknown.	Socioeconomics, Transportation
Targeted and Prescribed Grazing of Annual Grasses in Great Basin Ecoregions of Nevada	Implementation of targeted and prescribed grazing to control invasive annual grasses and reduce risk of future catastrophic fires on more than 24 million acres of public lands throughout Nevada. Treatments to begin in 2021.	Moapa Dace, Mojave Desert Tortoise
Tavaci Solar (previously Valley of Fire Solar)	Proposed 250 MW PV solar facility, BESS, and associated gen-tie line on 2,200 acres of Reservation and BLM lands approximately 2 miles east of the SBSPs. Construction anticipated to be completed in 2023.	Cultural Resources, Invasive Plant Species and Noxious Weeds, Moapa Dace, Mojave Desert Tortoise, Socioeconomics, Soils, Transportation, Vegetation, Visual Resources, Water Resources
Townsite Solar	Planned 180 MW PV solar facility, BESS, and associated gen-tie line on 948 acres of City of Boulder City, BLM, and Western Area Power Administration lands approximately 50 miles south of the SBSPs. Construction planned for 2021.	Socioeconomics, Transportation
TransWest Express Transmission Project	Approximately 725 miles of 600 kV transmission lines in Colorado, Nevada, Utah, and Wyoming. A portion of the transmission lines would be constructed within the BLM-managed designated utility corridor on the Reservation. Additionally, a 160-acre ground electrode facility will be constructed near Moapa, NV. Construction from 2021 through 2024.	Cultural Resources, Invasive Plant Species and Noxious Weeds, Moapa Dace, Mojave Desert Tortoise, Socioeconomics, Soils, Transportation, Vegetation, Visual Resources, Water Resources
Tule Desert, Meadow Valley, Kane Springs Fuel Breaks	Construction of 299 miles of fuel breaks on 2,484 acres of BLM land through treatment of invasive annual grasses. Project includes up to 50 acres of native seeding and is designed to protect Mojave desert tortoise habitat. Nearest treatment units are approximately 28 miles northeast of the SBSPs. Treatments to begin in 2021.	Moapa Dace, Mojave Desert Tortoise
Uplands Herbicide Use, BLM Las Vegas Field Office	Herbicide treatment of non-native and invasive weed species in upland (non-riparian) areas throughout BLM lands within the Las Vegas Field Office. Includes backpack, horseback, utility terrain vehicle, truck, and aerial herbicide applications. Treatments began in 2020.	Cultural Resources, Invasive Plant Species and Noxious Weeds, Moapa Dace, Mojave Desert Tortoise, Socioeconomics, Soils, Transportation, Vegetation, Visual Resources, Water Resources

Project Name	Project Summary	Relevant Resources
Yellow-Pine Solar	Planned 500 MW PV solar facility, BESS, and associated gen-tie line on 3,085 acres of BLM land approximately 60 miles southwest of the SBSPs. Construction scheduled for 2022.	Socioeconomics, Transportation

Other reasonably foreseeable future actions and management activities occurring in the CEAs that are highly probable include livestock grazing, range improvements, vegetation management, recreation (e.g., hunting, off-highway recreational use), road improvements, transmission lines, telephone lines, communication towers, solar and wind development, and community development. Other disturbances that are ongoing include wildland fire and the spread and establishment of invasive plant species and noxious weeds.

### 3.8.4 Cumulative Impacts to Resources

For this analysis, cumulative resource impacts for the CEAs are the combined direct and indirect effects of the present and reasonably foreseeable future actions, in addition to the direct and indirect impacts of the Proposed Action and No Action Alternative. The levels of cumulative impacts are categorized as major, moderate, or minor based on the same thresholds defined in Section 3.1. If the results of the analysis of direct or indirect impacts were considered to be none or negligible as a result of the Proposed Action or No Action Alternative, there would be no measurable contribution to a cumulative effect; therefore, no cumulative effects analysis for the respective resource/use has been done.

Based on the analysis of direct and indirect impacts provided in Section 3.1, neither the Proposed Action nor No Action Alternative would have long-term, minor, moderate, or major direct or indirect effects to air quality; ACECs; BLM-Sensitive Species and Nevada State Listed Species; climate change; environmental justice; farmlands; fire management; floodplains/flood hazards; forest resources; general wildlife; hunting, fishing, and gathering; Indian Trust Assets; invasive plant species and noxious weeds, lands and realty; lands with wilderness characteristics; lifestyle and cultural values; livestock grazing; migratory birds; minerals; Native American religious concerns; noise; paleontological resources; public health and safety; recreation; timber harvesting; topography and geology; wastes (hazardous and solid); wetlands/riparian zones; Wild and Scenic Rivers; wilderness and wilderness study areas; and wild horses and burros within the Project area. There would be no measurable contribution to the resource's/use's respective cumulative impacts; therefore, there is no cumulative effects analysis for these resources/uses. Refer to **Table 3-1** for detailed information on these resource/uses.

At the end of the description of the cumulative impacts for each resource below, concluding statements of impacts are provided. The alternative's magnitude, duration, and intensity of direct and indirect impacts are restated, followed by a similar summary of total cumulative impacts that includes consideration of the alternative's direct and indirect effects. A statement of the contribution of the alternatives' impacts to the cumulative impacts is made as well.

## CULTURAL RESOURCES

The types of projects or actions within the CEAA for cultural resources (defined as a five-mile buffer from the Project area) includes multiple solar facility construction projects, transmission power line construction projects, and vegetation management projects. In general, the loss of several resources from a particular tribe or representing a particular time period could result in significant impacts with respect to the information those resources possess. Other projects in the region could affect resources with similar information about a particular tribe or timeframe, resulting in a cumulative effect. Several cumulative projects in the area could or did directly and indirectly affect cultural resources. Impacts on cultural resources from other projects in the analysis area

result largely from the additional solar development and transmission line construction projects. The indirect visual effects of these project would result in long-term adverse effects where disturbed areas within the viewshed are not reclaimed or rehabilitated, resulting in substantial adverse cumulative impacts in the region. Additionally, cumulative projects could directly affect previously unknown cultural resources during construction, and the cumulative effect from the loss of these resources could be substantial.

#### ***Proposed Action Contribution to Cumulative Impacts***

There will be no direct effects to cultural resources as a result of the construction, O&M, or decommissioning of the SBSPs, since no eligible cultural resource sites are present in the Project footprint. The Proposed Action would result in a localized, long-term adverse effect in the indirect APE following construction. An MOA was prepared (**Appendix O**) to lessen, resolve, and/or mitigate the adverse effects.

Other projects under BLM, BIA, or other federal jurisdiction would be subject to the same Section 106 requirements, requiring similar mitigation and impact minimization as the SBSPs. Cumulatively, effects of the Proposed Action, when combined with past, present, and reasonably foreseeable future actions, would result in substantial cumulative impacts. The Proposed Action's contribution to the substantial cumulative effects on cultural resources would be negligible because adverse effects would be minimized through implementation of the MOA.

#### ***No Action Alternative Contribution to Cumulative Impacts***

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

### **INVASIVE PLANT SPECIES AND NOXIOUS WEEDS**

The types of projects or actions that could contribute to impacts from invasive plant species and noxious weeds include transmission lines, wind and solar development, vegetation management, off-highway recreation, agricultural uses, construction projects, and community development. Other disturbances that are ongoing and may affect introduction and spread of invasive plant species and noxious weeds include wildland fire and vehicle travel on highways and established gravel and dirt roads. Ground-disturbance associated with many of these actions could lead to removal of native vegetation which encourages weed germination and establishment. Erosion and stormwater runoff also can aide in weed germination and establishment, but for most projects this would be minimized through the implementation of SWPPPs. Chemicals used in agriculture and vegetation management could also impact native vegetation and increase the introduction and spread of weeds. Invasive plant species and noxious weeds have the potential to affect soils by displacing native vegetation and depleting soil nutrients; impact native vegetation by outcompeting for nutrients, space, and water and reducing overall plant diversity; contribute to the decline of special status plant species; degrade wildlife habitat; and lead to an increase in the frequency and intensity of wildland fires.

The BLM, which manages approximately 62 percent of lands within the CEAA, has a number of ongoing and planned vegetation management projects (see **Table 3-12**) that are designed to treat invasive plant species and noxious weeds and restore native vegetation communities. The BLM also includes conservation measures in grazing lease renewals that are designed to minimize the introduction and spread of invasive plant species and noxious weeds, promote native vegetation communities, and reduce soil erosion and compaction. These projects would have long-term beneficial impacts in controlling invasive plant species and noxious weeds within the CEAA. On the other hand, the large number of solar facilities and transmission lines proposed or planned within the CEAA would disturb thousands of acres within the CEAA (see **Table 3-12**) and would contribute to the

introduction and spread of invasive plant species and noxious weeds. Site restoration and rehabilitation and implementation of Integrated Weed Management Plans and Fire Management Plans associated with these projects would minimize the potential effects and may lead to long-term benefits from improved weed control and reduced risk of catastrophic wildfires.

In combination, past, present, and reasonably foreseeable future actions would result in moderate, long-term, adverse and beneficial impacts related to invasive plant species and noxious weeds within the CEAA because these projects would contribute to the introduction and spread of invasive plant species in some areas while the current status of weeds in other areas would decrease due to weed management practices.

#### ***Proposed Action Contribution to Cumulative Impacts***

With the implementation of design features and BMPs (**Appendix B**) and the Integrated Weed Management Plan (**Appendix E**) to prevent or address potential increases in introduction and spread of invasive plant species and noxious weeds, impacts would be minimized. The Proposed Action would result in minor, short-term, direct and indirect, adverse impacts associated with the introduction and spread of invasive plant species and noxious weeds during construction, and negligible long-term, direct and indirect, adverse impacts during O&M and decommissioning.

Cumulatively, effects of the Proposed Action, when combined with past, present, and reasonably foreseeable future actions, would result in moderate, long-term, adverse and beneficial impacts related to invasive plant species and noxious weeds within the CEAA. The Proposed Action would have a minor contribution to the cumulative effects due to the relatively small area of the Project area that would be permanently disturbed from construction of the SBSPs and implementation of the design features and BMPs (**Appendix B**) and the Integrated Weed Management Plan (**Appendix E**). Impacts created by the solar facilities would be largely reversible with decommissioning of the Proposed Action at the end of its useful life and restoration of the landscape.

#### ***No Action Alternative Contribution to Cumulative Impacts***

There would be no contribution to cumulative impacts related to invasive plant species and noxious weeds because the No Action Alternative would not result in any impacts. As such, the No Action Alternative is not analyzed for cumulative impacts related to invasive plant species and noxious weeds.

### **SOCIOECONOMICS**

The types of projects or actions that could contribute to impacts to socioeconomics include infrastructure (road improvements, transmission/utility lines, communication towers, wind and solar projects, etc.) and community development. Other ongoing disturbances that may affect socioeconomics include wildland fire. There are five additional proposed utility solar scale solar projects within the Reservation, two of which have already been approved but not yet constructed (see **Table 3-12**). The previously constructed Southern Paiute Solar Project is also located on the Reservation. Together, these solar projects will generate a significant amount of lease revenue for the Moapa Band. Construction of the approved and proposed solar facilities will generate additional revenue from the purchase of goods and services from within the Reservation. These projects will also employ tribal members, which will reduce unemployment and increase earnings on the Reservation. These economic contributions will have a major beneficial effect on socioeconomics within the Reservation.

These projects will also employ other workers within Clark County, and additional goods and services will be purchased from within the County. Payroll and sales taxes generated from this employment and purchase of materials will generate additional revenue for the County and State. There are 13 additional solar projects proposed in Clark County outside the Reservation (see **Table 3-12**), and an additional 1,813 acres of land set

aside for future solar development in the Dry Lake East Designated Leasing Area, that will also contribute to the regional economy. To distribute this energy throughout the region, NV Energy and other utilities are proposing to construct hundreds of miles of transmission lines throughout Nevada and neighboring states (see **Table 3-12**). Transmission line construction within Clark County will generate additional short-term revenues and tax income along with long-term income from ROW leases. Construction of several major road improvements in and around the Las Vegas metropolitan area will have a similar contribution to the regional economy (see **Table 3-12**). The Las Vegas metropolitan area has been one of the fastest growing regions in the country over the past several decades, and this growth is projected to continue into the future (University of Nevada Las Vegas [UNLV] 2017, 2020). A substantial amount of community development, including residential and commercial construction along with expansion of public facilities and services, will be necessary to accommodate this growth. While this will also contribute to increasing employment, income, and public revenues within the region, it will place increasing demands on public facilities and services and will require increased spending by State and local governments to meet the needs of the growing population.

Given the large number of projects currently proposed within the CEAA for socioeconomics, and the likelihood that additional projects will be proposed and constructed over the 50-year timeframe of the analysis, there will be an increased demand for construction workers and other skilled jobs in the renewable energy sector. These additional employment opportunities are important factor driving population growth in Clark County (UNLV 2017). As people continue to migrate to Clark County, there could be noticeable shifts in population, demographics, and housing characteristics. Recent trends in the racial composition of growing communities in Clark County, such as the City of Henderson, indicate a shift toward more diverse populations (Healy 2020).

Developers are already struggling to meet the increased demand for housing due to a lack of skilled construction workers in the local labor pool, rising construction costs, and lack of land available for development (Healy 2020). While the diversification of the economy in Clark County, represented by a shift from leisure and hospitality jobs towards higher-paying jobs in the tech and manufacturing sectors, will increase the median income within the County, most of these positions are being filled by workers migrating to the County from other states. As a result, median home prices have increased from approximately \$200,000 to \$305,000 since the end of the Great Recession. Rents across Nevada have increased by 15 percent since 2016, more than twice the national average, and more than 48 percent of renters in the state are considered cost-burdened, meaning they spend more than 30 percent of their income on housing (Healy 2020; Sisson 2019). Without significant local government investment in affordable housing, it is possible that lower income residents in Clark County could be displaced.

In combination, past, present, and reasonably foreseeable future actions would result in moderate to major, long-term, beneficial impacts on socioeconomics that, overall, would increase income and employment within the Reservation and Clark County as a whole.

#### ***Proposed Action Contribution to Cumulative Impacts***

The Proposed Action would have short- and long-term, direct and indirect, beneficial impacts on socioeconomics from the increase in employment, income, expenditures, and tribal and public revenues. Effects would be greatest during the construction and decommissioning phases due to the size of the workforce required. Although long-term benefits to employment and income would be less during O&M, the lease revenue generated by the Projects would have a long-term, beneficial effect on tribal revenue. The beneficial effects to socioeconomics on the Reservation would be major, while the beneficial effects on the regional economy would be minor.



Cumulatively, effects of the Proposed Action, when combined with past, present, and reasonably foreseeable future actions, would result in moderate, short- and long-term, beneficial effects on socioeconomics within the CEAA. The Proposed Action would have a moderate local contribution to cumulative effects on socioeconomics within the Reservation and a minor regional contribution to cumulative effects on socioeconomics.

***No Action Alternative Contribution to Cumulative Impacts***

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

**SOILS**

The types of projects or actions that could contribute to impacts to soils include transmission lines, wind and solar development, vegetation management, off-highway recreation, agricultural uses, and community development. Other disturbances that are ongoing and may affect soils include wildland fire and the spread and establishment of noxious weeds and invasive plant species. Ground-disturbance associated with many of these actions could lead to increased soil erosion and stormwater runoff that could reduce soil productivity. Erosion and stormwater runoff from most projects would be minimized through the implementation of SWPPPs. Chemicals used in agriculture and vegetation management could contaminate soils. Accidental spills and leaks of potentially hazardous materials associated with some of the projects could also contaminate soils if not properly contained. The spread of noxious and invasive weeds also has the potential to affect soils by displacing native vegetation and depleting soil nutrients. The spread of noxious and invasive weeds can also increase the frequency and severity of wildland fires. Large fires remove vegetative cover important for stabilizing soils and intercepting precipitation, which can lead to substantial increases in soil erosion and decreased soil productivity.

The BLM, which manages approximately 62 percent of lands within the CEAA, has a number of ongoing and planned vegetation management projects (see **Table 3-12**) that may directly and indirectly affect soils within the CEAA. These projects are designed to restore native vegetation communities, which may help stabilize soils. The BLM also includes conservation measures in grazing lease renewals that are designed to minimize the introduction and spread of invasive plant species and noxious weeds, promote native vegetation communities, and reduce soil erosion and compaction. These projects would have long-term beneficial impacts to soils within the CEAA. On the other hand, the large number of solar facilities and transmission lines proposed or planned within the CEAA for soils would disturb thousands of acres of soils within the CEAA (see **Table 3-12**). Site restoration and rehabilitation and implementation of Integrated Weed Management Plans and Fire Management Plans associated with these projects would minimize the potential effects to soils and may lead to long-term benefits from improved weed control and reduced risk of catastrophic wildfires.

In combination, past, present, and reasonably foreseeable future actions would result in moderate, long-term, adverse and beneficial impacts on soils within the CEAA because erosion and loss of soil productivity would increase in some areas while decreasing in others.

***Proposed Action Contribution to Cumulative Impacts***

With the implementation of design features and BMPs (**Appendix B**) to prevent or address potential increases in soil erosion and sedimentation, including physical soil stabilization and revegetation as outlined in applicable plans (e.g., Site Restoration Plan, SWPPP, and drainage plan), impacts to soils would be minimized. Therefore, the Proposed Action would have minor, localized, short- and long-term, adverse effects on soils.

Cumulatively, effects of the Proposed Action, when combined with past, present, and reasonably foreseeable future actions, would result in moderate, long-term, adverse and beneficial effects on soils within the CEAA. The Proposed Action would have a minor contribution to the cumulative effects to soils due to the relatively small area of soils that would be permanently disturbed from construction of the SBSPs and the design features and BMPs (**Appendix B**) that would be implemented to minimize impacts to soils. Soil impacts created by the solar facilities would be largely reversible with decommissioning of the Proposed Action at the end of its useful life and restoration of the landscape.

#### ***No Action Alternative Contribution to Cumulative Impacts***

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

### **THREATENED AND ENDANGERED SPECIES**

#### ***Mojave Desert Tortoise***

The types of projects or actions that could contribute to impacts to desert tortoise include transmission lines, communication towers, livestock grazing, wind and solar development, vegetation management, off-highway recreation, agricultural uses, and community development. Of the more than 5 million acres within the Northeastern Mojave Recovery Unit for Mojave desert tortoise, 4,766 acres have been developed as part of previously approved and constructed solar projects. Approximately 34,500 acres of solar projects are currently proposed for future construction within the Northeastern Mojave Recovery Unit, which could affect desert tortoise habitat. The combined past, present, and future solar projects make up 0.77 percent of the recovery unit. Conflicts with energy development projects, including solar and wind development, are recognized by USFWS as a major threat to desert tortoise (USFWS 2014d). Other projects in the CEAA that may affect desert tortoise include transmission line construction, highway improvement projects, desert tortoise habitat restoration, expansion of the Nevada Test and Training Range, herbicide and targeted grazing treatments of invasive plant species and noxious weeds, and fuel break treatments within the Tule Desert, Meadow Valley, and Kane Springs (**Table 3-12**). The acres of suitable desert tortoise habitat that may be impacted due to these future actions are unknown at this time.

Some of the reasonably foreseeable future actions would result in beneficial impacts to desert tortoise. These include treatments to remove and minimize the spread of invasive plant species and noxious weeds, desert tortoise habitat restoration, and fuel treatments and firebreaks. Invasive plant species and noxious weeds, which are less palatable than native species, can outcompete native vegetation. Control of these invasive and noxious weeds during restoration efforts and as part of solar project development can reduce this competition, resulting in a beneficial effect. Wildfires can negatively affect desert tortoise by altering habitat structure and availability of native vegetation food sources. Projects that create firebreaks and reduce fuel sources that could result in wildfire provide beneficial effects to desert tortoise by restoring native vegetation communities, creating habitat islands, and reducing fire risk.

There are very few places available in the Northeastern Mojave Recovery Unit to translocate desert tortoise, and overcrowding of desert tortoise due to translocation can deplete habitat and resources. To minimize these impacts, solar and other projects in the region are typically designed to allow desert tortoise to re-inhabit the site following construction. Other large-scale solar projects, construction of transmission power lines, and highway improvement projects would increase habitat fragmentation that results in connectivity impacts. The presence of multiple solar, transmission line, and highway projects in the region would restrict some movement

and impact connectivity, though these impacts are anticipated to be minor as most of these projects would allow desert tortoise to re-inhabit the site after construction, with the exception of highway projects.

Construction of reasonably foreseeable future projects could increase desert tortoise mortality and injury over the short-term due to collisions with vehicles and equipment, crushing of burrows and eggs, and harm and harassment during translocation of tortoises away from construction activities. Long-term, indirect, adverse effects may result from increased predation and introduction and/or spread of invasive plant species and noxious weeds. These adverse impacts would be minimized through implementation of BMPs and conservation measures included in the reasonably foreseeable future projects. These may include measures to detect and translocate desert tortoises out of harm's way, monitor work during vegetation treatments and ground-disturbing activities, minimize spread of weeds through implementation of Integrated Weed Management Plans, and environmental awareness training for workers.

In combination, past, present, and reasonably foreseeable future actions would result in moderate to major, short- and long-term, adverse impacts on Mojave desert tortoise that overall would reduce the quantity and quality of suitable habitat within the CEAA.

#### *Proposed Action Contribution to Cumulative Impacts*

The implementation of the Proposed Action would result in minor to moderate, localized, short- and long-term, direct and indirect, adverse impacts on Mojave desert tortoise that would include direct mortality and injury during construction, O&M, and decommissioning; reduction in suitable habitat; and harassment and injury to tortoise during capture and translocation. These impacts would be minimized with the implementation of design features and BMPs (**Appendix B**), the Desert Tortoise Translocation Plans (Appendix to the Biological Opinions in **Appendix N**), and the Worker Environmental Awareness Program.

Cumulatively, effects of the Proposed Action, when combined with past, present, and reasonably foreseeable future actions, would result in major, short- and long-term, adverse effects on Mojave desert tortoise within the CEAA. Due to the relatively small size of the Projects in comparison to the CEAA (0.07 percent) and implementation of design features, BMPs, and management plans, the Proposed Action would have a minor contribution to cumulative effects on the Mojave desert tortoise within the CEAA.

#### *No Action Alternative Contribution to Cumulative Impacts*

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

#### ***Moapa Dace***

The types of projects or actions that could contribute to impacts to Moapa dace include large-scale projects with sustained withdrawals of groundwater, livestock grazing, agricultural irrigation, wind and solar development, vegetation management, and community development. The greatest threat to the Moapa dace is physical destruction or alteration of habitat. Most or all of the springs originally containing Moapa dace still flow; however, the systems have been altered for recreation, irrigation, and industrial and municipal use (USFWS 2014b). Several of the projects in **Table 3-12** would require groundwater and surface water during construction and operations, which could contribute to habitat declines for Moapa dace in the area. The sources of water for these projects are not known and the timing of their construction may or may not overlap with that of the SBSs. If water for those projects is withdrawn from the LWRFS, a cumulative impact on the regional aquifer system and the Muddy River could occur, both of which support the federally endangered Moapa dace.

Per Order #1309 (Wilson 2020), the State Engineer has determined that the maximum quantity of groundwater that can be withdrawn within the LWRFS without causing further declines in Warm Springs area flows and spring flow in the Muddy River cannot exceed 8,000 AFY. This maximum may be reduced if it is determined that pumping may adversely affect the Moapa dace.

The USFWS also tracks any groundwater pumping in the California Wash Basin (as well as other basins in the LWRFS) under a 2006 Biological Opinion (USFWS 2006) to ensure that water at the Warm Springs gage flowing into the Muddy River does not fall below 2.7 cubic feet per second (cfs) in order to prevent impacts on Moapa dace. If cumulative effects cause flows to fall below 2.7 cfs, it is expected that pumping may need to be reduced across multiple projects, including the Proposed Action. Site restoration and rehabilitation, implementation of a Moapa dace habitat restoration plan, reductions in groundwater pumping by other projects, and adequate monitoring of the resulting hydrologic conditions would minimize some of these adverse effects.

In combination, past, present, and reasonably foreseeable future actions would result in moderate, short- and long-term, direct and indirect, adverse impacts to Moapa dace that, overall, would reduce the quality and quantity of suitable habitat within the CEAA. Adherence to the requirements of the 2006 Biological Opinion (USFWS 2006) and Order #1309 (Wilson 2020) would ensure that major adverse effects would not occur.

#### Proposed Action Contribution to Cumulative Impacts

The Proposed Action would have no direct impacts on the Moapa dace, but would have minor, regional, short- and long-term, indirect, adverse impacts on the Moapa Dace. As specified in the 2006 Biological Opinion (USFWS 2006), if flows fall below 2.7 cfs at the Warm Springs gage monitored by USFWS, the water source for the SBSPs would be modified and the Applicants would secure alternative sources of water. This may be accomplished by purchasing and trucking water to the sites, by modifying construction and operations to reduce dust which would reduce dust-control water treatments, and by reducing human use during construction, decommissioning, and O&M. These measures would ensure that adequate stream flow would be maintained for Moapa dace habitat and no major adverse impact would occur.

Cumulatively, effects of the Proposed Action, when combined with past, present, and reasonably foreseeable future actions, would result in moderate, short- and long-term, adverse effects on the Moapa dace within the CEAA. Adherence to the requirements of the 2006 Biological Opinion (USFWS 2006) would ensure that major adverse effects would not occur. Due to the relatively small amount of water required for the SBSPs, the Proposed Action would have a minor contribution to cumulative effects on the Moapa dace within the CEAA.

#### No Action Alternative Contribution to Cumulative Impacts

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

### **TRAFFIC/TRANSPORTATION**

The types of projects or actions that could contribute to impacts to traffic/transportation resources include transmission lines, wind and solar development, community development, and highway improvement projects. There are a number of solar projects and transmission lines proposed for development on the Reservation and surrounding BLM-managed lands (refer to **Table 3-12**). Construction of many of these projects would increase use of I-15 and other access roads used for the SBSPs. The effect on traffic flow on I-15 and associated on/off-ramps would be greatest when construction for these projects occurs simultaneously. The projects proposed within and adjacent to the Reservation are at varying stages of the development and environmental review

process, and it is unlikely that they would all be constructed at the same time. There are numerous other solar projects and transmission lines proposed throughout the CEAA for traffic/transportation (refer to **Table 3-12**), but the proposed sites are widely spread throughout the CEAA, and it is unlikely that their development would lead to measurable impacts on any one highway or other route. There are also plans for improvements to highway interchanges in the Las Vegas area (refer to **Table 3-12**), which would have a beneficial effect on traffic/transportation within the CEAA.

In combination, past, present, and reasonably foreseeable future actions would result in minor to moderate, short- and long-term, direct and indirect, adverse and beneficial impacts to traffic/transportation that, overall, would increase traffic volume on some routes, while reducing congestion and delays on others.

#### ***Proposed Action Contribution to Cumulative Impacts***

Construction of the SBSPs would lead to a short-term increase in traffic on I-15, US 93, and North Las Vegas Boulevard. The existing vehicle traffic on these routes is well below their engineered capacity, and they are capable of accommodating the expected increase in traffic. During O&M, only five full-time equivalent workers would be employed at each facility and, therefore, there would be negligible impacts on traffic volumes. Impacts during decommissioning would be similar to, but less than, those from construction. Design features and BMPs, (**Appendix B**), and a Traffic Management Plan (**Appendix G**) would be implemented to minimize potential effects on traffic/transportation. Therefore, the Proposed Action would result in minor, short-term, adverse impacts, and negligible, localized, long-term, adverse impacts on traffic/transportation resources.

Cumulatively, effects of the Proposed Action, when combined with past, present, and reasonably foreseeable future actions, would result in minor to moderate, long-term, adverse and beneficial effects on traffic/transportation within the CEAA. The Proposed Action would have a minor contribution to the cumulative effects to traffic/transportation due to the relatively small volume of traffic that would be generated during construction and decommissioning of the SBSPs and the design features and BMPs (**Appendix B**) and Traffic Management Plan (**Appendix G**) that would be implemented to minimize impacts to traffic/transportation.

#### ***No Action Alternative Contribution to Cumulative Impacts***

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

## **VEGETATION**

The types of projects or actions that could contribute to impacts to vegetation include transmission lines, communication towers, livestock grazing, wind and solar development, vegetation management, and community development. Other disturbances that are ongoing and may affect vegetation include wildland fire and the spread and establishment of noxious weeds and invasive plant species. The majority of lands within the CEAA for vegetation (76.7 percent) are federally managed; vegetation and weed management activities on these lands would have beneficial impacts on vegetation. The BLM has a number of ongoing and planned vegetation management projects (see **Table 3-12**) that may directly and indirectly affect vegetation within the CEAA. These projects are designed to restore native vegetation communities and enhance habitat for Mojave desert tortoise. The BLM also includes conservation measures in grazing lease renewals that are designed to minimize the introduction and spread of invasive plant species and noxious weeds and promote native vegetation communities. These projects would have long-term beneficial impacts to vegetation within the CEAA. On the other hand, the large number of solar facilities and transmission lines proposed or planned within the CEAA for vegetation would lead to the long-term loss of thousands of acres of native vegetation (see **Table 3-12**). Site

restoration and rehabilitation and implementation of Integrated Weed Management Plans and Fire Management Plans associated with these projects would minimize the potential effects to vegetation and may lead to long-term benefits from improved weed control and reduced risk of catastrophic wildfires.

In combination, past, present, and reasonably foreseeable future actions would result in moderate, long-term, adverse and beneficial impacts to vegetation that, overall, would reduce the extent and health of native vegetation communities in some areas while improving it in others.

#### ***Proposed Action Contribution to Cumulative Impacts***

The implementation of the Proposed Action, including both onsite and offsite facilities, would result in the temporary loss of approximately 3,115 acres of vegetation and the permanent loss of 547 acres of vegetation. The vast majority of vegetation loss would occur within the creosote scrub vegetation community but would represent a tiny fraction of available creosote scrub habitat in the CEAA (approximately 0.2 percent). With the implementation of design features and BMPs (**Appendix B**), there would be minor, localized, short- and long-term, direct and indirect, adverse impacts on vegetation as a result of the Proposed Action.

Cumulatively, effects of the Proposed Action, when combined with past, present, and reasonably foreseeable future actions, would result in moderate, long-term, adverse and beneficial effects on vegetation within the CEAA. The Proposed Action would have a minor contribution to the cumulative effects to vegetation due to the relatively small area of vegetation that would be permanently lost from construction of the SBSPs and the design features and BMPs (**Appendix B**) that would be implemented to minimize impacts to vegetation. Vegetation impacts created by the solar facilities would be largely reversible with decommissioning of the Proposed Action at the end of its useful life and restoration of the landscape.

#### ***No Action Alternative Contribution to Cumulative Impacts***

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

### **VISUAL RESOURCES**

The types of projects or actions that could contribute to impacts to visual resources include overhead transmission lines, communication towers, wind and solar development, vegetation management, and community development. These actions generally result in a transformation of the natural landscape to a more developed setting when viewed during both day and night conditions over the long-term. The reasonably foreseeable future actions that have been identified (**Table 3-12**) would contribute to the overall cumulative impacts to visual resources, and it is anticipated that the level of impact associated with these identified projects would be moderate to major. Impacts of the combined actions would be perceived as strongest where viewed from SVPs and traditional areas identified by Native American tribes. The implementation of the respective visual management objectives for BLM lands within the visual resources CEAA would include measures to reduce impacts.

In combination, past, present, and reasonably foreseeable future actions would result in moderate to major, long-term, direct and indirect, adverse impacts to visual resources that, overall, would reduce scenic quality and notably transform the characteristic landscape.

***Proposed Action Contribution to Cumulative Impacts***

Under the Proposed Action, the short-term impacts during construction and decommissioning would range from a minor to moderate degree of change in the characteristic landscape and scenic quality and would be visible from the four SVPs (Moapa Travel Center, I-15, Valley of Fire Road, and the OSNHT). There would be approximately 3,534 acres of impacted landscape under the Proposed Action that would reduce the overall scenic quality and modify the landscape character due to the cultural modifications by the proposed solar facilities and ancillary components. The long-term impacts from O&M on the existing landscape character and scenic quality would be moderate and visible from the four SVPs. The magnitude of change in landscape character and reduction in scenic quality associated with the Proposed Action would be moderate due to the dominant scale of the Proposed Action in comparison to the predominantly flat landscape and low stature vegetation. Therefore, there would be minor to moderate, short- and long-term, adverse impacts on views from the four SVPs within the foreground/middleground and background of the Proposed Action.

Cumulatively, effects of the Proposed Action, when combined with past, present, and reasonably foreseeable future actions, would result in moderate to major, long-term, adverse impacts to visual resources within the CEAA. The Proposed Action would have a minor to moderate contribution to the cumulative effects to visual resources because of the scale and strong contrast of the solar facilities in a relatively flat and wide, sparsely populated area with existing solar projects in place. Visual resource impacts created by the solar facilities would be largely reversible with decommissioning of the Proposed Action at the end of its useful life and restoration of the landscape.

***No Action Alternative Contribution to Cumulative Impacts***

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

**WATER RESOURCES (SURFACE/GROUND)**

The types of projects or actions that could contribute to impacts to water resources include transmission lines, wind and solar development, vegetation management, off-highway recreation, agricultural uses, and community development. Other disturbances that are ongoing and may affect water resources include wildland fire and the spread and establishment of noxious weeds and invasive plant species. Ground-disturbance associated with many of these actions could lead to increased soil erosion and stormwater runoff that could adversely impact surface water quality. Stormwater runoff from most projects would be minimized through the implementation of SWPPPs. Chemicals used in agriculture and vegetation management could be carried to surface water in runoff and adversely impact water quality. Accidental spills and leaks of potentially hazardous materials associated with some of the projects could contaminate surface and groundwater if not properly contained. The spread of noxious and invasive weeds also has the potential to affect surface and groundwater. Large infestations of saltcedar can contribute to declining groundwater levels in local aquifers, which could potentially reduce surface water flows associated with these aquifers. Pumping of groundwater to provide water needed for projects within the CEAA could cause a decline in groundwater levels in the local aquifer. The spread of noxious and invasive weeds can also increase the frequency and severity of wildland fires. Large fires remove vegetative cover important for stabilizing soils and intercepting precipitation, which can lead to substantial increases in soil erosion, stormwater runoff, and subsequent sedimentation in nearby waterbodies.

The majority of lands within the CEAA for water resources (76.7 percent) are federally managed; vegetation and weed management activities on these lands would have beneficial impacts on water resources by restoring native vegetation communities and reducing the risk of future wildland fires. The BLM has a number of ongoing

and planned vegetation management projects (**Table 3-12**) that would have similar effects on water resources within the CEAA. The large number of solar facilities and transmission lines proposed or planned within the CEAA for water resources would lead to the long-term disturbance of thousands of acres (**Table 3-12**). Solar projects would alter surface and stormwater flows over a large area for an extended period of time. Federal, State, and local permitting requirements (such as SWPPP implementation) and design features incorporated in these projects would minimize the potential effects to surface water. Impacts from transmission line projects would generally be short-term as the small footprint of these structures once constructed would not substantially surface and stormwater flows. Several of the projects in **Table 3-12** would require groundwater and surface water during construction and operations, which could contribute to declining groundwater in the region. The sources of water for these projects are not known and the timing of their construction may or may not overlap with that of the SBSPs. If water for those projects is withdrawn from the LWRFS, a cumulative impact on the regional aquifer system and the Muddy River could occur. Per Order #1309 (Wilson 2020), the State Engineer has set a limit on the maximum quantity of groundwater that can be pumped from the LWRFS annually. This limit would prevent overdraft of the aquifer and would minimize the potential impacts to groundwater in the region. The implementation of spill prevention and control measures would minimize the potential for projects to adversely affect groundwater quality.

In combination, past, present, and reasonably foreseeable future actions would result in moderate, short- and long-term, direct and indirect, adverse and beneficial impacts to water resources that, overall, would deteriorate water quality and quantity in some areas while improving it in others.

#### ***Proposed Action Contribution to Cumulative Impacts***

Water for the Projects would be obtained under the authority of the Moapa Band's existing water rights on the Reservation and would not impact the availability of groundwater within the region. Impacts to surface and groundwater quality from leaks and spills of hazardous materials would be minimized by implementing the Hazardous Materials and Waste Management Plan and Spill Prevention and Emergency Response Plan which would be prepared by the Applicants prior to implementation of the Projects. Impacts from soil erosion and stormwater runoff would be minimized by implementing the SWPPP. The Projects have been designed to avoid construction with floodplains and large washes and to allow all surface flows upstream of the site to continue flowing to the ephemeral drainages downstream of the site. Therefore, with the implementation of design features and BMPs (**Appendix B**), the Proposed Action would have minor, regional, short- and long-term, direct and indirect, adverse impacts on water resources.

Cumulatively, effects of the Proposed Action, when combined with past, present, and reasonably foreseeable future actions, would result in moderate, short- and long-term, adverse and beneficial effects on water resources within the CEAA. The Proposed Action would have a minor contribution to the cumulative effects to water resources due to the relatively small area that would be permanently impacted and the design features and BMPs (**Appendix B**) that would be implemented to minimize impacts to water resources. Impacts to water resources caused by the solar facilities would be largely reversible with decommissioning of the Proposed Action at the end of its useful life and restoration of the landscape.

#### ***No Action Alternative Contribution to Cumulative Impacts***

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



### 3.9 Irreversible and Irretrievable Commitments of Resources

A commitment of resources is irreversible when its primary or secondary impacts limit the future option for a resource. An irretrievable commitment refers to the use or consumption of resources that are neither renewable nor recoverable for later use by future generations and represents a permanent effect. Construction and decommissioning of the SBSPs would require a commitment of natural, physical, human, and fiscal resources; O&M would require similar commitment of these resources. This section describes the irreversible and irretrievable commitments and unavoidable adverse impacts that would occur as a result of the construction, O&M, and decommissioning activities associated with the SBSPs.

Construction of the SBSPs would require the use of fossil fuels for construction vehicles, equipment, and construction-worker vehicles. Electricity would also be used at construction trailers and other facilities during construction. Solar energy is a renewable resource that would not be depleted or altered by Proposed Action and could offset the need to consume fossil fuels.

Construction of the SBSPs would require the use of various types of raw building materials, including cement, aggregate, steel, electrical supplies, piping, and other building materials such as metal, stone, sand, and fill material. Additionally, the fabrication and preparation of these construction materials would require labor and natural resources. Utilization of these resources would be irretrievable. However, these resources are readily available at this time and effects on their continued availability would not be expected.

The loss of 549 acres of habitat from construction of the SBSPs would result in an unavoidable adverse impact to vegetation and wildlife habitat for the life of the Projects. The loss of productivity (i.e., forage, wildlife habitat) from lands devoted to Project facilities would be an irreversible and irretrievable commitment during the time that those lands are out of production and until they are successfully revegetated. The permanent loss of soil and vegetation within small and highly localized areas that would not be reclaimed would result in irreversible and irretrievable impacts on soils and vegetation. The loss of 549 acres of native vegetation would not be expected to cause an irreversible and irretrievable commitment of the resource on a regional basis. Localized and long-term, unavoidable, adverse impacts on wildlife, including special status species, would occur. Unavoidable impacts to desert tortoise would occur and would be mitigated by the terms of the take permit that would be issued for Projects.

The Projects are expected to create an average of 300, and up to 750, construction jobs for each facility. Construction of SBSP I is expected to take approximately 14 to 16 months and construction of SBSP II is expected to take approximately 8 to 10 months. The two Projects may be constructed simultaneously or sequentially. After the SBSPs are commissioned, up to 5 full time-equivalent positions would be required to operate and maintain each facility and provide security, for a total of 10 permanent positions. Construction and operation of the proposed facilities would require labor, which would be otherwise unavailable for other projects. The commitment of labor is considered irretrievable. This commitment of labor, while irretrievable, would not be considered an effect because the SBSPs would be supplying employment opportunities. This employment would have a beneficial impact on the local economy. The Projects would provide long-term lease and ROW revenues to the Moapa Band and increase local spending which would also be beneficial. Furthermore, fiscal resources would be irretrievably committed to construction and operation of the SBSPs. These funds would then not be available for other projects and activities. It is anticipated that the SBSPs would have a positive effect on the local population including members of the Moapa Band by creating both temporary and long-term jobs as well as lease revenues. No unavoidable adverse impacts or irreversible and irretrievable commitments of these resources are expected.

The SBSPs would limit future use of approximately 3,600 acres of the Reservation for other uses over the operational life of the SBSPs (up to 50 years, including construction and decommissioning). This would not irreversibly and irretrievably commit the land resource as the use could change after the Projects are decommissioned.

As discussed in **Table 3-1** in Section 3.1, the primary drainages on the solar site would not be impacted. Smaller drainages may be affected, and erosion and sediment flow could be increased temporarily during and after construction. While these impacts would occur, due to the implementation of design features and BMPs (**Appendix B**), the unavoidable adverse risk of flooding and sediment production would be negligible. Contamination of surface water could occur as a result of spills associated with the SBSPs but implementation of BMPs that will be outlined in the Spill Prevention and Emergency Response Plan, which would be prepared by the Applicants prior to implementation of the Projects, would make the unavoidable adverse impact negligible.

The SBSPs would also withdraw water for construction and O&M from an existing well on the Reservation. The use of groundwater from wells for construction, O&M, and decommissioning activities would be irretrievable since they would either be used for consumptive purposes, such as applied for dust control and lost to evapotranspiration. Groundwater losses associated with the SBSPs would, over time, be replenished through natural processes.

Under the Proposed Action, the landscape would appear to be substantially altered and would begin to dominate the visual setting of the Project area. The change in landscape character and scenic quality associated with the proposed solar facilities would attract attention due to the visual contrast in terms of form, color, and dominant scale in comparison to the predominantly flat landscape and low stature vegetation. The proposed solar facilities would be visible and attract attention from I-15, Valley of Fire Road, the OSNHT, and the Moapa Travel Center SVPs depending on viewing distance, visibility conditions, direction of travel, and time of day. Construction of the SBSPs would cause unavoidable, short- and long-term, adverse impacts on visual resources by adding features to the viewshed that would attract attention and notably change the landscape character and scenic quality in the setting. However, this impact would not be an irreversible or irretrievable commitment of visual resources as these features would be removed during decommissioning.

The No Action Alternative would represent no irreversible and irretrievable commitment of resources or unavoidable impacts in relation to the Proposed Action. However, the No Action Alternative may represent possible impacts to resources on a regional basis because the amount of energy required to meet demand would need to be produced from other sources. Insufficient information exists to say that the demand and subsequent supply would be from other renewable energy sources.

### **3.10 Relationship Between Short-Term Uses and Long-Term Productivity of the Environment**

Construction, operation, and maintenance of the SBSPs would result in the loss of resources over the life of the Projects. Impacts to water, biological, and visual resources would occur. While there would be irreversible and irretrievable commitments of some resources, as noted above, there would be no permanent loss of the overall productivity of the environment due to the proposed SBSPs.

# CHAPTER 4 LIST OF PREPARERS AND CONSULTATION/COORDINATION

## 4.1 List of Preparers and Reviewers

Below is a list of the individuals who contributed to the development of this EIS.

Name	Title/Responsibility
<b>Bureau of Indian Affairs (BIA), Western Regional Office</b>	
Chip Lewis	BIA Project Lead/Regional Environmental Protection Officer
Bryan Bowker	Regional Director
Garry J. Cantley	Regional Archeologist
Tamera Dawes	Realty Specialist
Christina Varela	Realty Specialist
<b>BIA Southern Paiute Agency</b>	
Clarence Begay	Agency Superintendent
<b>Department of the Interior (DOI), Office of the Solicitor</b>	
Christopher Andres Ruedas	Attorney-Advisor, DOI Office of the Solicitor
<b>Moapa Band of Paiute Indians</b>	
Laura Parry	Chairwoman
Rayanne Walters	Executive Assistant
Terry Bohl	Director of Business Enterprises
<b>Bureau of Land Management (BLM) Las Vegas Field Office</b>	
Whitney Wirthlin	Acting Energy & Infrastructure Project Manager
Nicholas Pay	Renewable Energy
Vivian Browning	Realty Specialist
<b>U.S. Environmental Protection Agency (EPA)</b>	
Karen Vitulano	Environmental Review
<b>U.S. Fish and Wildlife Service (USFWS)</b>	
Glen Knowles	Field Supervisor
Kelly Douglas	Threatened and Endangered Species
Nic Huber	Threatened and Endangered Species
Jessica Zehr	Threatened and Endangered Species
Roy Averill-Murray	Desert Tortoise Recovery Coordinator
Kimberleigh Field	Desert Tortoise Recovery Biologist
<b>Logan Simpson, EIS Consultant</b>	
Patricia McCabe	Project Manager
Diane Simpson-Colebank	Visual Resources
Lisa Young	Biological Resources
Nicholas Brasier	Noxious Weeds

Name	Title/Responsibility
Angela Muszynski	Water Resources
Dylan George-Sills	Visual Resources
Jesse Westad, WERK	Visual Simulations
Marshall Hayes	Socioeconomics, Land Use
Ian Tackett	Biological Resources
Roy Baker	GIS Mapping
Mary Barger	Cultural Resources
<b>OTHERS</b>	
Randy Schroeder, EnValue	Consultant to BIA – Environmental Planning
Patrick Golden, Heritage EC	Biological Assessments
Scott Yanco, Clear Path Environmental	Biological Resources
AJ Thompson, Knight & Leavitt	Cultural Resources

## 4.2 Consultation and Coordination

The BIA informed the public, landowners, government agencies, tribes, and interested stakeholders about the proposed Projects and solicited their comments.

### 4.2.1 Public Scoping

The NOI to prepare an EIS was published in the Federal Register on May 8, 2020. The BIA announced the Projects and the initiation of the scoping process, held virtual public scoping meetings, and invited the public to comment and ask questions. Federal, State, and local agencies that could be interested or may be affected by the proposed Projects were contacted to request their participation. Public scoping meetings were publicized in the Federal Register, on the Project website, in letters mailed to interested stakeholders, through public notices published in local newspapers, and in the Moapa Band newsletter. These outreach and notification activities are described in more detail in the Scoping Report in **Appendix A**.

In addition, over 70 scoping letters were sent by the BIA to various non-governmental organizations and other interested stakeholders. The scoping letter briefly described the Projects (including maps), outlined the federal review process, announced the public scoping meetings, and described the various ways to provide comments. A Project website: <https://www.southernbighornsolar.com> was also available to the public and provided Project information as well as an online comment form.

A legal notice/public notice announcing the public scoping meetings was published in two local newspapers on May 11, 13, 18, and 20, 2020.

The BIA hosted two virtual public information and scoping meetings on May 27 and 28, 2020.

Details about the public scoping process and the input received can be found in the Scoping Report included in **Appendix A** of this EIS.

## 4.2.2 Consultation with Others

In addition to the outreach to public stakeholders, the following federal, State, and local agencies were provided an opportunity to consult during preparation of the EIS:

- Moapa Band of Paiute Indians (cooperating agency)
- Bureau of Land Management (cooperating agency)
- U.S. Fish and Wildlife Service (cooperating agency)
- US Environmental Protection Agency, Region 9 (cooperating agency)
- Nellis Air Force Base
- Nevada Department of Wildlife
- National Park Service
- Nevada Department of Conservation and Natural Resources
- Nevada Department of Air Quality and Environmental Management
- Nevada Division of Environmental Protection
- Nevada State Historic Preservation Office
- Nevada Department of Transportation
- Nevada Natural Heritage Program
- Conservation District of Southern Nevada
- Nevada Energy
- Natural Resources Conservation Service (Mojave Special Projects Office)
- Nevada Department of Transportation
- U.S. Army Corps of Engineers
- Federal Aviation Administration
- Clark County
- Clark County Flood Control District
- Clark County Department of Air Quality
- City of Mesquite
- Southern Nevada Water Authority
- The Honorable Jack Rosen, U.S. Senate
- The Honorable Catherine Masto, U.S. Senate
- The Honorable Dina Titus, U.S. House of Representatives
- The Honorable Mark Amodei, U.S. House of Representatives
- The Honorable Steve Horsford, U.S. House of Representatives
- The Honorable Susie Lee, U.S. House of Representatives

## 4.2.3 Non-Governmental Organizations

The following non-governmental organizations were provided an opportunity to comment during preparation of the EIS:

- The Nature Conservancy
- Lahontan Audubon Society
- Red Rock Audubon Society
- Desert Tortoise Council
- Friends of Nevada Wilderness
- Nevada Wilderness Project
- Sierra Club
- Center for Biological Diversity
- Nevada Clean Energy Campaign
- Center for Energy Efficiency and Renewable Technologies
- Great Basin Resource Watch
- Nevada Wildlife Federation
- Nevada Natural Resource Education Council
- Natural Resources Defense Council
- Nevada Conservation League
- Western Resource Advocates
- Environmental Defense Fund

- Conservation District of Southern Nevada
- Sierra Nevada Alliance
- Friends of Gold Butte
- Union Pacific Railroad Company
- Kern River Pipeline
- Old Spanish Trail Association

Non-governmental organizations, private citizens, and State and federal agencies provided comments during the public scoping period. See **Appendix A** for details on the comments received during scoping.

#### **4.2.4 Native American Tribes**

Under consultation provisions of the National Historic Preservation Act, BIA approached the following tribes to ask if they attached religious or cultural significance to any historic properties in the APEs:

- Las Vegas Paiute Tribe
- Kaibab Band of Paiute Indians
- Hualapai Indian Tribe
- Fort Mojave Indian Tribe
- Hopi Tribe
- Colorado River Indian Tribes
- Chemehuevi Indian Tribe
- Paiute Indian Tribe of Utah

# CHAPTER 5 REFERENCES

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