DES 11-49 • DOE/EIS-0403D-S

October 2011

BLM

DOE

Supplement to the Draft
Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States

U.S. DEPARTMENT OF ENERGY

On the cover:
Typical Solar Fields for Various Technology Types (clockwise from upper left):
Solar Parabolic Trough (Source: NREL/SR-550-32282),
Solar Power Tower (Credit: Sandia National Laboratories. Source: NREL),
Photovoltaic (Credit: Arizona Public Service. Source: NREL), and
Dish Engine (Credit: R. Montoya. Source: Sandia National Laboratories).

Background photo: Parabolic trough facility from an elevated viewpoint
(Credit: Argonne National Laboratory)

United States Department of the Interior
BUREAU OF LAND MANAGEMENT
Washington, D.C. 20240
http://www.blm.gov

TAKE PRIDE IN AMERICA

October 2011

In Reply Refer To:
1610 (300)

Dear Reader:

Attached for your review and comment is the Supplement to the Draft Programmatic Environmental Impact Statement (PEIS) for Solar Energy Development in Six Southwestern States (Supplement). This document was prepared by the Bureau of Land Management (BLM) and the Department of Energy (DOE) as co-lead agencies. The BLM and DOE prepared this document in consultation with cooperating agencies and in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended; the Council on Environmental Quality, DOE, and Department of the Interior regulations implementing NEPA (40 CFR Parts 1500-1508, 10 CFR Part 1021, 43 CFR Part 46); and the Federal Land Policy and Management Act of 1976, as amended.

On December 17, 2010, the lead agencies published a Draft PEIS for Solar Energy Development in Six Southwestern States. Public comments were accepted through May 2, 2011, and more than 80,500 comments were received. The lead agencies have thoroughly analyzed the comments and made numerous adjustments to the PEIS in response to this input. The Supplement focuses on modified and new components of the lead agencies' proposed solar programs and incorporates by reference relevant portions of the Draft PEIS.

Development of this Supplement allows the public an opportunity to evaluate the modified and new elements of the proposed programs and provide input to assist the BLM and DOE decision-making processes. Based on input received on the Draft PEIS and this Supplement, the lead agencies will prepare a Final PEIS and Record(s) of Decision. All comments received on both documents will be responded to in the Final PEIS.

Through the Supplement, the BLM has modified its preferred alternative to emphasize its commitment to the concept of Solar Energy Zones (SEZ). Efforts have been made to ensure that SEZs are not located in high conflict areas, a protocol for establishing new SEZs has been provided, and incentives for projects within SEZs have been outlined. In addition, the BLM has revisited ongoing state-based planning efforts to assure that such efforts could result in the identification of new zones.

While the BLM's preferred alternative emphasizes the use and creation of SEZs for utility-scale solar energy development, the BLM has also proposed a process that will accommodate responsible development outside of SEZs.

As described in the Draft PEIS, under DOE's proposed action (action alternative), DOE would develop and adopt programmatic environmental guidance that would be used by DOE to further integrate environmental considerations into its analysis and selection of proposed solar projects. DOE has since used the information about environmental impacts provided in the Draft PEIS and other information to develop draft programmatic guidance. DOE has included the draft programmatic guidance in the Supplement for public comment.

Your timely comments on the Supplement will help formulate the Final PEIS. Comments will be accepted for ninety (90) calendar days following the Environmental Protection Agency's publication of its Notice of Availability in the *Federal Register*. The BLM and DOE can best utilize your comments and resource information submissions if received within the review period. Comments received after the end of the review period will be considered to the extent practicable. We request that your comments be as specific as possible. Comments are more helpful if they reference a section or page number of the Supplement and include suggested changes, additional information sources, or alternative methodologies.

Comments may be submitted electronically using the online comment form available at the project Web site: http://solareis.anl.gov. To facilitate analysis of comments and information submitted, we strongly encourage you to submit comments through the project Web site. Comments may also be submitted by mail to Solar Energy Draft PEIS, Argonne National Laboratory, 9700 S. Cass Avenue—EVS/240, Argonne, Illinois 60439.

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

In addition to written comments, public meetings to take public comments will be announced through local media and Web sites. Public meetings are currently planned for the following locations:

El Centro, California
Palm Desert, California
Phoenix, Arizona
Las Vegas, Nevada

Copies of the Supplement have been sent to affected Federal, state, and local government agencies and applicable tribal governments. Requests for additional information on the Supplement, including requests for copies of the document, should be directed to Shannon Stewart, BLM Washington Office, by email at shannon_stewart@blm.gov, or by telephone at 202–912–7219; or Jane Summerson, DOE Solar PEIS Document Manager, by email at Jane.summerson@ee.doe.gov, or by telephone at 202-287-6188. You may also visit the Solar Energy Development PEIS Web site at http://solareis.anl.gov.

Thank you for your continued interest in the PEIS for Solar Energy Development in Six Southwestern States. We appreciate the information and suggestions you contribute to the NEPA and planning process.

Sincerely,

Michael D. Nedd
Assistant Director
Minerals and Realty Management

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Supplement to the Draft
Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States

October 2011

Bureau of Land Management
U.S. Department of Energy

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NOTATION

The following is a list of acronyms, abbreviations, and units of measure used in this document. Some acronyms used only in tables may be defined only in those tables.

GENERAL ACRONYMS AND ABBREVIATIONS

AC	alternating current
ACEC	Area of Critical Environmental Concern
ACHP	Advisory Council on Historic Preservation
ADEQ	Arizona Department of Environmental Quality
ADWR	Arizona Department of Water Resources
AGL	above ground level
AUM	animal unit month
AZGFD	Arizona Game and Fish Department
BLM	Bureau of Land Management
BLM-CA	Bureau of Land Management, California
BOR	U.S. Bureau of Reclamation
CAReGAP	California Regional Gap Analysis Project
CDCA	California Desert Conservation Area
CDFG	California Department of Fish and Game
CDOW	Colorado Division of Wildlife
CDWR	Colorado Division of Water Resources
CEC	California Energy Commission
CFR	*Code of Federal Regulations*
CIMIS	California Irrigation Management Information System
CNPS	California Native Plant Society
CSP	concentrating solar power
CWA	Clean Water Act
DLT	dedicated-line transmission
DoD	U.S. Department of Defense
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
DRECP	Desert Renewable Energy Conservation Plan
DSRP	Decommissioning and Site Reclamation Plan
DWMA	Desert Wildlife Management Area
EA	environmental assessment
EIS	environmental impact statement
E.O.	Executive Order

EPA	U.S. Environmental Protection Agency
EPRI	Electric Power Research Institute
ESA	Endangered Species Act of 1973
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FLPMA	Federal Land Policy and Management Act of 1976
FONSI	Finding of No Significant Impact
FR	*Federal Register*
FRCC	Florida Reliability Coordinating Council
GHG	greenhouse gas
HMA	Herd Management Area
HUC8	8-digit hydrologic unit code
I	Interstate
IBLA	Interior Board of Land Appeals
IID	Imperial Irrigation District
IM	Instruction Memorandum
ISO	independent system operator
ITFR	Interim Temporary Final Rule
KGRA	known geothermal resource area
KOP	key observation point
LTVA	long-term visitor area
MILP	mixed-integer linear programming
MOA	Military Operating Area
MTR	military training route
NAHC	Native American Heritage Commission (California)
NCA	National Conservation Area
NDOW	Nevada Department of Wildlife
NEPA	National Environmental Policy Act of 1969
NHD	National Hydrology Dataset
NHPA	National Historic Preservation Act
NLCS	National Landscape Conservation System
NMDGF	New Mexico Department of Game and Fish
NMED	New Mexico Environment Department
NNHP	Nevada Natural Heritage Program
NP	National Park
NPS	National Park Service

NPV	net present value
NRCS	Natural Resources Conservation Service
NRDC	Natural Resources Defense Council
NREL	National Renewable Energy Laboratory
NRHP	*National Register of Historic Places*
NRS	*Nevada Revised Statutes*
NTTR	Nevada Test and Training Range
NWI	National Wetlands Inventory
NWIS	National Water Information System
NWR	National Wildlife Refuge
OHV	off-highway vehicle
PCA	Potential Conservation Area
PEIS	programmatic environmental impact statement
PFYC	potential fossil yield classification
PITU	Paiute Indian Tribe of Utah
P.L.	Public Law
PM	particulate matter
$PM_{2.5}$	particulate matter with an aerodynamic diameter of 2.5 μm or less
PM_{10}	particulate matter with an aerodynamic diameter of 10 μm or less
PPA	Power Purchase Agreement
P-P-D	population-to-power density
POD	Plan of Development
PSD	prevention of significant deterioration
PV	photovoltaic
REA	Rural Electrification Act of 1936
RCE	Reclamation Cost Estimate
RDEP	Restoration Design Energy Project
REAT	Renewable Energy Action Team
REDA	Renewable Energy Development Area
REEA	Renewable Energy Evaluation Area
REPG	Renewable Energy Policy Group
RFDS	reasonably foreseeable development scenario
RMP	Resource Management Plan
ROD	Record of Decision
ROW	right-of-way
RPS	Renewable Portfolio Standard
RSI	Renewable Systems Interconnection
RTO	regional transmission organization
SEZ	solar energy zone
SHPO	State Historic Preservation Office(r)
SLT	shared-line transmission
SLVRCA	San Luis Valley Renewable Communities Alliance

SNWA	Southern Nevada Water Authority
SRMA	Special Recreation Management Area
SUA	special use airspace
SVL	sensitive viewing location
SVRA	sensitive visual resource area
SWReGAP	Southwest Regional Gap Analysis Project
TDS	total dissolved solids
TEPPC	Transmission Expansion Planning Policy Committee
UDWR	Utah Division of Wildlife Resources
USC	*United States Code*
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UTTR	Utah Test and Training Range
VRI	Visual Resource Inventory
VRM	Visual Resource Management
WA	Wilderness Area
WECC	Western Electricity Coordinating Council
WHMA	Wildlife Habitat Management Area
WIU	Wilderness Inventory Unit
WRCC	Western Regional Climate Center
WSA	Wilderness Study Area
WWP	Western Watersheds Project

UNITS OF MEASURE

ft	foot (feet)	m^2	square meter(s)
ft^2	square foot (feet)	mi	mile(s)
		mi^2	square mile(s)
km	kilometer(s)	mm	millimeter(s)
km^2	square kilometer(s)	MW	megawatt(s)
kV	kilovolt(s)	MWh	megawatt-hour(s)
kWh	kilowatt-hour(s)	MVA	megavolt-ampere(s)
m	meter(s)	µm	micrometer(s)

ENGLISH/METRIC AND METRIC/ENGLISH EQUIVALENTS

The following table lists the appropriate equivalents for English and metric units.

Multiply	By	To Obtain
English/Metric Equivalents		
acres	0.004047	square kilometers (km^2)
acre-feet (ac-ft)	1,234	cubic meters (m^3)
cubic feet (ft^3)	0.02832	cubic meters (m^3)
cubic yards (yd^3)	0.7646	cubic meters (m^3)
degrees Fahrenheit (°F) –32	0.5555	degrees Celsius (°C)
feet (ft)	0.3048	meters (m)
gallons (gal)	3.785	liters (L)
gallons (gal)	0.003785	cubic meters (m^3)
inches (in.)	2.540	centimeters (cm)
miles (mi)	1.609	kilometers (km)
miles per hour (mph)	1.609	kilometers per hour (kph)
pounds (lb)	0.4536	kilograms (kg)
short tons (tons)	907.2	kilograms (kg)
short tons (tons)	0.9072	metric tons (t)
square feet (ft^2)	0.09290	square meters (m^2)
square yards (yd^2)	0.8361	square meters (m^2)
square miles (mi^2)	2.590	square kilometers (km^2)
yards (yd)	0.9144	meters (m)
Metric/English Equivalents		
centimeters (cm)	0.3937	inches (in.)
cubic meters (m^3)	0.00081	acre-feet (ac-ft)
cubic meters (m^3)	35.31	cubic feet (ft^3)
cubic meters (m^3)	1.308	cubic yards (yd^3)
cubic meters (m^3)	264.2	gallons (gal)
degrees Celsius (°C) +17.78	1.8	degrees Fahrenheit (°F)
hectares (ha)	2.471	acres
kilograms (kg)	2.205	pounds (lb)
kilograms (kg)	0.001102	short tons (tons)
kilometers (km)	0.6214	miles (mi)
kilometers per hour (kph)	0.6214	miles per hour (mph)
liters (L)	0.2642	gallons (gal)
meters (m)	3.281	feet (ft)
meters (m)	1.094	yards (yd)
metric tons (t)	1.102	short tons (tons)
square kilometers (km^2)	247.1	acres
square kilometers (km^2)	0.3861	square miles (mi^2)
square meters (m^2)	10.76	square feet (ft^2)
square meters (m^2)	1.196	square yards (yd^2)

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1 INTRODUCTION

1.1 OVERVIEW

On December 17, 2010, the U.S. Department of the Interior Bureau of Land Management (BLM) and U.S. Department of Energy (DOE) working jointly as lead agencies published a *Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States* (Solar PEIS [BLM and DOE 2010]). Public comments were accepted through May 2, 2011. More than 80,500 comments were received. The public, as well as many cooperating agencies and key stakeholders, offered suggestions on how the BLM and DOE could increase the utility of the document, strengthen elements of the proposed Solar Energy Program, and increase certainty regarding solar energy development on BLM-administered lands.

The lead agencies have made adjustments to the Solar PEIS to better meet the BLM and DOE's solar energy program objectives. The lead agencies have prepared this targeted Supplement to the Draft Solar PEIS (Supplement) that includes modified and new components of the BLM's proposed Solar Energy Program, DOE's proposed programmatic environmental guidance, and references to relevant portions of the Draft Solar PEIS. The Supplement also updates the environmental effects analysis associated with the BLM's modified action alternatives. Because of its programmatic nature, the Supplement analyzes environmental effects over a broad geographic and time horizon, focusing on major impacts in a qualitative manner (see Section 1.5).

The BLM and DOE have prepared this document in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended; the Council on Environmental Quality; the DOE and the U.S. Department of the Interior (DOI) regulations implementing NEPA; and the Federal Land Policy and Management Act (FLPMA) of 1976, as amended.

Through this Supplement, the BLM has modified its preferred alternative to emphasize its commitment to the concept of solar energy zones (SEZs). Efforts have been made to ensure that SEZs are not located in high conflict areas; a protocol for identifying new SEZs has been provided; and incentives for projects within SEZs have been outlined. In addition, the BLM has revisited ongoing state-based planning efforts to ensure that such efforts could result in the identification of new SEZs. While the BLM's preferred alternative emphasizes the use and creation of SEZs for utility-scale solar energy development, it also includes a proposed process that will accommodate responsible development outside of SEZs.

As described in DOE's proposed action in the Draft Solar PEIS, DOE would develop and adopt programmatic environmental guidance which would be used by DOE to further integrate environmental considerations into its analysis and selection of proposed solar projects. DOE has used the information about environmental impacts provided in the Draft Solar PEIS and other information to develop draft programmatic guidance. DOE has included the draft programmatic guidance in this Supplement for public comment.

Release of this Supplement allows the public an opportunity to evaluate the modified and new components of the proposed program and provide input that will assist the BLM and DOE in their decision-making process. On the basis of input received on the Draft Solar PEIS and this Supplement, the lead agencies will prepare a Final Solar PEIS and Record(s) of Decision (ROD).

1.2 SUMMARY OF COMMENTS

There were several types of commentors on the Draft Solar PEIS representing a wide range of concerns: individual members of the public; federal, state, and local governmental agencies; Tribes; solar companies and solar industry organizations; environmental organizations; utilities; ranchers; water districts; and many other types of organizations.

The following paragraphs present the most prevalent concerns conveyed in the comments on the Draft Solar PEIS. In instances where this Supplement addresses these concerns, cross references to the associated sections of this Supplement are provided.

The largest number of comments on the Draft Solar PEIS came from members of environmental organizations (e.g., Defenders of Wildlife, National Resources Defense Council, Sierra Club, The Wilderness Society, and the Wildlife Federation Action Club). These environmental organizations and many individual commentors stated opposition to BLM's preferred solar energy development program alternative (referred to as the "program alternative") and favored a modified solar energy zone program alternative ("SEZ alternative"), under which several of the proposed SEZs would be dropped and the boundaries of others would be revised. Cooperating agencies, as well as state and local governments, also recommended deleting some proposed SEZs, reducing the size of some SEZs, restricting the type of development within some SEZs, and removing some of the lands from the program alternative. See Sections 2.2 and 2.3 of this Supplement for a discussion of the BLM's proposed modified action alternatives and its preferred alternative, and Appendices B and C for discussions of proposed changes to individual SEZs.

A broad range of commentors (industry, agencies, and environmental organizations) noted the need for an explicit process for identifying new SEZs to meet the projected future level of solar development. The BLM was urged to develop such a process as a part of the Final Solar PEIS. See Section 2.2.2.2.5 and Appendix D of this Supplement for discussion of a proposed new SEZ identification protocol. Some states have already initiated efforts to identify new SEZs, including the Restoration Design Energy Project (RDEP) in Arizona and the Desert Renewable Energy Conservation Plan (DRECP) in California. See Section 2.2.2.2.6 of this Supplement for discussion of ongoing state-level efforts to identify new SEZs.

In characterizing their concerns with the program alternative, some environmental organizations and agencies identified categories of land that they believe should have been excluded from application for development, for example, citizen-nominated wilderness, lands identified in proposed protective legislation, core habitat, wildlife migration corridors, and areas around National Parks. See Section 2.2.2.1 of this Supplement for information on proposed changes to exclusion areas.

Many written comments and individual speakers at the public meetings stated a preference for distributed generation and community-based energy solutions over utility-scale projects on public lands that would require long-distance transmission, adversely affect local communities and quality of life, and potentially result in higher future electricity costs for consumers. Concerns were expressed regarding conversion of public lands to a single, industrial-type use that would preclude other uses by the public. These concerns are not further addressed through this Supplement, but the Draft Solar PEIS did address these issues in Section 2.5.1 and Sections 2.5.4 through 2.5.8.

The primary concern expressed by the solar industry related to the BLM's commitment to continued processing of existing applications. See Section 1.7 of this Supplement for information on how the BLM will process new and pending applications. Comments from the solar industry also did not support the SEZ alternative. They stated that while the proposed SEZs theoretically contain sufficient acreage to accommodate projected levels of development, the identified SEZs might not be located in the right places for meeting market demand or maximizing transmission opportunities. Identification of a variance process to address proposals for development on lands outside of SEZs was requested. Industry comments also expressed concern that the proposed mitigation requirements for SEZs were too onerous. See Section 2.2.2.2.3 of this Supplement for information on incentives being proposed to make development in SEZs more attractive to industry, including transmission-related activities, and Section 2.2.2.3 for discussion of the proposed variance process for applications outside of SEZs.

Not all comments received are being addressed through this Supplement; for example, comments were received proposing specific changes to the adaptive management strategy and design features proposed in the Draft Solar PEIS. These comments will be addressed in the Final Solar PEIS, and any appropriate corresponding changes will be made to that document.

1.3 BLM'S PURPOSE AND NEED

As described in the Draft Solar PEIS, the BLM has identified a need to respond in a more efficient and effective manner to the high interest in siting utility-scale solar energy development on public lands and to ensure consistent application of measures to mitigate the adverse impacts of such development. The BLM is therefore considering replacing certain elements of its existing solar energy policies with a comprehensive Solar Energy Program that would allow the permitting of future solar energy development projects to proceed in a more efficient and standardized manner. While the proposed Solar Energy Program will further the BLM's ability to meet the mandates of Executive Order (E.O.) 13212 (~~–~~Actions to Expedite Energy-Related Projects," *Federal Register*, Volume 66, page 28357, May 22, 2001) and the Energy Policy Act of 2005, it also has been designed to meet the requirements of Secretarial Order 3285A1 (Secretary of the Interior 2010) related to identifying and prioritizing specific locations best suited for utility-scale solar energy development on public lands.

In order to delineate areas best suited for utility-scale solar energy development, through the Draft Solar PEIS the BLM identified and analyzed proposed SEZs to determine their

suitability for solar energy development. Based on further data collection, consultation with land and resource managers, and comment analysis, the BLM has eliminated some proposed SEZs from further analysis and refined the boundaries of other SEZs. These changes are reflected in this Supplement and will be carried forward into the Final Solar PEIS. See Section 2.2.2.2 for additional information about proposed changes to SEZs.

The objectives of BLM's proposed Solar Energy Program remain unchanged and include the following:

- Facilitating near-term utility-scale solar energy development on public lands;
- Minimizing potential negative environmental, social, and economic impacts;
- Providing flexibility to consider a variety of solar energy projects (location, facility size, technology, and so forth);
- Optimizing existing transmission infrastructure and corridors; and
- Standardizing and streamlining the authorization process for utility-scale solar energy development on BLM-administered lands.

The elements of the BLM's proposed Solar Energy Program have been expanded from the Draft Solar PEIS and include the following:

1. Continued processing of pending applications for utility-scale solar energy development;
2. Identification of lands to be excluded from utility-scale solar energy development in the six-state study area;
3. Identification of priority areas (i.e., SEZs) that are well suited for utility-scale production of solar energy in accordance with the requirements of Secretarial Order 3285A1 and the associated authorization procedures for applications in these areas;
4. Establishment of a process to identify new SEZs;
5. Establishment of a process that allows for responsible utility-scale solar energy development outside of SEZs (i.e., variance process);
6. Establishment of mitigation requirements for solar energy development on public lands to ensure the most environmentally responsible development and delivery of solar energy; and
7. Amendment of BLM land use plans in the six-state study area to adopt those elements of the new Solar Energy Program that pertain to planning.

1.4 BLM DECISIONS TO BE MADE

On the basis of the analyses presented in the Solar PEIS, the BLM anticipates making the following land use planning decisions that will establish the foundation for a comprehensive Solar Energy Program. Changes in these land use planning decisions in the future will require the BLM to complete land use plan amendments and associated NEPA analyses.

1. Land use plan amendments that identify exclusion areas for utility-scale solar energy development in the six-state study area;

2. Land use plan amendments that identify areas potentially available for utility-scale solar energy development outside of SEZs in the six-state study area (i.e., variance areas[1]);

3. Land use plan amendments that identify priority areas for solar energy development that are well suited for utility-scale production of solar energy (i.e., SEZs); and

4. Land use plan amendments that establish design features (i.e., mitigation requirements) for solar energy development on public lands to ensure the most environmentally responsible development and delivery of solar energy (some may be SEZ-specific, as necessary).

In addition to the planning-level decisions outlined above, the BLM's Solar Energy Program will include a number of policy components such as the variance process to address right-of-way (ROW) applications for utility-scale solar energy development outside of SEZs and the incentives for projects proposed in SEZs. These components will be part of the ROD for the Solar PEIS; the BLM will issue subsequent Instruction Memoranda to formally establish such policies. The BLM retains the ability to change policies associated with its Solar Energy Program through existing policy-making tools.

On the basis of the analysis in the Final Solar PEIS, the Secretary of the Interior may also decide to withdraw the public lands encompassed by SEZs from potentially conflicting uses through the issuance of a Public Land Order. The required withdrawal studies and analyses are being completed as part of the Solar PEIS (see Section 2.2.2.2.4 of this Supplement for an update). The Secretary of the Interior's final decision on the withdrawal of these lands will be made on the basis of the Final Solar PEIS; however, the Secretary's ROD for any withdrawal decision will likely be made separate from the BLM's ROD for the land use planning decisions analyzed by the Solar PEIS.

[1] A variance area is an area to be avoided that may be available for a solar energy right-of-way (ROW) with special stipulations or considerations; see the *Land Use Planning Handbook* (BLM 2005).

While the Solar PEIS provides analysis of the impacts of constructing, operating, and decommissioning the infrastructure needed to support utility-scale solar energy development, such as roads, transmission lines, and natural gas or water pipelines, the decisions to be made will be applicable only to the siting of utility-scale solar energy generation facilities (Draft Solar PEIS, Section 2.2.2.2). Management decisions for supporting infrastructure would continue to be made in accordance with existing land use plan decisions and current applicable policy. Siting of supporting infrastructure would be analyzed in project-specific environmental reviews.

1.5 SCOPE OF THE ANALYSIS

The scope of this Supplement remains unchanged from the Draft Solar PEIS—it includes analyses of the use of multiple solar energy technologies at utility scale over the next 20 years on lands within six southwestern states: Arizona, California, Colorado, Nevada, New Mexico, and Utah.

The scope of this Supplement is limited to utility-scale solar development, in part, because the Energy Policy Act of 2005 and Secretarial Order 3285A1 (Secretary of the Interior 2010) require that the BLM take steps to facilitate development at that scale. For the purposes of the Solar PEIS and associated decision making, utility-scale solar development is defined as any project capable of generating 20 megawatts (MW) or more. As a result, the BLM's new Solar Energy Program would apply only to projects of this scale; decisions on projects that are less than 20 MW would continue to be made in accordance with existing land use plan decisions, current applicable policy, and individual site-specific NEPA analyses.

Several technologies for the utility-scale capture of solar energy are currently in use and are being refined. Viable utility-scale solar technologies considered likely to be deployed over the next 20 years and analyzed as part of the Solar PEIS include parabolic trough, power tower, dish engine systems, and photovoltaic (PV) systems.

1.5.1 Program Analysis versus SEZ-Specific Analysis

NEPA dictates that federal agencies take a "hard look" at the environmental consequences of a proposed action. The requisite environmental analysis performed by an agency must be commensurate with the action in question. In the case of the Solar PEIS, it is important to make a distinction between the Solar Energy Program elements to be decided upon based on the Solar PEIS, and the additional data collection and analysis being completed for SEZs to inform future project decisions in those priority areas.

As outlined in Section 1.4 above, the BLM expects to make withdrawal- and planning-level decisions through the Solar PEIS, such as land use designations and design features. The program elements adopted via planning-level decisions will provide the basis for future project-specific utility-scale solar energy development decisions. The Solar PEIS appropriately evaluates the potential direct, indirect, and cumulative environmental, social, and economic effects of establishing broad Solar Energy Program elements and strategies across the six-state study area.

Because the proposed program involves environmental effects over a broad geographic and time horizon, the depth and detail of the impact analysis are fairly general, focusing on major impacts in a qualitative manner.

In addition to the programmatic analysis described above, the Solar PEIS also provides in-depth data collection and environmental analysis for proposed SEZs. The primary purpose of this more rigorous analysis is to provide documentation from which the BLM can tier future project authorizations, thereby limiting the required scope and effort of project-specific NEPA analyses. The BLM will complete a site-specific environmental review of all solar energy ROW applications in accordance with NEPA prior to issuing a ROW authorization. All future projects proposed in SEZs will tier to the analysis in the Solar PEIS. The extent of this tiering, however, will vary from project to project, as will the necessary level of NEPA documentation (see Section 2.2.2.2.2 on the SEZ authorization process).

1.6 STATUS OF REASONABLY FORESEEABLE DEVELOPMENT SCENARIO

The reasonably foreseeable development scenario (RFDS) developed for the Draft Solar PEIS to help define the potential magnitude of solar energy development that could occur within the six-state study area over the next 20 years is still considered to be valid to support analyses in this Supplement and the Final Solar PEIS.

As discussed in the Draft Solar PEIS (Section 2.4), the RFDS was calculated on the basis of the requirements for electricity generation from renewable energy resources established in the Renewable Portfolio Standards (RPSs) in each of the six states. To establish an upper bound, it was assumed that 50% of the RPS-based requirement for renewable energy production would be provided from solar energy and that 75% of the solar development would occur on BLM-administered lands within the specific state.

Table 1.6-1 presents the RFDS for each state in terms of projected MWs and estimated acres of land required to support that level of development. As shown, the estimated amount of solar energy generation on BLM-administered lands in the study area over the 20-year study period is about 24,000 MW, with a corresponding dedicated use of about 214,000 acres (866 km^2) of BLM-administered lands.

A number of comments on the Draft Solar PEIS pointed out that the RFDS calculations do not account for the import and export of solar-generated electricity between states and, as a result, the calculations could underestimate potential development in a given state. Specifically, it was pointed out that renewable energy generated in Arizona, Nevada, and even Utah might be exported to California as utilities try to meet the RPS established in that state. In such cases, the total level of development in these states would be greater than that projected by the RFDS. While these are valid considerations, the conditions assumed in the RFDS (i.e., that 50% of the renewable energy development would be from solar and that 75% of it would occur on BLM-administered lands) provide an upper bound on the potential solar development both within a state and on BLM-administered lands that might accommodate additional development for exported electricity.

TABLE 1.6-1 Projected Megawatts of Solar Power Development by 2030 and Corresponding Developed Acreage Estimates for Reasonably Foreseeable Development Scenario[a]

State	Landholding	Estimated MWs under RFDS	Estimated Acres under RFDS[b]
Arizona	BLM	2,424	21,816
	Non-BLM	808	7,272
California	BLM	15,421	138,789
	Non-BLM	5,140	46,260
Colorado	BLM	2,194	19,746
	Non-BLM	731	6,579
Nevada	BLM	1,701	15,309
	Non-BLM	567	5,103
New Mexico	BLM	833	7,497
	Non-BLM	278	2,502
Utah	BLM	1,219	10,971
	Non-BLM	406	3,654
Total	BLM	23,791	214,119
	Non-BLM	7,930	71,370

[a] See Appendix E of the Draft Solar PEIS for details on the methodologies used to calculate the RFDS.

[b] Acreage calculated assuming land use of 9 acres/MW. To convert acres to km^2, multiply by 0.004047.

Table 2.3-1 in this Supplement compares the amount of land needed to support the RFDS projects to the amount of land that would be made available for solar development in each state under the BLM's modified action alternatives. Because the SEZs proposed under the modified alternatives may not make enough land available to meet the RFDS requirements in some states (e.g., Arizona, California, and Colorado), the BLM has initiated efforts to identify new SEZs through ongoing state-based efforts (see Section 2.2.2.2.6 of this Supplement for more information). The BLM also anticipates that it will identify additional SEZs in other states in the near future using the protocol for identifying new SEZs presented in Appendix D of this Supplement. There is also the opportunity to develop projects outside of SEZs in variance areas in accordance with the variance process described in this Supplement (see Section 2.2.2.3.1).

1.7 DEFINITION AND PROCESSING APPROACH FOR NEW, PENDING, AND APPROVED SOLAR APPLICATIONS

Many individuals and organizations commenting on the Draft Solar PEIS wanted to know more about how the BLM intends to deal with solar applications filed before the Solar PEIS ROD. This section responds to those concerns by describing how the BLM will process individual applications. The BLM intends to continue to process all pending applications that meet due diligence and siting requirements under BLM's current policies. All new applications will be subject to the ROD for the Solar PEIS. The approach that the BLM will use for processing new and pending applications is summarized in Table 1.7-1.

1.7.1 New Applications

The BLM will define "new" applications as those applications filed within proposed SEZs[2] after June 30, 2009, and any application filed after the publication of this Supplement to the Draft Solar PEIS. The BLM will continue to accept applications both inside and outside of proposed SEZs after publication of this Supplement. All new applications will be subject to the decisions in the ROD and associated land use plan amendments, including a competitive process for projects in SEZs (see Section 2.2.2.2.1) and the variance process for projects proposed in variance areas (see Section 2.2.2.3).

TABLE 1.7-1 Processing Approach for New and Pending Applications

Application Location	Filing Date	Type	Processing Approach
Inside proposed SEZs	Before June 30, 2009	Pending	Continued processing under existing policies
	After June 30, 2009	New	Subject to Solar PEIS ROD including competitive process
Outside proposed SEZs	Before publication of Supplement	Pending	Continued processing under existing policies
	After publication of Supplement	New	Subject to Solar PEIS ROD including variance process

[2] In its June 30, 2009, *Federal Register* Notice, the BLM announced that applications for solar energy ROWs received *after* June 30, 2009, for lands inside a proposed Solar Energy Study Area (or proposed SEZ as described in the Draft PEIS) would not be processed until the signing of the Solar PEIS ROD and would be subject to the decisions in the ROD. Such projects are considered to be new even if they are no longer in a proposed SEZ per this Supplement.

1.7.2 Pending Applications

The BLM will define "pending" applications as all applications on file with the BLM before publication of this Supplement, including applications for lands within proposed SEZs filed before June 30, 2009.

In an effort to facilitate environmentally responsible solar energy development, the BLM will continue to process appropriately sited projects that have been put forward by qualified, diligent applicants. The BLM will process pending solar applications consistent with its existing regulations and policies (e.g., IM 2011-060 [BLM 2011a] and IM 2011-061 [BLM 2011b]), and with current interagency coordination practices with DOI agencies, such as the U.S. Fish and Wildlife Service (USFWS) and National Park Service (NPS). These applications will be treated as project-specific undertakings under Section 106 of the National Historical Preservation Act (NHPA) and the BLM's National Programmatic Agreement (PA).

The BLM has determined that, in appropriate circumstances, it can rely on the broad discretion it has under FLPMA to deny ROW applications prior to completing the NEPA process if such applications do not meet due diligence requirements and/or environmental criteria. Such decisions must be made with regard for the public interest and be supported by reasoned analysis and an adequate administrative record. Decisions to deny pending applications must be assessed on a case-by-case basis. BLM's denial of an application constitutes a "final agency action" and is therefore subject to administrative appeal to the Interior Board of Land Appeals (IBLA).

The BLM may decide to deny pending solar applications before completion of the Solar PEIS ROD if the BLM has a supportable, rational basis. The following guidelines will be used to inform the BLM's processing of pending applications:

- Pending applications on the DOI's "high priority" list shall continue to be given priority processing as long as the applicant continues to meet the due diligence provisions in IM 2011-060 (BLM 2011a).

- Pending applications that meet the criteria for "High Potential for Conflict" described in IM 2011-061 (BLM 2011b) are likely candidates for denial. High Potential for Conflict describes more complex projects that will require a greater level of consultation, analysis, and mitigation to resolve issues or that may not be feasible to authorize, including:
  - Lands near or adjacent to lands designated by Congress, the President, or the Secretary for the protection of sensitive viewsheds, resources, and values (e.g., units of the National Park System, Fish and Wildlife Service Refuge System, specially designated units of the National Forest System, and the BLM National Landscape Conservation System[3]), which may be adversely affected by development;

[3] National Historic and Scenic Trails are part of the BLM National Landscape Conservation System but, due to their linear nature, were described in IM 2011-061 as areas of "Medium Potential for Conflict."

  - Lands adjacent to Wild, Scenic, and Recreational Rivers and river segments determined eligible or suitable for Wild or Scenic River status, if project development may have significant adverse effects on sensitive viewsheds, resources, and values;
  - Designated critical habitat for federally threatened and endangered species if project development is likely to result in the destruction or adverse modification of that critical habitat;
  - Lands currently designated as Visual Resource Management (VRM) Class I or Class II in BLM land use plans;
  - ROW exclusion areas identified in BLM land use plans; and
  - Lands currently designated as no surface occupancy in BLM land use plans.

- Pending applications on lands proposed as exclusion areas for utility-scale solar energy development in the Final Solar PEIS are likely candidates for denial. Upon issuance of the Solar PEIS ROD, the BLM may deny pending applications to the extent such applications overlap with exclusion areas identified in the ROD for the protection of ecological, cultural, visual, or other specified resource values.

- Pending applications shall be processed in accordance with the due diligence provisions in IM 2011-060:
  - Applications shall be denied if the applicant cannot demonstrate financial and technical capability, for example,
    - International or domestic experience with solar projects on federal or nonfederal lands;
    - Sufficient capitalization to carry out development;
    - Conditional commitments of DOE loan guarantees;
    - Confirmed Power Purchase Agreements (PPAs);
    - Engineering, procurement and construction contracts; and
    - Supply contracts with credible third-party vendors for the manufacture and/or supply of key components for solar project facilities.
  - Applications shall be denied if the applicant cannot meet Plan of Development (POD) due diligence requirements:
    - The POD must be of sufficient detail to provide the basic information necessary to begin the environmental analysis and review process; and
    - Time lines established in IM 2011-060 will apply.

- Pending applications that meet due diligence requirements and have medium or low resource conflicts will be evaluated by the BLM in coordination with other DOI agencies. These evaluations will assist the BLM in identifying issues and developing appropriate strategies to resolve such issues (e.g., alternatives, mitigation, and so forth) and will occur before the BLM initiates the NEPA process.

The BLM, in coordination with other DOI agencies, will continue to identify priority projects. The BLM will apply the due diligence and screening criteria requirements of IM 2011-060 and IM 2011-061 to determine priority projects. Designation as a "priority project" means that the BLM and applicable partner agencies have agreed to prioritize processing and review of the application. Priority projects are subject to all regulatory and statutory requirements, including full NEPA review.

The efforts described above are expected to result in additional approvals and denials over the next several months.

As of August 15, 2011, there were 79 pending first-in-line solar applications: 31 in Arizona, 20 in California, 25 in Nevada, and 3 in New Mexico. A detailed list is included in Appendix A of this Supplement.

1.7.3 Approved Applications

The ROD for the Solar PEIS will recognize all previously approved solar projects. As of August 15, 2011, the BLM had approved 10 utility-scale solar projects on public land and the associated linear ROWs to enable the development of 2 projects on private land. Each approval was based on a site-specific EIS and announced through a *Federal Register* Notice and press release accompanied by a project fact sheet and map. These documents are available at http://www.blm.gov/wo/st/en/prog/energy/renewable_energy/priority_projects.html. A summary of the approved public land applications is provided in Table 1.7-2. Three of the approved public land projects in California will require additional case processing and environmental review to consider post-authorization requests to change technology.

Seven of the approved public land projects are located in the California Desert District planning boundary of the California Desert Conservation Area (CDCA) Plan, the applicable Resource Management Plan (RMP) for these project sites and the surrounding areas. The CDCA Plan requires that all sites associated with power generation or transmission not already identified in that Plan be considered through the BLM's land use plan amendment process. As a result, prior to approval of these seven projects, the BLM had to specifically amend the CDCA Plan to allow each solar project. The approved amendments revise the plan to allow for utility-scale solar energy development on the specified tracts of land. The BLM intends to again amend the CDCA Plan in the ROD for the Solar PEIS to designate SEZs as additional areas appropriate for solar energy generation and related transmission. This will help streamline future project approvals in SEZs in the CDCA planning area. Projects within the CDCA planning area that are subject to the variance process (see Section 2.2.2.3) would still require a plan amendment until further amended by a subsequent planning process (e.g., the DRECP; see Section 2.2.2.2.6).

TABLE 1.7-2 Approved Solar Projects on BLM-Administered Lands as of August 15, 2011

Serial Number	Customer Name (Project Name)	Application Filed	Total BLM Acres[a]	MW	Technology	BLM Field Office
CACA 048649	FIRST SOLAR (Desert Sunlight)	November 7, 2006	4,100	550	PV	Palm Springs–South Coast
CACA 047740	TESSERA SOLAR (Imperial Valley Solar)[b]	January 6, 2005	6,459	709	Dish engine	El Centro
CACA 048668	BRIGHT SOURCE (Ivanpah SEGS)[c]	November 17, 2006	3,501	370	Concentrating solar power (CSP)/tower	Needles
CACA 048811	SOLAR MILLENNIUM/ CHEVRON (Blythe)[d]	February 15, 2007	7,025	1,000	CSP/trough	Palm Springs–South Coast
CACA 048880	NextEra BOULEVARD ASSOCIATES LLC (Genesis)	January 31, 2007	1,950	250	CSP/trough	Palm Springs–South Coast
CACA 049537	TESSERA SOLAR (Calico Solar)[e]	March 14, 2007	4,604	664	Dish engine	Barstow
CACA 049561	CHEVRON ENERGY SOLUTIONS CO (Lucerne Valley)	December 7, 2007	422	45	PV	Barstow
NVN 084359	SOLAR MILLENNIUM (Amargosa Farm Road)	November 11, 2007	4,350	484	CSP/trough	Pahrump
NVN 085077	FIRST SOLAR (Silver State North)	March 21, 2008	618	50	PV	Las Vegas
NVN 086292	SOLAR RESERVE (Crescent Dunes)	November 5, 2008	2,250	110	CSP/tower	Tonopah
Total	10 projects		35,279	4,232		

[a] To convert acres to km^2, multiply by 0.004047.

[b] Acquired by AES Solar; proposed technology change to PV.

[c] Includes CACA 049502, 049503, and 049504.

[d] Proposed technology change for first phase to PV.

[e] Acquired by K Road Solar; proposed technology change to partial PV.

1.8 ONGOING RULEMAKING

1.8.1 Segregation Rule

On April 26, 2011, the BLM published an Interim Temporary Final Rulemaking (ITFR) and a Proposed Rule containing the same language as in the *Federal Register*. The rule is found in added Sections 2091.3-1(e) and 2804.25(e) in Title 43 of the *Code of Federal Regulations* (43 CFR 2091.3-1(e) and 2804.25(e)), which comprise regulations for segregations in general and ROW protection through segregations, respectively. The new segregation rule is intended to promote the orderly administration of public lands. The ITFR allows an authorized officer to close (segregate) public lands from operation of the public land laws. This includes the mining law, but not the mineral leasing or materials sale acts, for a period of up to two years. This segregation may not be extended under the ITFR. By protection of such lands, a solar or wind energy ROW applicant has assurances that the application will not be subject to adverse activities caused by either the filing of mining claims or impacts from other proposed land uses. The BLM is currently analyzing comments received as part of the final rulemaking process.

1.8.2 Competitive Process

As part of this Supplement, the BLM is confirming its intentions to offer lands in SEZs through a competitive process. Comments received on the Draft Solar PEIS expressed concern over how the BLM would implement a new competitive process, and commentors specifically requested that the BLM develop regulations to define a competitive process that would provide opportunity for public comment and input. In response, the BLM has decided to undertake rulemaking to establish a competitive process for offering public lands for solar as well as wind energy development. When established, the rule would supersede some of the authorization policies identified in this Supplement (see Section 2.2.1.1).

Rulemaking will involve publication of an Advanced Notice of Proposed Rulemaking, a Proposed Rule, and a Final Rule and could take up to two years to complete. The BLM is planning to publish an Advanced Notice of Proposed Rulemaking in October 2011 to accompany the release of this Supplement; the BLM intends to have a Proposed Rule available for public comment prior to the release of the Solar PEIS ROD (targeting late spring 2012).

Section 501 of FLPMA authorizes the Secretary of the Interior, with respect to public lands, to grant, issue, or renew ROWs over, upon, under, or through such lands for systems for the generation, transmission, and distribution of electric energy (*United States Code*, Title 43, Section 1761(4) [43 USC 1761(4)]). This authority includes the issuance of ROW lease authorizations for solar energy generation systems. The existing ROW regulations (43 CFR 2804.23(c)) currently provide authority for identifying public lands under competitive bidding procedures, but limit the competitive process to responding to ROW applications. The BLM may use competitive procedures under existing regulations to screen or select applications for lands outside SEZs, where appropriate. The purpose of a competitive process under existing regulations is to determine which application would be processed. Through rulemaking, the

BLM could provide broader authority and a different competitive process for making lands available for solar energy development within SEZs.

The proposed rule could include the following provisions for a competitive process for lands within SEZs:

- **Call for nominations.** A call for nominations could be published in the *Federal Register* to solicit expressions of interest for parcels of land within individual SEZs. A nomination of a specific parcel would require payment of a nomination fee to be determined by the regulations. (Section 504 of FLPMA provides authority to the BLM to establish reasonable filing fees.)

- **Review of nominations.** The BLM would review the nominations to determine parcels of land to offer in individual SEZs. The BLM would complete the work necessary to prepare the selected parcels for the competitive offer.

- **Notice of competitive offer.** A Notice would be published at least 30 days prior to the competitive offer. The Notice would include a legal description of the lands involved, the process for conducting the competitive offer, a minimum bid requirement, and the due diligence requirements for the successful bidder to submit a POD for the lands involved in the competitive offer.

- **Bonus bid competitive process or other competitive procedures.** A variety of competitive bid procedures could be defined by the new regulations. These other competitive procedures could include sealed bids, oral auctions or continuous bidding, two-stage bidding, or multiple factor bidding methods. Bonus bids would be handled as Treasury receipts. The accepted bonus bid would be nonrefundable.

- **Issuance of competitive ROW lease authorization.** A ROW lease authorization (lease) could be issued to the successful bidder. The lease would be a 30-year, fixed-term lease with a fixed rental fee. The holder of the lease would be required to submit a POD and cost-recovery fees within the time frames specified in the lease.

- **Administration of competitive ROW leases.** The leaseholder would submit a POD for authorization prior to the start of any construction. A NEPA review would be required prior to approval of the POD. The BLM would include a requirement in each competitive solar ROW lease that the holder begin construction within the time frames approved in the POD and comply with terms and conditions requiring the holder to maintain all facilities in accordance with the design standards in the approved POD. The BLM would require that a minimum performance bond be provided for all competitive solar ROW leases to ensure compliance with the provisions of the regulations and the terms and conditions of the lease.

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2 BLM ALTERNATIVES

The alternatives being analyzed through this Supplement include the no action alternative, which would continue the BLM's existing policies, and two action alternatives, each of which would have the BLM establish a comprehensive Solar Energy Program to facilitate utility-scale solar energy development on BLM lands. On the basis of further data collection, consultation with cooperating agencies and resource managers, and analysis of comments submitted on the Draft Solar PEIS, modifications have been made to the BLM's action alternatives. Those changes are described and analyzed as part of this Supplement.

The BLM may choose to adopt one of the alternatives or a combination of alternatives from this Supplement; selected alternatives may also vary by geographic region. The BLM's final decisions regarding its Solar Energy Program will be informed by public comment and ongoing consultations.

2.1 NO ACTION ALTERNATIVE

The no action alternative remains unchanged from the Draft Solar PEIS (see Section 2.2.1 of the Draft). The no action alternative continues the issuance of ROW authorizations for utility-scale solar energy development on BLM-administered lands by implementing the requirements of the BLM's existing solar energy policies on a project-by-project basis. Lands available for solar energy development would include those areas currently allowable under existing applicable laws and statutes (approximately 98 million acres [396,600 km^2] in the six-state study area) and in conformance with the approved land use plan(s).

2.2 MODIFIED BLM ACTION ALTERNATIVES

2.2.1 Program Components Common to All Action Alternatives

Under the BLM's proposed Solar Energy Program, both action alternatives would include comprehensive ROW authorization policies, requirements for adaptive management and monitoring, and implementation of specific design features that would mitigate known adverse effects of solar energy development. These elements of the proposed program are described in detail in the following subsections.

2.2.1.1 Right-of-Way Authorization Policies

This section includes a comprehensive update to Section A.2.1.2.4 in Appendix A of the Draft Solar PEIS. Changes in BLM's proposed ROW authorization policies have been made to reflect comments received on the Draft Solar PEIS as well as to ensure consistency with BLM

Instruction Memoranda in existence or released after the publication of the Draft Solar PEIS. Note the BLM has decided to undertake rulemaking to establish a competitive process for offering public lands for solar as well as wind energy development. When established, the rule may supersede some of the authorization policies identified in this Supplement (see Section 1.8.2 of this Supplement for more information). The revised comprehensive list of authorization policies is as follows:

- ***ROW Authorizations.*** Applications for utility-scale solar energy facilities will be authorized ROWs under Title V of FLPMA and 43 CFR Part 2800. Applications submitted to the BLM for utility-scale solar energy development will use Form SF-299, Application for Transportation and Utility Systems and Facilities on Federal Land (available at https://www.blm.gov/FormsCentral/show-form.do?nodeId=1011), consistent with the requirements of 43 CFR Part 2804.

  The Secretary of the Interior, with respect to public lands, is authorized to grant, issue, or renew ROWs over, upon, under, or through such lands for systems for generation, transmission, and distribution of electric energy (43 USC 1761(a)(4)). The term "ROW" as defined by FLPMA includes an easement, lease, permit, or license to occupy, use, or traverse public lands (43 USC 1702(f)). The BLM has prepared a template ROW lease/grant that would be used to authorize utility-scale solar energy development projects (see http://www.blm.gov/wo/st/en/prog/energy/solar_energy.html). Authorizations will include the solar collectors, tower, turbine generator, fossil-fired generator for hybrid systems, thermal storage, access roads, electrical and transmission facilities, and other testing and support facilities.

- ***Competing Applications.*** If the BLM determines that competition exists, BLM has the regulatory authority to use competitive bid procedures (43 CFR 2804.23). Multiple applications for the same lands can provide an indication of the need to consider a competitive process. The purpose of a competitive process under existing regulations is to determine which application would be processed.

- ***Term of ROW***. In accordance with Title V of FLPMA and the BLM's ROW regulations, the term or length of a solar energy ROW authorization is limited to a reasonable term (43 USC 1764(b); 43 CFR 2805.11(b)). The BLM will issue all solar energy ROW authorizations for a term not to exceed 30 years; shorter terms may be justified in some cases. Thirty years provides a reasonable period consistent with the expected needs of a solar energy facility; it also provides for operation periods that are consistent with typical PPAs. The BLM will also include in each solar energy ROW authorization a specific provision allowing for renewal, consistent with the regulations at 43 CFR 2807.22.

- ***Renewal of ROW.*** An application for renewal must be submitted at least 120 days prior to the expiration of the existing authorization. The BLM authorized officer will review the application for renewal to ensure the holder is complying with the terms, conditions, and stipulations of the existing authorization instrument and applicable laws and regulations. If renewed, the ROW authorization shall be subject to the regulations existing at the time of renewal and any other terms and conditions that the authorized officer deems necessary to protect the public interest.

- ***Cost-Recovery Payments.*** Applicants must submit a complete and acceptable application and provide a cost-recovery payment before the BLM will initiate processing of a ROW application for utility-scale solar energy development. It is anticipated that most ROW applications for solar energy development will be Category 6, full cost-recovery applications.

- ***Valid Existing Rights.*** All solar energy ROW authorizations will be issued subject to valid existing rights.

- ***Rental Fees.*** In accordance with the requirements of Section 504(g) of FLPMA and the provisions of 43 CFR Part 2806, the BLM will require payment of annual rent for use of the public lands for utility-scale solar energy development on the basis of a rental schedule. FLPMA does not provide existing or current authorities for the collection of royalties. The BLM will calculate rents on all solar energy ROW authorizations consistent with the provisions of 43 CFR Part 2806. Some holders or facilities may be exempt from rent pursuant to the Rural Electrification Act of 1936 (REA), as amended (43 CFR 2806.14(d)). Electric facilities that are financed or are eligible for REA financing, qualify for a rent exemption under the provisions of the Act.

  The holder of a solar energy ROW authorization must pay an annual rent in conformance with the regulations (43 CFR 2806.10(a)). Consistent with 43 CFR 2806.50, the BLM has developed a schedule to calculate rental fees for solar energy ROW authorizations. This rental schedule includes a base rent for the acreage of public land included within the solar energy ROW authorization and an additional MW capacity fee based on the total authorized MW capacity for the approved solar energy project on the public land administrated by the BLM. The details of BLM's rental policy can be found in Instruction Memorandum No. 2010-141, issued June 10, 2010 (BLM 2010) (see Appendix A.1 in the Draft Solar PEIS).

  The BLM may adjust the rental whenever necessary, to reflect changes in fair market value as determined by the application of sound business management principles, and so far as practicable and feasible, in accordance with comparable commercial practices. The rental provisions of the authorization

may also be modified consistent with the provisions of any regulatory changes or pursuant to the provisions of new or revised statutory authorities.

- ***Due Diligence—Applicant Qualifications.*** The ROW regulations (43 CFR 2804.12(a)(5)) require all solar energy applications to include information on the financial and technical capability of the applicant to construct, operate, maintain and decommission the project. In addition, the BLM will include provisions requiring diligent development in each solar energy ROW authorization. The regulations (43 CFR 2804.26(a)(5)) provide authority to the BLM to deny any application where the applicant cannot demonstrate the technical or financial capability to construct the project or operate the facilities within the ROW.

  The ROW regulations set forth the qualifications that an individual, business or government entity must possess in order to hold a ROW authorization, including the requirement that the potential grantee be technically and financially able to construct, operate, maintain, and terminate the use of the public lands covered by the authorization (43 CFR 2803.10(b) and 2804.12(a)(5)). In carrying out its obligation to limit ROW authorizations to qualified individuals or entities and to prevent such individuals or entities from holding ROW authorizations merely for purposes of speculating, controlling, or hindering development on the public lands, the BLM will focus on ensuring that the applicant meets the qualification requirements in the regulations.

  In ensuring that an applicant meets the regulatory requirement to demonstrate its technical and financial capability to construct, operate, maintain, and terminate the proposed solar energy facility (43 CFR 2803.10(b) and 43 CFR 2804.12(a)(5)), the BLM will consider a variety of factors, including the following. (1) Applicant qualifications can be demonstrated by international or domestic experience with solar or wind energy projects on either federal or nonfederal lands. (2) The applicant should provide information on the availability of sufficient capitalization to carry out development, including the preliminary study phase of the project and the environmental review and clearance process. (3) Applicants in bankruptcy or with other financial difficulties would generally present financial risk and should be required to provide additional information regarding financial capability. Failure to provide such additional information can be the basis for the BLM authorized officer to deny the application pursuant to the regulations (43 CFR 2804.26(a)(5)). Further evidence of financial and technical capability can include conditional commitments of DOE loan guarantees; confirmed PPAs; engineering, procurement and construction (EPC) contracts; and supply contracts with credible third-party vendors for the manufacture and/or supply of key components for the solar energy project facilities.

During the assessment of technical and financial capability, the BLM authorized officer should also inform applicants that such requirements are continuous during the application process, and the BLM may periodically seek confirmation of these requirements. The BLM authorized officer should additionally inform applicants that such technical and financial capability will become a condition of any ROW authorization, and failure to sustain technical and financial capability for the development of an approved project could be grounds for termination of the authorization.

- ***Due Diligence—Plan of Development (POD).*** The BLM requires that a POD be submitted for all solar energy development ROW applications, consistent with the provisions of 43 CFR 2804.25(b). The BLM will not accept a POD that is simply a conceptual plan. The POD must be of sufficient detail to provide the basic information necessary to begin the environmental analysis and review process for a proposed solar or wind energy project on the public lands. It is critically important that due diligence be demonstrated by the applicant in the timely submittal of an acceptable POD to ensure that the BLM processes those applications that are most likely to result in appropriate renewable energy development on the public lands.

  The BLM authorized officer initiates the due diligence process by requesting, in writing, submittal of a complete POD to the BLM for review. The applicant will be requested to provide the POD within 90 days. If the applicant does not respond within 90 days, or if the applicant has responded and the information is not sufficient, the BLM authorized officer will send a second written request with a 60-day response. A final 30-day show cause letter will be provided to the applicant prior to issuing any decision to deny the application for failure to respond pursuant to the regulations (43 CFR 2804.26(a)(6)).

  The BLM may also deny an application if the applicant does not provide in a timely manner additional information requested by the BLM authorized officer to process an application (43 CFR 2804.26(a)(6)) or the processing fees required by 43 CFR 2804.14.

- ***Notification to Livestock Grazing Operators.*** Upon acceptance of a POD that is likely to adversely affect a current livestock grazing operation, the BLM authorized officer will send a certified letter to the permittee/lessee to serve as the 2-year notification of the BLM‘s potential decision to cancel the permit/lease, in whole or in part, and devote the public lands to a public purpose that may preclude livestock grazing, as required by 43 CFR 4110.4-2(b). The intent of the 2-year notification is to provide the grazing permittee/lessee time to make any necessary financial, business, or management adjustments should the permit/lease be cancelled (in whole or in part). The letter will also inform the permittee/lessee of his/her ability to unconditionally waive the 2-year prior notification.

Upon issuance of a ROW authorization that precludes livestock grazing, the BLM authorized officer will issue a separate proposed grazing decision to the grazing permittee/lessee that includes a copy of the ROW authorization. The proposed grazing decision will (1) state that the effective date of the permit/lease cancellation, and issuance of any new permit/lease for any remaining permitted use, will be 2 years from the permittee's/lessee's receipt of the certified letter sent by the BLM authorized officer to the permittee/ lessee as described in the preceding paragraph; (2) address compensation for range improvements (43 CFR 4110.4-2); and (3) address grazing management changes for the new permit/lease, as well as interim grazing adjustments as appropriate. The BLM will send the proposed grazing decision to the affected ROW applicant, grazing permittees/lessees, and any agent and lienholder of record who are affected by the proposed action, terms and conditions, or modifications relating to applications, permits, and agreements by certified mail or personal delivery. Copies of proposed decisions shall also be sent to the interested public (see 43 CFR 4160.1). The proposed grazing decision will become final unless protested.

- ***Performance and Reclamation Bond***. Title V of FLPMA and the ROW regulations authorize the BLM to require a ROW holder to provide a bond to secure the obligations imposed by the ROW authorization (43 USC 1764(i) and 43 CFR 2805.12(g)). The BLM will require a Performance and Reclamation bond for all solar energy projects to ensure compliance with the terms and conditions of the ROW authorization.

  Acceptable bond instruments include cash, cashier's or certified check, certificate or book entry deposits, negotiable U.S. Treasury securities equal in value to the bond amount, surety bonds from the approved list of sureties (U.S. Treasury Circular 570) payable to the BLM, irrevocable letters of credit payable to the BLM issued by financial institutions that have the authority to issue letters of credit and whose operations are regulated and examined by a federal agency, or a policy of insurance that provides the BLM with acceptable rights as a beneficiary and is issued by an insurance carrier that has the authority to issue insurance policies in the applicable jurisdiction and whose insurance operations are regulated and examined by a federal or state agency. The BLM will not accept a corporate guarantee as an acceptable form of bond. If a state regulatory authority requires a bond to cover some portion of environmental liabilities, such as hazardous material damages or releases, reclamation, or other requirements for the project, the BLM must be listed as an additionally named insured on the bond instrument. This inclusion would suffice to cover the BLM's exposure should a holder default in any environmental liability listed in the respective state bond. Each bond instrument will be reviewed by the appropriate Regional or Field Solicitor's Office for the DOI prior to its acceptance by the BLM.

The BLM authorized officer will review all bonds on an annual basis to ensure adequacy of the bond amount. The bond will also be reviewed at the time of any ROW assignment, amendment, or renewal. The BLM authorized officer may increase or decrease the bond amount at any time during the term of the ROW authorization, consistent with the regulations (43 CFR 2805.12(g)).

The BLM authorized officer will identify the total amount of the Performance and Reclamation bond in the decision that supports the issuance of the ROW authorization. The BLM will require the holder to post the portion of the bond associated with the activities to be approved by the Notice to Proceed (Form 2800-15; available at https://www.blm.gov/FormsCentral/show-form.do?nodeId=1666) prior to the issuance of that Notice. For example, if the Notice to Proceed is limited to an initial phase of development, the bond amount required to be posted before issuance of the Notice to Proceed will be limited to that phase. The bond amount required to be posted would increase with the issuance of a Notice to Proceed for future phases of the project.

The Performance and Reclamation bond will consist of three components for purposes of determining its amount. The first component will address environmental liabilities, including hazardous materials liabilities, such as risks associated with hazardous waste and hazardous substances. This component may also account for herbicide use, petroleum-based fluids, and dust control or soil stabilization materials. If a holder uses herbicides extensively, this component of the bond amount may be significant. The second component will address the decommissioning, removal, and proper disposal, as appropriate, of improvements and facilities. All solar projects involve the construction of substantial surface facilities and the bond amount for this component could be substantial. The third component will address reclamation, revegetation, restoration, and soil stabilization. This component will be determined based on the amount of vegetation retained on-site and the potential for flood events and downstream sedimentation from the site that may result in off-site impacts, including Clean Water Act violations or other violations of law. The holder of the ROW authorization can potentially reduce the bond amount for this component by limiting the amount of vegetation removal as part of the project design and limiting the amount of grading required for project construction.

The BLM may also require bond coverage for all expenses tied to cultural resources identification, protection, and mitigation. This may include, but is not limited to, costs associated with ethnographic studies, inventory, testing, geomorphological studies, data recovery, compensatory mitigation programs, curation, monitoring, treatment of damaged sites, and submission of reports. Bonding for cultural resource identification, protection, and mitigation is necessary in the event that a ROW holder disturbs a site where such resources are present but discontinues development before taking the necessary steps to

complete all analysis, documentation, and proper curation of site contents, and to stabilize or reclaim the cultural and historic properties so that they are returned to a secure condition.

Ultimately, the Performance and Reclamation bond will be a single instrument to cover all potential liabilities. The entire bond amount could be used to address a single risk event such as hazardous materials release or groundwater contamination regardless of the fact that in calculating the total bond amount other risks were also considered. If the bond is used to address a particular risk, the holder would then be required to increase the bond amount to compensate for this use. This approach to establishing a bond is preferable to one allowing holders to maintain separate bonds for each contingency. If separate bonds are held, an underestimation of one type of liability may leave the BLM responsible for making up the difference, as the funds associated with one bond may not be applicable for the purposes of another. Requiring a single, larger bond will ensure that the holders are bonded with a surety that has the capacity to underwrite the entire amount associated with the authorization.

The regulations authorize the BLM to require that applicants submit a Decommissioning and Site Reclamation Plan (DSRP) that defines the reclamation, revegetation, restoration, and soil stabilization requirements for the project area as a component of their POD (43 CFR 2804.25(b)). The DSRP shall require expeditious reclamation of construction areas and the revegetation of disturbed areas to reduce invasive weed infestation and erosion and must be approved by the BLM authorized officer prior to the authorization of the ROW. The approved DSRP will be used as the basis for determining the standard for reclamation, revegetation, restoration, and soil stabilization of the project area and, ultimately, in determining the full bond amount.

The BLM has issued policy guidance for determining bonding requirements for 43 Part CFR 3809 mining operations on the public lands (IM 2009-153 [BLM 2009]) that provides detailed information about the process for determining the appropriate financial guarantees for intensive land uses on the public lands. This guidance can also be used to assist in calculating the bond amount for utility-scale solar energy development projects on public lands. The guidance requires that mining operators submit a Reclamation Cost Estimate (RCE) to the BLM authorized officer for review to assist in determining the bond amount. Although the ROW regulations do not specifically require that a holder of a ROW submit a RCE to the BLM, the BLM can require a ROW applicant to submit a POD in accordance with 43 CFR 2804.25(b). Because a RCE is key to determining the bond amount, a figure that is set forth in any decision authorizing a solar energy project on the public lands, BLM policy will be to require all solar energy ROW applicants to submit a RCE as part of the DSRP and the overall POD for a solar energy

project. Attachment 1 to IM 2009-153 provides Guidelines for Reviewing RCEs and can be used as a guideline to assist in reviewing RCEs submitted for solar energy projects.

To assist in the consistent review of RCEs for solar energy projects and the establishment of bonding amounts for individual projects, the BLM will form an internal Solar Energy Bond Review Team to provide support to the BLM state and field offices. The Solar Energy Bond Review Team will consist of one representative each from California, Nevada, and Arizona and a BLM Washington Office ROW Project Manager. This Solar Energy Bond Review Team will assist the BLM state and field offices in the review of RCEs for solar energy projects and provide recommendations to the BLM authorized officer on the Performance and Reclamation bond for a solar energy project.

- ***Notice to Proceed.*** All solar energy ROW authorizations will include a provision that specifies that ground-disturbing activities cannot begin until the BLM authorized officer issues a Notice to Proceed. Each Notice to Proceed will authorize construction or use and occupancy only as therein expressly stated and only for the particular location or use and occupancy therein described (i.e., a construction phase or site location). The holder will not initiate any construction or other surface-disturbing activities on the ROW without such prior written authorization of the BLM authorized officer. The issuance of a BLM Notice to Proceed by the authorized officer could be delayed pending completion of a requirement(s) imposed by another federal and/or state entity (e.g., permit issuance, mitigation compliance, or biological opinion issuance).

- ***Administrative Appeal.*** All final decisions issued by the authorized officer in connection to the authorization of solar energy projects can be appealed under 43 CFR Part 4 and 43 CFR 2801.10. ROW authorizations are issued as full force and effect decisions (43 CFR 2801.10(b)) and will remain effective during any appeal period.

- ***Air Navigation Hazards.*** Upon issuance of a ROW authorization that includes meteorological or power towers or other tall structures that could pose a hazard to air navigation, the BLM will ensure that the locations of such facilities are noted on aerial navigation hazard maps for low-level flight operations that may be undertaken by the BLM and other federal or state agencies for fire operations, wild horse and burro censuses and gathers, wildlife inventories, facility maintenance, or other activities.

- ***Cadastral Survey Policies.*** Prior to approval of any solar energy ROW application that (1) is within 0.25 mi (0.4 km) of a boundary as described in BLM Instruction Memorandum No. 2011-122 (BLM 2011d), (2) does not conform to the Public Land Survey System, (3) can be located only by protraction diagram, or (4) may potentially affect a body of water, the

responsible field office will coordinate with the respective State Office Chief Cadastral Surveyor as required by BLM Instruction Memorandum No. 2011-122 to ensure adequate Cadastral Survey review of Boundary Evidence. The applicant shall be liable to the BLM for the reasonable cost of such review under the ROW application cost-recovery agreement with the BLM.

All authorizations for solar energy development on BLM-administered lands will contain the following stipulation:

> Evidence of the Public Land Survey System (PLSS) and related federal property boundaries will be identified and protected prior to commencement of any ground-disturbing activity. This will be accomplished by contacting BLM Cadastral Survey to coordinate data research, evidence examination and evaluation, and locating, referencing or protecting monuments of the PLSS and related land boundary markers from destruction. In the event of obliteration or disturbance of the federal boundary evidence the responsible party shall immediately report the incident, in writing, to the authorizing official. BLM Cadastral Survey will determine how the marker is to be restored. In rehabilitating or replacing the evidence the responsible party will be instructed to use the services of a Certified Federal Surveyor (CFedS), procurement shall be per qualification based selection, or reimburse the BLM for costs. All surveying activities will conform to the Manual of Surveying Instructions (Manual) and appropriate State laws and regulations. Local surveys will be reviewed by Cadastral Survey before being finalized or filed in the appropriate State or county office. The responsible party shall pay for all survey, investigation, penalties, and administrative costs.

- ***Diligent Development.*** The ROW regulations specify that a ROW authorization conveys to the holder only the rights that the authorization expressly contains (43 CFR 2805.14) and that the holder must comply with all terms and conditions included in the authorization (43 CFR 2805.12). In order to facilitate efficient development of solar energy on the public lands, the BLM will include a requirement in each ROW authorization that the holder begin construction of the initial phase of development within 12 months after issuance of the Notice to Proceed, but no later than 24 months after the effective date of the ROW authorization. Each authorization will also specify that construction must be completed within the time frames in the approved POD, but no later than 24 months after start of construction unless the project has been approved for phased development as described below. A Notice to Proceed will be issued for each phase of development.

  The BLM will not authorize more than three development phases for any solar energy ROW authorization. If an approved POD provides for phased development, the ROW authorization will include provisions specifying that

construction of each phase (following the first) must begin within 3 years of the start of construction of the previous phase.

The BLM authorized officer may suspend or terminate the authorization when the holder fails to comply with the diligent development terms and conditions of the authorization (43 CFR 2807.17). The regulations provide that before suspending or terminating the authorization, the BLM will send the holder a written notice that gives the holder a reasonable opportunity to correct any noncompliance or to start or resume use of the ROW (43 CFR 2807.18). This notice may be satisfied by the BLM sending a Notice of Failure to Ensure Diligent Development.

To address a failure to comply with an authorization's diligent development provisions, the holder must show good cause for any delays in construction, provide the anticipated date of completion of construction and evidence of progress toward the start or resumption of construction, and submit a written request for extension of the time lines in the approved POD. Good cause may be shown, for example, by delays in equipment delivery, legal challenges, and acts of God. This procedure will apply whether a project has multiple development phases or a single phase.

If, following receipt of a Notice of Failure to Ensure Diligent Development, the holder has satisfactorily complied with each of the requirements of the procedure described above, the authorized officer may grant the holder's request for an extension of the time lines in the approved POD. If, following receipt of such Notice, the holder does not satisfactorily comply with each of the requirements of this procedure, the authorized officer may elect to suspend or terminate the ROW authorization pursuant to 43 CFR 2807.17 where such action is justified.

Each ROW authorization for solar energy development will include terms and conditions requiring the holder to maintain all on-site electrical generation equipment and facilities in accordance with the design standards in the approved POD. In addition, the authorization will specify that any idle, improperly functioning, or abandoned equipment or facilities that have been inoperative for any continuous period of 3 months must be repaired, placed into service, or removed from the site within 30 days from receipt of a written Notice of Failure to Ensure Diligent Development, unless the holder is provided an extension of time by the BLM authorized officer. Upon receipt of such Notice from the BLM authorized officer, the holder must repair, place into service, or remove the equipment or facilities described in the Notice in a timely manner. Alternatively, the holder must show good cause for any delays in repairs, use, or removal; estimate when corrective action will be completed; provide evidence of diligent operation of the equipment and/or facilities; and submit a written request for an extension of the 30-day deadline. If the holder satisfies neither approach, the BLM authorized officer may elect to suspend or

terminate the authorization in accordance with 43 CFR 2807.17–2807.19 where such action is justified. In addition, the BLM may use the posted Performance and Reclamation bond to cover the costs for removal of any idle or abandoned equipment and/or facilities.

All solar energy ROW authorizations must include the diligent development provisions as described above in the terms and conditions of the authorization, consistent with the requirements of 43 USC 1765(b) and the ROW regulations at 43 CFR 2801.2.

- ***Operating Standards.*** The authorization holder shall perform all operations in a good and workmanlike manner, consistent with the approved POD, so as to ensure protection of the environment and the health and safety of the public. To ensure compliance with the terms and conditions of the ROW authorization and to ensure that operations are conducted consistent with those terms and conditions, the BLM authorized officer will conduct inspections of such operations and can issue notices of violations. The authorized officer may also order an immediate temporary suspension of operations, orally or in writing, in accordance with 43 CFR 2807.16 to protect public health or safety or the environment.

- ***Access to Records.*** The BLM may require the holder of a solar energy development ROW authorization to provide any pertinent environmental, technical, and financial records, reports, and other information, including PPAs and Interconnection Agreements, related to project construction, operation, maintenance, and decommissioning, including the production and sale of electricity generated from the approved facilities on public land (43 CFR 2805.12(p); 43 USC 1765(b); 43 USC 1764(g); 43 USC 1761(b)). The BLM may use this information for the purpose of monitoring the authorization and for periodic evaluation and adjustment of rental fees or other financial obligations under the authorization.

  Upon the request of the BLM authorized officer, the appropriate records, reports, or information shall be made available for inspection and duplication by such officer. Any information marked confidential or proprietary will be kept confidential to the extent allowed by law. Failure to cooperate with such request, provide data, or grant access to information or records, may, at the discretion of the BLM authorized officer, result in suspension or termination of the ROW authorization. All solar energy ROW authorizations must include such disclosure provisions in the terms and conditions of the authorization in accordance with the regulations (43 CFR 2807.17).

- ***Changes to Terms and Conditions.*** The BLM authorized officer may change the terms and conditions of the authorization as a result of changes in legislation, regulations, or as otherwise necessary to protect public health or safety or the environment in accordance with 43 CFR 2801.15(e).

- ***Upgrades or Changes to Facility Design or Operation***. Operators of solar power facilities on BLM-administered lands shall coordinate with the BLM and other appropriate federal, state, and local agencies regarding any planned upgrades or changes to the solar facility design or operation. Proposed changes of this nature may require additional environmental analysis and/or revision of the POD.

- ***10-Year Review.*** The solar ROW authorization, shall, at a minimum, be reviewed by the BLM authorized officer at the end of the 10th year and at regular intervals thereafter not to exceed 10 years.

- ***Transfers or Assignments Require BLM Approval.*** The ROW authorization may be assigned (i.e., transfer of interest) consistent with the provisions of the regulations (43 CFR 2807.21(b)). However, all assignments shall be approved by the BLM authorized officer, and the qualifications of all assignees must comply with 43 CFR 2803.10 and the due diligence requirements of the regulations (43 CFR2807.21(c)(1) and 43 CFR 2807.21(d)). The assignment shall not interfere with the BLM's enforcement of the terms and conditions of the authorization or management of the associated public lands. Transfers other than assignments must be approved by the BLM and may result in requirements for submittal of a new application or a Notice of Termination.

2.2.1.2 Adaptive Management and Monitoring

As described in the Draft Solar PEIS (Appendix A, Section A.2.1.1 of that document), the BLM (recognizing that data regarding the actual impacts of solar energy development on various resources are still limited) will develop and incorporate into its Solar Energy Program an adaptive management and monitoring plan to ensure that data and lessons learned about the impacts of solar energy projects will be collected, reviewed, and, as appropriate, incorporated into the BLM's Solar Energy Program in the future. Changes to the BLM's Solar Energy Program resulting from adaptive management and monitoring (e.g., modifications to exclusion areas) will be subject to appropriate land use planning, environmental review, and/or policy development.

Development of an adaptive management and monitoring plan will be coordinated with potentially affected natural resource management agencies. The plan will identify how the impacts of BLM's Solar Energy Program will be evaluated, types of monitoring that would be responsive to the data needs for program evaluation, and science-based thresholds for modification to policy or individual project management based upon monitoring results; and describe the process by which changes will be incorporated into the Solar Energy Program, including revisions to policies and design features. Sources of information to be considered in the context of adaptive management include data from specific project evaluations (for which monitoring would be required) as well as from regional long-term monitoring programs.

The BLM, in collaboration with the Agricultural Research Service and the U.S. Geological Survey, has developed a national monitoring strategy which provides the foundation for an adaptive management and monitoring plan for the BLM's Solar Energy Program. The strategy incorporates common indicators; standardized monitoring protocols; a Before-After Control-Impact sample design using paired ecological sites; remote sensed data to map abundance, extent, and disturbance; and a data management plan that addresses data quality, editing and replication, seamless data sets, and data availability. A plan to implement this monitoring strategy and the data analysis tools necessary for threshold analysis will be presented in the Final Solar PEIS. Individual projects will be required to incorporate the monitoring plan, developer assurances to implement the plan, adaptive management thresholds, and additional project-specific monitoring requirements to be identified on an individual project basis.

2.2.1.3 Design Features

In Appendix A, Section A.2.2 of the Draft Solar PEIS, the BLM proposed design features that would be required for all utility-scale solar energy applications submitted to the BLM for consideration. Design features are mitigation requirements that have been incorporated into the proposed action or alternatives to avoid or reduce adverse impacts. The proposed programmatic design features of the BLM's Solar Energy Program would apply to all utility-scale solar energy ROWs on BLM-administered lands under both modified action alternatives.

The BLM is evaluating all comments received on the Draft Solar PEIS regarding the proposed programmatic design features. A final proposed list of programmatic design features will be presented in the Final Solar PEIS.

2.2.2 Modified Solar Energy Development Program Alternative (BLM Preferred Alternative)

In an effort to better meet the objectives established for BLM's Solar Energy Program, as well as address comments and concerns raised by the public, stakeholders, and cooperating agencies through the review of the Draft Solar PEIS, the BLM has modified its solar energy development program alternative. Under the modified solar energy development program alternative (referred to as the "modified program alternative"), the BLM proposes categories of lands to be excluded from utility-scale solar energy development and identifies specific locations well suited for utility-scale production of solar energy (i.e., SEZs) where the BLM would prioritize development. The modified program alternative emphasizes and incentivizes development within SEZs and proposes a collaborative process to identify additional SEZs. In order to accommodate the flexibility described in the BLM's program objectives, the modified program alternative allows for utility-scale solar development in variance areas outside of SEZs in accordance with the proposed variance process. The modified program alternative also establishes authorization policies and procedures for utility-scale solar energy development on BLM-administered lands.

2.2.2.1 Proposed Right-of-Way Exclusion Areas

Under the modified program alternative, the BLM proposes to exclude specific categories of land that are known or believed to be unsuitable for utility-scale solar development. Right-of way exclusion areas are defined as areas which are not available for location of ROWs under any conditions (BLM Land Use Planning Handbook, H-1601-1 [BLM 2005]). On the basis of input received on the Draft Solar PEIS, the list of proposed exclusions has been modified, and state specific exclusions have been incorporated as appropriate (see Table 2.2-1). The BLM continues to work with cooperating agencies to refine the proposed exclusions for specific resources such as sage-grouse and desert tortoise. The BLM also expects that comments received on this Supplement will lead to further adjustments in the list of exclusions. A final proposal for exclusions will be presented in the Final Solar PEIS.

2.2.2.2 Proposed Solar Energy Zones

An SEZ is defined by the BLM as an area within which the BLM will prioritize and facilitate utility-scale production of solar energy and associated transmission infrastructure development. SEZs should be relatively large areas that provide highly suitable locations for utility-scale solar development: locations where solar development is economically and technically feasible, where there is good potential for connecting new electricity-generating plants to the transmission distribution system, and where there is generally low resource conflict.

ROWs for utility-scale solar energy development in SEZs would be given priority over all other ROWs. The BLM may decide to authorize ROWs for other uses that are found to be compatible with utility-scale solar energy development such as shared access roads and transmission lines. The identification of an area as an SEZ will not affect previously authorized ROWs, whether or not construction has been initiated on those ROWs. The BLM will consider the processing of pending ROW applications in identified SEZs on a case-by-case basis.

In a continued effort to find the areas best suited for utility-scale production of solar energy (per Secretarial Order 3285A1 [Secretary of the Interior 2010]), the BLM has modified the list of SEZs being carried forward for consideration in the Solar PEIS. Some of the SEZs analyzed in the Draft Solar PEIS were found to have substantial resource conflicts that make them inappropriate locations to prioritize utility-scale solar energy development. The BLM has decided to drop some SEZs entirely from further consideration based on the comments received on the Draft Solar PEIS and additional data collection that has taken place since the Draft Solar PEIS. The BLM has also decided to adjust the boundaries of some SEZs that will be carried forward in the Solar PEIS.

Specifically, the BLM has decided to drop the following proposed SEZs: Bullard Wash in Arizona, Iron Mountain and Pisgah in California, Delamar Valley and East Mormon Mountain in Nevada, and Mason Draw and Red Sands in New Mexico. In addition, the areas of the following SEZs have been substantially reduced: Riverside East in California; De Tilla Gulch, Fourmile East, and Los Mogotes East in Colorado; Amargosa Valley, Dry Lake, and Dry Lake Valley North in Nevada; and Afton in New Mexico. The overall result of these changes has been to

TABLE 2.2-1 Revised Areas for Exclusion under the BLM's Modified Solar Energy Development Program Alternative[a]

1. Lands with slopes greater than 5%.
2. Lands with solar insolation levels less than 6.5 kWh/m^2/day.
3. All Areas of Critical Environmental Concern (ACECs), including Desert Wildlife Management Areas (DWMAs) in the California Desert District.
4. All critical habitat areas (designated and proposed) for listed species under the Endangered Species Act of 1973 (as amended).
5. All areas where the applicable land use plan designates no surface occupancy (NSO).
6. All areas where there is an applicable land use plan decision to protect lands with wilderness characteristics.
7. Developed recreational facilities, special-use permit recreation sites (e.g., ski resorts and camps), and all Special Recreation Management Areas (SRMAs), **except for those in the State of Nevada and a portion of the Yuma East SRMA in Arizona.**[b]
8. All areas where solar energy development proposals are not demonstrated to be consistent with the land use management prescriptions for or where the BLM has made a commitment to take certain actions with respect to sensitive species habitat, including but not limited to sage grouse core areas, nesting habitat, and winter habitat; Mohave ground squirrel habitat; flat-tailed horned lizard habitat; and fringe-toed lizard habitat. **Greater sage-grouse habitat as identified by the BLM is excluded in California, Nevada, and Utah, and Gunnison's sage-grouse habitat is excluded in Utah.**[c]
9. All ROW exclusion areas identified in applicable plans other than those specific to utility-scale solar energy development.
10. All ROW avoidance areas identified in applicable plans other than those specific to utility-scale solar energy development.
11. All areas where the land use plan designates seasonal restrictions.
12. All Desert Tortoise translocation sites identified in applicable land use plans.
13. Big Game Migratory Corridors identified in applicable land use plans.
14. Big Game Winter Ranges identified in applicable land use plans.
15. Research Natural Areas.
16. Lands categorized as Visual Resource Management (VRM) Class I or II (and, in Utah, Class III[d]).
17. National Recreation Trails and National Back Country Byways
18. National Historic and Scenic Trails, including a corridor of 0.25 mi (0.4 km) from the centerline of the trail, except where a corridor of a different width has been established.

TABLE 2.2-1 (Cont.)

19. National Historic and Natural Landmarks.

20. Within the boundary of properties listed in the *National Register of Historic Places* and additional lands outside the designated boundaries to the extent necessary to protect values where the setting and integrity is critical to their designation or eligibility.

21. Areas with important cultural and archaeological resources, such as traditional cultural properties and Native American sacred sites, as identified through consultation and recognized by the BLM.

22. Wild, Scenic, and Recreational Rivers, including a corridor of 0.25 mi (0.4 km) from the ordinary high-water mark on both sides of the river, except where a corridor of a different width has been established.

23. Segments of rivers determined to be eligible or suitable for Wild or Scenic River status, including a corridor of 0.25 mi (0.4 km) from the ordinary high-water mark on either side of the river.

24. Old Growth Forest.

25. Lands within a solar energy development application found to be inappropriate for solar energy development through an environmental review process that occurred prior to finalization of the Draft Solar PEIS.[e]

26. **Lands previously proposed for inclusion in SEZs that were determined to be inappropriate for development through the NEPA process (i.e., the previously-proposed Iron Mountain SEZ area; parts of the Pisgah and Riverside East SEZs in California; parts of the De Tilla Gulch, Fourmile East, and Los Mogotes East SEZs in Colorado; and parts of the Amargosa Valley SEZ in Nevada).**

27. **Lands within the proposed Mojave Trails National Monument in California.[f]**

28. **BLM-administered lands in California proposed for transfer to the National Park Service with the concurrence of the BLM.[g]**

29. **Individual additional areas identified by BLM State or field offices as requiring exclusion due to ecological or cultural concerns.**

[a] Exclusion changes from those presented in the Draft Solar PEIS are shown in bold.

[b] In Nevada, many designated SRMAs are located on semi-degraded lands that might be appropriate for solar development. Decisions on solar ROW applications within Nevada SRMAs will be made on a case-by-case basis. A portion of the Yuma East SRMA was identified as a variance area rather than as an exclusion area based on its designation as VRM Class III and as a rural developed recreation setting, both of which allow for modifications to the natural environment.

Footnotes continued on next page.

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TABLE 2.2-1 (Cont.)

[c] In April 2010, the USFWS published its listing for the greater sage-grouse as "Warranted but Precluded." Inadequacy of regulatory mechanisms was identified as a major threat in the USFWS finding on the petition to list the greater sage-grouse. The USFWS has identified the principal regulatory mechanism for the BLM as conservation measures in RMPs. On the basis of the identified threats to the greater sage-grouse and the USFWS's time line for making a listing decision on this species, the BLM has initiated action to incorporate explicit objectives and adequate conservation measures into RMPs (including PEISs and project EISs) within the next 3 years in order to conserve greater sage-grouse and avoid a potential listing under the Endangered Species Act. To meet the objectives of BLM's sage-grouse conservation policy, the Solar PEIS has excluded specifically identified sage-grouse habitat (currently occupied, brooding, and winter habitat) located on BLM public lands in Nevada and Utah.

[d] In Utah, VRM Class III lands have also been removed due to the high sensitivity and location proximity to Zion, Bryce, Capital Reef, Arches, and Canyonlands National Parks, and to significant Cultural Resource Special Management Areas (in southeast Utah).

[e] For example, lands considered non-developable in the environmental review for the Ivanpah Solar Electric Generating System, Imperial Valley Solar Project, Calico Solar Project, Genesis Ford Dry Lake Solar Project, Blythe Solar Project, and Desert Sunlight Solar Project.

[f] As described in Senate Bill 138, California Desert Protection Act of 2011, introduced in the 112th Congress.

[g] Three specific geographic areas described as (1) the narrow strip of BLM-administered lands between Fort Irwin and Death Valley National Park, (2) an area of public lands on the northeastern side of the Mojave National Preserve adjacent to the California and Nevada border, and (3) an area along the northern boundary of Joshua Tree National Park.

reduce the total acreage potentially available for development in proposed SEZs from about 677,000 acres (2,740 km^2) to about 285,000 acres (1,153 km^2). Appendix B of this Supplement contains the BLM's rationale for dropping SEZs from further consideration. Appendix C contains the rationale for adjusting the boundaries of other SEZs and describes additional non-development areas within some of the SEZs. These appendices also include descriptions of the comments received for individual SEZs.

The Draft Solar PEIS described data available for the proposed SEZs and provided environmental analysis based on those data. The primary purpose of the SEZ-specific analyses provided in the Draft Solar PEIS was to provide documentation from which the BLM can tier future project authorizations, thereby limiting the required scope and effort of project-specific NEPA analyses. As requested by commentors on the Draft Solar PEIS, the BLM is committed to collecting additional SEZ-specific resource data and conducting additional analysis in order to more effectively facilitate future development in SEZs. The BLM has developed action plans for each of the SEZs that it has decided to carry forward in the Solar PEIS. These action plans are presented in Appendix C of this Supplement. Action plans describe data gaps for individual SEZs and propose data sources and methods for the collection of additional data. The BLM encourages input from the public regarding these action plans and appropriate data sources and methods. The BLM will prioritize the collection of additional data and analysis in those SEZs that are most likely to be developed in the near-future. Note that additional data and analysis will help facilitate development in SEZs but is not required to identify an area as an SEZ as part of the BLM's Solar Energy Program.

The BLM proposed SEZ-specific design features as part of the Draft Solar PEIS, in addition to the general Solar Energy Program design features applicable for all projects (see Appendix A, Section A.2.2 of the Draft Solar PEIS). SEZ-specific design features are mitigation measures that would be required of applications in SEZs to avoid or reduce potential adverse impacts. The BLM will continue to refine the list of SEZ-specific design features based on comments received on the Draft Solar PEIS, ongoing coordination with cooperating agencies, additional data collection described in SEZ action plans, and comments received on this Supplement. A final proposal for SEZ-specific design features will be presented in the Final Solar PEIS.

The processes and policies applicable to SEZs presented in the following sections replace components of Appendix A in the Draft Solar PEIS and incorporate applicable elements of BLM Instruction Memoranda in existence or released after the publication of the Draft Solar PEIS.

2.2.2.2.1 Authorization Process for Projects in SEZs

As part of this Supplement, the BLM is confirming its intentions to offer lands in SEZs through a competitive process. The BLM has decided to undertake rulemaking to establish a competitive process for offering public lands for solar and wind development, as described previously in Section 1.8.2.

The Advanced Notice of Proposed Rulemaking is expected to be published in October 2011 to accompany the release of the Supplement; the BLM intends to have a Proposed Rule available for public comment prior to the release of the Solar PEIS ROD (targeting late spring 2012). All applications for solar energy ROWs received after June 30, 2009, for lands inside the SEZs would be subject to the decisions in the Solar PEIS ROD. The BLM may process applications in SEZs prior to completion of the rulemaking process under its existing policies and authorities. In those cases where multiple applications have been filed on the same SEZ lands, the BLM will apply competitive procedures per 43 CFR 2804.23.

2.2.2.2.2 Environmental Review for Projects in SEZs

Utility-scale solar energy development projects proposed in SEZs will be required to comply with NEPA and other applicable laws, including, but not limited to the Endangered Species Act (ESA) and the NHPA, and applicable regulations and policies. The BLM has taken a number of important steps through the Solar PEIS to facilitate future development in SEZs in a streamlined and standardized manner. For projects proposed in SEZs, the BLM expects to comply with applicable laws, regulations, and policies in the manner described below. Projects proposed in SEZs identified and analyzed through state or local land use planning efforts (see Section 2.2.2.2.6 of this Supplement) would receive the same treatment as SEZs identified through the Solar PEIS.

The Secretary, Deputy Secretary, or Assistant Secretary will approve all decisions to authorize ROWs for utility-scale solar energy development in SEZs; the BLM authorized officer

will issue ROWs consistent with the Secretary's, Deputy Secretary's, or Assistant Secretary's decision. Projects in SEZs will therefore not be subject to administrative appeals to the IBLA.

Land Use Plan Conformance

Through the ROD for the Solar PEIS, the BLM will amend land use plans in the six-state study area to adopt those elements of the new Solar Energy Program that pertain to planning. No additional land use plan amendments are expected to be required to approve projects in identified SEZs.

NEPA

The BLM must complete a site-specific environmental review of all solar energy ROW applications in SEZs in accordance with NEPA prior to issuing a ROW authorization. As part of the Solar PEIS, the BLM is conducting a thorough environmental review of the proposed SEZs so that future reviews of applications within SEZs can tier to that NEPA analysis, thereby limiting the required scope and effort of additional project-specific NEPA analyses. Tiering is defined as using the coverage of general matters in broader NEPA documents in subsequent, narrower NEPA documents (40 CFR 1508.28, 40 CFR 1502.20). This allows the tiered NEPA document to concentrate solely on the issues not already addressed.

All future projects proposed in SEZs will tier to the analysis in the Solar PEIS. The extent of this tiering, however, will vary from project to project, as will the necessary level of NEPA documentation. While the SEZ analysis in the Solar PEIS analyzes the likely environmental effects of utility-scale solar development and identifies required SEZ-specific design features to address many resource conflicts, further evaluation will be required for future projects based on the actual location, technology, POD, and so forth.

The BLM authorized officer must determine whether potential environmental impacts associated with proposed projects are within the scope of analysis considered in the Solar PEIS for a given SEZ. If not, the authorized officer must determine the potential significance of any impacts outside the scope of the Solar PEIS and complete appropriate NEPA analysis. For example, if the water impacts associated with a proposed project were not covered by the SEZ analysis in the Solar PEIS and those water impacts are expected to be significant, a tiered EIS would be appropriate (if the impacts did not rise to the level of significance then a tiered environmental assessment [EA] would be appropriate). No matter the level of NEPA documentation, tiered analyses for projects in SEZs are expected to be narrowly focused on those issues not already adequately analyzed in the Solar PEIS. Field offices are instructed to incorporate by reference the relevant portions of the Solar PEIS to which project-specific NEPA documents will be tiered.

The level of NEPA documentation to be required for individual solar projects proposed in SEZs will be determined by the BLM authorized officer. All projects in SEZs that the authorized officer determines will require an EIS level of analysis must be submitted through the

State Director to the BLM Washington Office for the Director's concurrence prior to the issuance of a Notice of Intent (NOI). This will help ensure consistent implementation of the BLM's solar program after the Solar PEIS is completed.

An EA prepared in support of an individual action can tier to a programmatic EIS. An EA can be prepared for an action with significant effects, whether direct, indirect or cumulative, if the EA tiers to a broader EIS that fully analyzed those significant effects. Tiering to the programmatic EIS would allow the preparation of an EA and Finding of No Significant Impact (FONSI) for the individual action, so long as the remaining effects of the individual action are not significant. The finding of no significant impact in these circumstances may also be called a "Finding of No New Significant Impact" (43 CFR 46.140(c)). However if there are new circumstances or information that would result in significant effects of an individual action not considered in the programmatic EIS, tiering to the EIS cannot provide the necessary analysis to support a FONSI for the individual action. In these cases, an EIS would need to be prepared that tiers, to the extent practicable, to the programmatic EIS (BLM NEPA Handbook H-1790-1 [BLM 2008] Section 5.2.2; 43 CFR 46.140(c)).

Public Involvement

Through the Solar PEIS, extensive public involvement specific to solar energy development in SEZs has occurred. On June 30, 2009, the Agencies announced the availability of maps that identified 24 tracts of BLM-administered land for in-depth study for solar development. The BLM issued a *Federal Register* Notice of Availability to inform the public of the availability of the maps (74 FR 31307). Through public scoping (June 30–September 14, 2009), the BLM solicited public comments for consideration in identifying environmental issues, existing resource data, and industry interest with respect to the proposed SEZs. In addition, public comments were solicited on the SEZ analysis presented in the Draft Solar PEIS from December 17, 2010, to May 2, 2011, and as part of 14 public meetings held in February and March 2011. The BLM and applicants will use this input to inform future development in SEZs. Public involvement for projects in SEZs must meet the requirements of NEPA.

Endangered Species Act

The BLM will complete ESA consultation on the Solar PEIS with the USFWS under Sections 7(a)(1) and 7(a)(2) of the ESA. The BLM, in consultation with the USFWS, will complete a conservation review under Section 7(a)(1) of the ESA of the overall solar program, including the amendment of 89 land use plans and associated conservation measures. This consultation on the overarching program will provide guidance for subsequent solar projects by ensuring that the appropriate conservation measures for listed species are incorporated into project-level actions. The BLM will also consult with the USFWS on the identification of specific SEZs under Section 7(a)(2) of the ESA. A Biological Assessment will include appropriate mitigation, minimization, and avoidance measures intended to address any effects on listed (endangered and/or threatened) species and designated critical habitat. Further

Section 7(a)(2) consultation will occur as necessary at the level of individual projects and will benefit from preceding program- and SEZ-level consultation.

National Historic Preservation Act

The BLM has taken numerous actions to comply with requirements of the NHPA in relation to the Solar PEIS. The BLM consulted with Indian Tribes, the State Historic Preservation Offices (SHPOs) from the six states, the Advisory Council on Historic Preservation (ACHP), and the National Trust for Historic Preservation (NTHP). A Solar PA among the BLM, the six SHPOs, and the ACHP, expected to be executed prior to signing of the Solar PEIS ROD, will define steps the BLM will follow to take into account the effects of the BLM's Solar Energy Program on historic properties under Section 106 of the NHPA.

The first draft of the Solar PA was sent to all Tribes for their input in February 2011. A revised draft Solar PA will again be sent to all Tribes requesting their comments in the fall of 2011. Tribes will be invited to sign the agreement as Concurring Parties and will play an active role in its execution.

A tiered approach to the identification and consideration of effects on historic properties is being followed. Existing site record and surveyed space geographic information system (GIS) data bases were utilized to identify potential areas of conflict and define SEZ boundaries. The BLM plans to award a Class II sample survey contract in the fall of 2011 to provide a minimum SEZ survey coverage of 5% within Arizona, California, and Nevada. Results are expected to be available before the ROD is signed and will guide future development toward areas with the fewest conflicts with historic resources.

For future project-specific solar applications, the BLM will meet with project proponents and define what levels of additional survey will be required prior to submission of the completed application package. The terms and conditions of the ROW authorization will require that the project POD include documentation of a completed BLM-approved cultural resources mitigation program before ground disturbance and construction begins.

Tribal Consultation

As part of the Solar PEIS process, the BLM has consulted and engaged with Tribes through various means in order to meet the agency's affirmative responsibilities under the NHPA, NEPA, E.O. 13007 (~~–~~Indian Sacred Sites," *Federal Register,* Volume 61, page 26771, May 24, 1996), the American Indian Religious Freedom Information Act, and other statutes. Beginning in 2008 and continuing through the Final PEIS, the BLM has written to Tribes, provided complete documentation, maps, and current information, and requested government-to-government consultation. Tribes were invited to and participated in public meetings regarding the Draft Solar PEIS. Tribal comments regarding the Draft Solar PEIS affected decisions to drop certain SEZs and to reduce and reconfigure the boundaries of those carried forward.

The BLM contracted with SWCA Environmental Consultants to produce an ethnographic overview of six Tribes within the Great Basin region with cultural and historic ties to SEZs in Nevada and Utah. Detailed interviews with Tribal members and an ethnographic overview have identified traditional cultural properties, significant ethnobotanical resources, visual resource concerns, and Tribal perspectives on direct and indirect effects of solar development on Tribal interests. These ethnographic overviews are available through the Solar PEIS project Web site (solareis.anl.gov). Summaries of the findings available at the time of publication of this Supplement are included in SEZ-specific action plans (Appendix C of this Supplement).

Now that the draft results from the ethnographic overviews have become available, the BLM will contact all other Tribes with cultural and/or historical ties to the SEZs and lands available for development to explore if they share similar concerns or issues to those revealed in the study. Field offices in California and Nevada will consult with those Tribes who provided written comments on the Draft Solar PEIS to explain how their concerns will be taken into account and how Tribal consultation will continue under project-specific applications. A written explanation for how the BLM utilized Tribal input in determining Final Solar PEIS decisions will be mailed to all Tribes with the signing of the ROD.

The BLM will invite Tribes to participate in site-specific proposals within SEZs. On the basis of information and discussions arising from such meetings, the BLM will determine whether there is a need for new ethnographic research to provide sufficient information to adequately consider the effects of solar development on issues and resources of concern to Tribes. BLM field office cultural staff, including specialists assigned to Renewable Energy Coordination Offices where present, in consultation with their Deputy Preservation Officer, shall recommend to responsible BLM line officers whether new ethnographic data are required for a given solar application. Should new ethnographic research, studies, or interviews be judged necessary, the BLM cultural staff, in consultation with Tribal officials, will recommend to BLM line officers the appropriate scope of the study, provisions for safeguarding data confidentiality, and programs of mitigation.

2.2.2.2.3 Incentives for Projects in SEZs

In addition to the work already underway in SEZs (as described above), the BLM is proposing to undertake a variety of additional activities that will help steer future utility-scale solar energy development to the SEZs.

Facilitate Faster and Easier Permitting in SEZs

- The BLM will adhere internally to strict schedules for the completion of environmental reviews for applications in SEZs, with a target for completion of 12 to 18 months. Achieving a 12- to 18-month processing time line will require timely information from applicants.

- The DOI will undertake interagency coordination to expedite service and provide priority processing to projects in SEZs, provide a single point of contact for all DOI agencies responsible for coordinating environmental reviews and consultations, ensure timely performance of agencies, and facilitate stakeholder reviews.

- The BLM will maintain its Renewable Energy Coordination Offices in California, Nevada, and Arizona, and will maintain Renewable Energy Coordination Teams in Colorado, New Mexico, and Utah as long as needed to assist with efficient permitting of projects in SEZs. In addition, the BLM established a new National Renewable Energy Coordination Office on October 1, 2011.

- The BLM may, through rulemaking, establish a competitive process that results in the immediate issuance of a ROW lease authorization to the successful bidder.

Improve and Facilitate Mitigation

- Regional mitigation plans will be developed that are comprised of goals and objectives applicable to individual SEZs that both simplify and improve the mitigation process for future projects. Regional mitigation plans will address mitigation for resources such as biological resources, ecological resources, cultural resources, scenic resources, and socioeconomic factors, as appropriate. Regional mitigation plans can increase permit efficiencies and financial predictability for developers. Regional mitigation plans can also enhance the ability of state and federal agencies to invest in larger-scale conservation efforts that benefit sensitive species through higher-quality habitat, improved connectivity between habitat areas, and better long-term protection.

  The in-depth data collection and analyses proposed for SEZs will inform BLM‘s development of regional mitigation plans. Each regional mitigation plan will consider the cumulative impacts of development within an SEZ as well as ongoing conservation planning priorities (e.g., recovery plans for federal or state ESA-listed species, BLM RMPs, and conservation priorities developed as part of efforts such as the California Desert Renewable Energy Conservation Plan). The BLM will work with appropriate federal, state, and local agencies and Tribes to develop initial regional mitigation plans that will be presented in the Final Solar PEIS. These initial plans will be subject to continued review and adjustment by the BLM and its partners to ensure conservation goals and objectives are met.

  To the extent that public lands are used to mitigate for the impacts of solar development whether in or out of the SEZs, the BLM will develop strategies

to ensure that any mitigation lands are protected to provide enduring conservation benefits. As part of its site-specific environmental review for future projects, the BLM will evaluate the impacts of any mitigation measures it has applied.

- Developers will be allowed to mitigate biological impacts through funding conservation priorities that are identified in a regional mitigation plan.

Facilitate the Permitting of Needed Transmission to SEZs

- The Final Solar PEIS will include a more detailed evaluation of the transmission needs and impacts for anticipated solar development within the SEZs, which will not only facilitate the permitting of projects, but also will facilitate transmission planning for SEZs (details on the planned additional transmission analyses for SEZs to be included in the Final Solar PEIS are given in Appendix C, Section C.7.1 of this Supplement).

- The BLM will offer incentives to developers willing to build transmission to SEZs (e.g., facilitated permitting of needed transmission and prioritization of key transmission projects).

- The BLM will commit staff from BLM's Renewable Energy Coordination Offices and Teams to engage in ongoing and comprehensive transmission planning efforts to ensure the recognition of SEZs as a priority in transmission development. Transmission planning efforts and BLM involvement will be coordinated through the BLM's National Renewable Energy Coordination Office.

- The BLM will seek to establish cooperative agreements, Memoranda of Understanding and/or Memoranda of Agreement with states, Tribes, and other federal agencies to facilitate state permitting of needed transmission to support SEZ development.

- The lead agencies for the Solar PEIS (BLM and DOE) will seek to have the proposed SEZs reviewed as a case study by the Transmission Expansion Planning Policy Committee (TEPPC) of the Western Electricity Coordinating Council (WECC). The TEPPC analysis process is an existing, formal, biennial process used by WECC to assess system impacts across the interconnection when adding resources and/or transmission. It analyzes system congestion and system performance under reliable system operating criteria. This analysis is expected to provide substantial benefits for projects within proposed SEZs.

Encourage Solar Development on Appropriate Nonfederal Lands

- The DOI will encourage development of renewable energy on appropriate nonfederal lands. For projects proposed jointly on SEZ lands and adjacent private, state, Tribal, or U.S. Department of Defense (DoD) withdrawn lands, DOI's permitting incentives as described for SEZs would apply to the entire project. Note, however, if there is a lack of environmental analysis for adjoining lands, additional effort may be needed.

Provide Economic Incentives for Development in SEZs

- The BLM anticipates lower cost recovery for projects proposed in SEZs because of the BLM's extensive upfront data collection and environmental review through the Solar PEIS.

- The BLM may institute lower MW capacity fees for projects proposed in SEZs, which could effectively reduce the overall cost to operators.

- The BLM may adopt a longer phase-in period for rental payments for projects proposed in SEZs (e.g., 10 years), which could effectively reduce the overall cost to operators.

- The BLM may establish a fixed MW capacity fee rental payment for the life of the authorization for projects in SEZs, which could effectively reduce the overall cost to operators.

- The BLM may require a limited base acreage rental payment for projects proposed in SEZs, which could effectively reduce the overall cost to operators.

- The BLM may restructure bonding requirements for projects proposed in SEZs (e.g., provide credit for salvage value of materials and equipment), which could result in reduced costs to operators.

- The BLM may issue a 30-year fixed term lease with a fixed rental fee, which could reduce uncertainty for operators.

2.2.2.2.4 Proposed Withdrawal for SEZs

As described in the Draft Solar PEIS (Section 1.3.5), as a possible mechanism to support the establishment of priority areas, the Secretary of the Interior may decide to withdraw the public lands encompassed by SEZs from potentially conflicting uses through the issuance of a Public Land Order. If approved, the public lands would be withdrawn, subject to valid existing

rights, from settlement, sale, location, or entry under the general land laws, including the mining laws, as follows:

- Lands could not be appropriated, sold, or exchanged during the term of the withdrawal.

- New mining claims could not be filed on the withdrawn lands; however, valid mining claims filed prior to the withdrawal would take precedence over future solar energy development.

- Withdrawn lands would remain open to mineral leasing, geothermal leasing, and mineral material laws; the BLM could elect to lease the oil, gas, coal, or geothermal steam resources, or to sell common variety mineral materials such as sand and gravel if the authorized officer determined there would be no unacceptable impacts on future solar energy development.

- Withdrawn lands would remain open to ROW authorizations.

On June 30, 2009, the BLM sought and received permission from the Secretary of the Interior to issue a notice of proposed withdrawal for the original 24 identified Solar Energy Study Areas. This *Federal Register* notice (74 FR 31308) segregated the public lands encompassed in the 24 Solar Energy Study Areas (approximately 676,000 acres [2,735.7 km^2]) for up to 2 years from surface entry and mining, while various studies and analyses were conducted to support a final decision on withdrawing the land from conflicting uses. On April 21, 2011, the BLM amended the proposed withdrawal through a notice in the *Federal Register* (76 FR 22414) to reflect acreage adjustments for slope considerations and compatibility (approximately 677,384 acres [2,741 km^2]). The BLM's temporary segregation expired on June 29, 2011.

On June 30, 2011, the BLM applied its new ITFR to the 24 proposed SEZs to avoid a lapse in the existing segregation (see Section 1.8.1 of this Supplement for additional information). On the basis of the application of the ITFR, the terms of the segregation for the 24 proposed SEZs remain unchanged; however, it is now set to expire June 30, 2013.

The BLM held two public meetings in connection with the proposed withdrawal. The first meeting was held on July 6, 2011, in Las Vegas, Nevada; the second meeting was held on July 7, 2011, in Victorville, California. The public was given an opportunity to provide oral and written comments at these meetings, as well as in writing via notification in the *Federal Register*. Public comments have helped inform some of the decisions on the SEZs presented in this Supplement.

The BLM intends to amend its withdrawal proposal to reflect the changes to the proposed SEZs described in this Supplement. The amended withdrawal proposal will include only those lands within SEZs that are proposed to be carried forward through the Final Solar PEIS. The BLM will seek approval to change the proposed withdrawal period from 5 to 20 years. Also by notice in the *Federal Register,* the temporary segregation of lands in SEZs (applied through the

ITFR described above) will be removed for all proposed SEZs and portions of proposed SEZs that have been dropped from further consideration by the BLM.

The required withdrawal studies and analyses will be completed as part of the Final Solar PEIS, including full Mineral Reports that meet the standards set forth in 43 CFR Part 2300 and BLM Manual 3060 (BLM 1994). The Secretary of the Interior's final decision regarding the withdrawal of these lands will be made based on the Solar PEIS. However, the Secretary's ROD pertaining to the withdrawal will likely be made separate from and subsequent to the BLM's ROD for the Solar PEIS.

2.2.2.2.5 Proposed Identification Protocol for New SEZs

The SEZs being carried forward in this Supplement identify approximately 285,000 acres (1,153 km^2) across the 6-state study area. In addition, the BLM has made a commitment to continue processing pending applications. Although this is a strong start in facilitating utility-scale solar energy development on public lands, the BLM intends to identify new SEZs and/or expand existing SEZs on an as-needed basis. The BLM has already initiated efforts to identify new SEZs in the states of California, Arizona, Nevada, and Colorado through ongoing state-based efforts (see Section 2.2.2.2.6 of this Supplement for more information) and anticipates identifying new or expanded SEZs in the remaining states in the near future. The BLM welcomes industry, environmental organizations, government partners, Tribes, and the public to participate in these efforts to identify new SEZs through petitions or participation in ongoing land use planning activities (see Appendix D of this Supplement).

The BLM believes that having a workable process to identify new SEZs is an essential element of its overall approach to solar energy development. The process must be open and transparent, with opportunities for substantial stakeholder involvement, including solar industry and transmission providers. This protocol establishes a process that would be undertaken at the state or field office level as an individual land use planning effort or as part of an ongoing land use plan revision. It is BLM's goal to complete the work to identify new SEZs and amend applicable land use plans within 12 to 18 months of initiating such effort.

New or expanded SEZs should be identified in the context of existing solar market conditions, existing and planned transmission systems, and new state or federal policies affecting the level and location of utility-scale solar energy development. The BLM will assess the need for new or expanded SEZs a minimum of every 5 years in each of the six states covered by the Solar PEIS. The assessment of need may take place as part of on-going state-based planning processes or as a separate effort.

Figure 2.2-1 outlines a step-by-step protocol for identifying new SEZs. This step-by-step protocol is described in detail in Appendix D of this Supplement. To make effective use of ongoing collaborative efforts, the BLM will rely on the California DRECP planning effort, the Arizona RDEP, and the California West Chocolate Mountains Renewable Energy Evaluation Area (REEA) effort to identify new or expanded SEZs in these planning areas in the near term (see Section 2.2.2.2.6 of this Supplement).

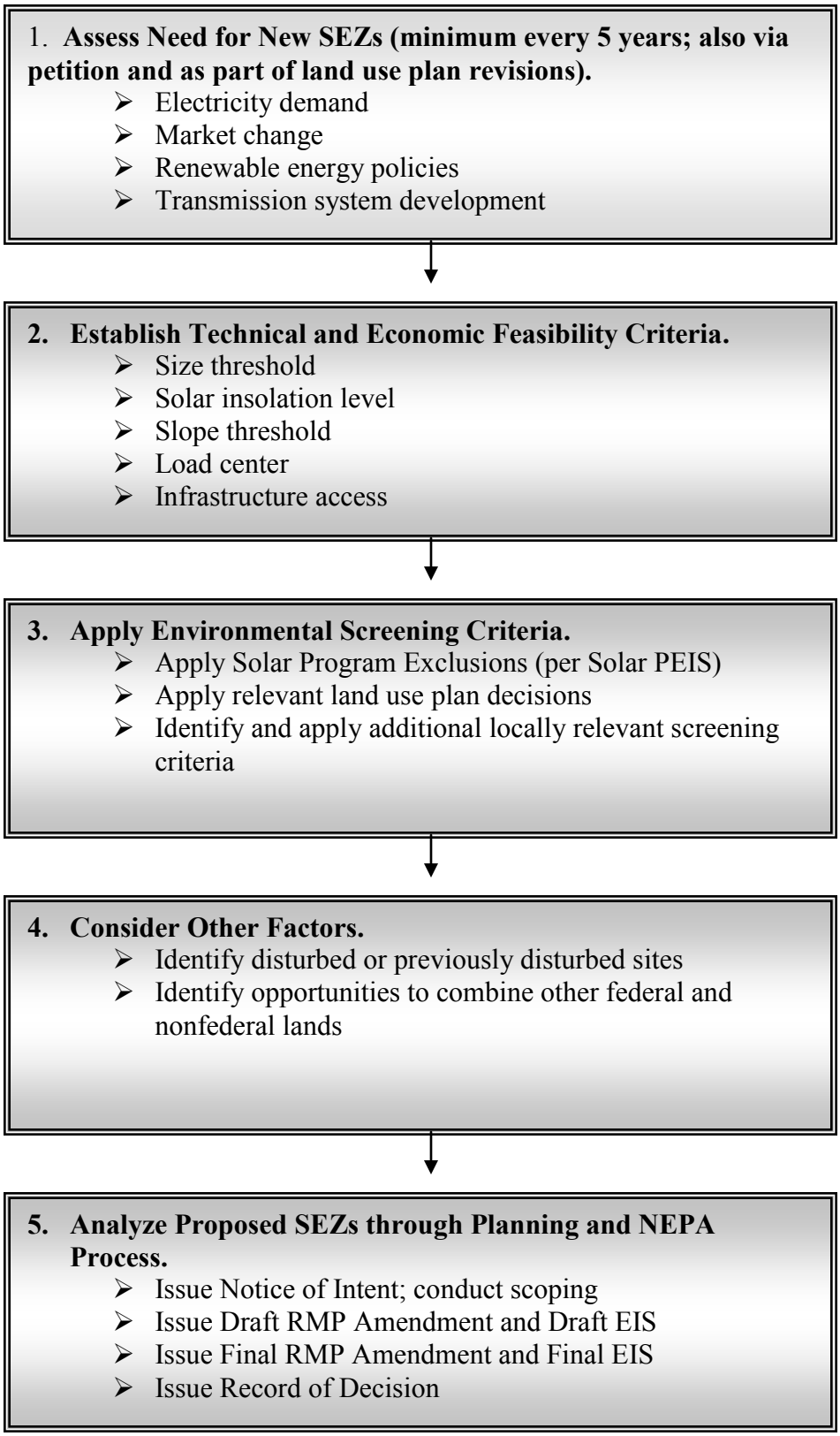

FIGURE 2.2-1 Proposed SEZ Identification Protocol (approximately 12 to 18 months to complete)

2.2.2.2.6 Ongoing Efforts to Analyze New SEZs

On the basis of the reduced number of SEZs being carried forward for consideration in the Final Solar PEIS, the BLM has identified an immediate need for additional SEZs in some states. For example, in Arizona, the RFDS is 2,424 MW, corresponding to approximately 22,000 acres (89 km^2). Changes to proposed SEZs, however, have resulted in only about 6,500 acres (26 km^2) of SEZs being carried forward in Arizona. Market demand in California indicates a similar demand for additional SEZs there. The BLM has initiated efforts to consider identifying new SEZs in these states. Such efforts are taking place outside of the Solar PEIS process but consistent with the principles outlined in the SEZ identification protocol proposed in this Supplement. The BLM believes that the future identification of new SEZs will most appropriately be managed at the BLM state and/or field office levels where there is a better understanding of need and potential resource conflicts.

Ongoing efforts that will result in the identification of new SEZs include Arizona's RDEP, California's DRECP, and California's West Chocolate Mountains REEA planning effort. In addition, the BLM will encourage local land use planning efforts to consider the need for, and identify as appropriate, new SEZs as part of ongoing land use plan revisions. Currently, plan revisions in Nevada and Colorado are pursuing this approach. Ongoing efforts to identify new SEZs and associated time lines are described below. All SEZs identified through these efforts would be analyzed through a planning and NEPA process at a level similar to the analysis in the Solar PEIS to ensure that key issues, such as wildlife, cultural resources, transmission, and cumulative impacts, are fully considered. The authorization of future projects in these SEZs would involve tiered-NEPA analyses as in the case of SEZs to be identified through the Solar PEIS. Projects proposed in SEZs that have been identified and analyzed through state or local land use planning efforts are expected to receive the same incentives as SEZs identified through the Solar PEIS.

Arizona's Restoration Energy Design Project

Arizona's RDEP was chartered in 2009 by the Secretary of the Interior to support the efforts for sustainable energy and to pilot the concept of using disturbed and low-conflict lands for renewable energy. The RDEP is both a state-level step-down to the Solar PEIS decisions and a revision of all land use plans in Arizona to integrate and update them with renewable energy land use allocations. RDEP will analyze and consider the identification of additional lands for renewable energy development (solar and wind) at any scale and in multiple jurisdictions.

The RDEP allows a look across all ownership and jurisdictional management of lands. It addresses the nexus of public lands with renewable energy potential to the generation and transmission system and provides information to policy- and decision-makers in Arizona for siting and development. RDEP will inform logical utility-scale siting (beyond just opportunities on public lands) and determine which public lands fit best.

The RDEP will provide for the integration of all renewable energy planning designations at the local and state level, based on environmental considerations (low resource conflicts), and

will be tailored to fit with the state- wide transmission system and existing generation facilities. In addition to utility-scale opportunities, the RDEP will also offer information to assist in siting of community-level distributed energy generation with diminished transmission requirements.

For utility scale-solar development specifically, the RDEP will serve as a step-down analysis to the Solar PEIS. The RDEP will consider the identification of an additional SEZ, consider increasing the Arizona acreage identified for renewable energy, and may help to streamline the variance process for some of the variance areas potentially identified through the Solar PEIS ROD. The RDEP will consider amending land use plans in Arizona to potentially identify the following:

- One additional SEZ, the Agua Caliente SEZ (22,000 acres [89 km^2]), that will be provided the same level of inventory and analysis as the SEZs in the Solar PEIS;

- Renewable Energy Development Areas (REDAs), areas within the larger utility-scale solar energy variance areas that have been intensively pre-screened and analyzed for suitability for development. It is anticipated that applications proposed in REDAs would comply with the variance process and therefore could qualify for priority processing. This will serve as an additional incentive for developers.

The RDEP Draft EIS is expected to be published in January 2012, the Final EIS in October 2012, and the ROD in December 2012.

California's Desert Renewable Energy Conservation Plan

In 2008 and 2009, BLM California (BLM-CA) and the DOI signed Memoranda of Understanding with the California Governor's Office codifying the Renewable Energy Action Team (REAT), initiating the Renewable Energy Policy Group (REPG), and establishing BLM-CA's role in the DRECP. BLM-CA, the California Energy Commission (CEC), the California Department of Fish and Game (CDFG), and the USFWS form the core of the REAT and REPG, with additional participation from other state and federal agencies. The core REAT agencies are leading the development of the DRECP.

The DRECP is the largest landscape-level planning effort in California, covering approximately 22.5 million acres (91,054 km^2) of federal and nonfederal land in the Mojave and Colorado (Sonoran) Deserts of southern California. The planning area covers all or portions of seven counties, including Kern, Los Angeles, San Bernardino, Inyo, Riverside, Imperial, and San Diego. Approximately 10 million acres (40,469 km^2) of the DRECP are administered by the BLM-CA under the CDCA plan and under the Bishop, Caliente/Bakersfield, and Eastern San Diego County RMPs.

The purpose of the DRECP is to advance state and federal species and ecosystem conservation goals in the deserts of southern California, while also facilitating the timely permitting of renewable energy projects on federal and nonfederal lands.

BLM-CA intends to use the DRECP as the foundation for possible amendments to the CDCA Plan and three RMPs. The DRECP is also being designed as a Habitat Conservation Plan in accordance with the ESA and a Natural Communities Conservation Plan in accordance with the California Natural Communities Conservation Planning Act. Through potential land use plan amendments (CDCA and three RMPs), the DRECP may be used to identify priority areas for renewable energy development (potentially through the identification of additional SEZs) and associated conservation on BLM lands within the DRECP planning area.

The DRECP Draft EIS is expected to be published in May 2012, the Final EIS in November 2012, and the ROD in January 2013.

California's West Chocolate Mountains Renewable Energy Evaluation Area

The BLM is currently engaged in a planning effort within the West Chocolate Mountains near the Salton Sea in Imperial County, California (referred to as the West Chocolate Mountains REEA).Through this effort, the BLM is evaluating the potential environmental impacts associated with renewable energy testing and development on public lands within the West Chocolate Mountains REEA, including solar, wind, and geothermal. The proposed planning area covers approximately 17,900 acres (72 km^2) of BLM-administered public lands.

The West Chocolate Mountains planning effort is expected to result in amendments to the CDCA Plan of 1980 (BLM 1999) to identify sites within the West Chocolate Mountains REEA as suitable and not suitable for solar and wind energy development, and geothermal leasing and development. Some SEZs for renewable energy development, including utility-scale solar energy, may also be identified.

The Draft EIS for the West Chocolate Mountains REEA was published in June 2011. The Final EIS is expected to be published in December 2011, with a ROD expected in April 2012.

Other Planning Efforts

The BLM is engaged in several RMP revisions that are looking at opportunities to identify renewable energy priority areas such as new SEZs. Examples include the Las Vegas-Pahrump RMP revision in Nevada, which has a draft scheduled for release in October 2012, and the Grand Junction RMP revision in Colorado, which has a draft scheduled for release in September 2012.

2.2.2.3 Proposed Variance Areas for Utility-Scale Solar Energy Development

In order to accommodate the flexibility described in the BLM's program objectives, the modified program alternative allows for responsible utility-scale solar development outside of SEZs. The BLM proposes to identify lands outside of proposed exclusion areas and SEZs as variance areas for utility-scale solar energy development. Variance areas would be open to application but would require developers to adhere to the variance process detailed in Section 2.2.2.3.1 of this Supplement.

The proposed variance areas and associated variance process would only apply to utility-scale solar development, which is defined for the purposes of the Solar PEIS as projects capable of generating 20 MW or greater of electricity. All nonutility-scale solar energy projects, including distributed generation, would follow existing management prescriptions in BLM land use plans and be subject to individual site-specific NEPA analyses.

As the BLM continues to refine the list of proposed exclusions under the modified program alternative (see Section 2.2.2.1 of this Supplement), the amount of land in variance areas will likely be reduced. A final proposal for exclusions, and therefore variance areas, will be presented in the Final Solar PEIS.

The variance process presented in the following section replaces components of Appendix A in the Draft Solar PEIS and incorporates applicable elements of BLM Instruction Memoranda in existence or released after the publication of the Draft Solar PEIS.

2.2.2.3.1 Variance Process

The variance process provides an opportunity for developers to propose applications outside of identified SEZs and complements the directed development approach in the modified program alternative. Variances may be needed in the near-term because the lands identified as SEZs might be insufficient to accommodate demand for utility-scale solar development. In addition, there might be market, technological, or site-specific factors that make a project appropriate in a non-SEZ area. The BLM will consider variance applications on a case-by-case basis based on environmental considerations; consultation with appropriate federal, state, and local agencies, and Tribes; and public outreach. All variance applications that the BLM determines to be appropriate for continued processing will subsequently be required to comply with NEPA and all other applicable laws, regulations, and policies at the applicant's expense. Applicants applying for a variance must assume all risk associated with their application and understand that their financial commitments in connection with their applications will not be a determinative factor in BLM's evaluation process.

Pre-application Meeting

The BLM will require prospective applicants to schedule and participate in two pre-application meetings with the BLM before filing a variance application in variance areas

(43 CFR 2804.10(a)). The purpose of the first pre-application meeting is to discuss the status of BLM land use planning in the area, potential land use and siting constraints, potential environmental issues in the area, potential alternative site locations for the project, and the variance process itself, including cost-recovery requirements, application requirements, consultation requirements, public involvement requirements, and associated time lines. The purpose of the second pre-application meeting is to initiate and ensure early coordination with federal (e.g., NPS and USFWS), state, and local government agencies and Tribes as required by the regulations (43 CFR 2804.10(b)). Through pre-application discussions, the BLM and other agencies will identify information that applicants would likely be required to gather to document natural and/or cultural resources present in the area. Note pre-application meetings are not covered by cost-recovery fees under the BLM's ROW program.

Variance Application Process

Applicants seeking to develop projects in variance areas will be required to submit a ROW application to the BLM (Form SF-299, Application for Transportation and Utility Systems and Facilities on Federal Land). In the case of a variance, the POD submitted with an application must be of sufficient detail (as determined by the BLM) to evaluate the suitability of the site for utility-scale solar energy development. Specific information is outlined below.

Applicants applying for a variance must establish a cost-recovery account sufficient to cover all costs associated with accepting, reviewing, and processing a variance application, including, but not limited to conducting environmental review and related consultations; conducting cultural resource inventory and related consultations; and conducting inventories for special status species, lands with wilderness characteristics, or specially designated areas. Cost-recovery fees are collected after a ROW application is submitted and a cost-recovery agreement is established with the applicant (43 CFR 2804.14).

Variance Application/Plan of Development (POD) Factors To Be Considered

The BLM will consider the following factors when evaluating variance applications:

- The financial and technical capability of the applicant, including but not limited to:
  - International or domestic experience with solar projects on federal or nonfederal lands,
  - Sufficient capitalization to carry out development

- The availability of an SEZ served by transmission in the same state as the applicant's proposal.

- If applicable, documentation that the proposed project will be located in an area identified as suitable for solar energy development by another related

process such as the California DRECP or Arizona RDEP. Such an application may be given priority status and processed as though it were in an SEZ.

- Any special circumstances associated with an application such as an expansion or repowering of an existing project or unique federal–nonfederal partnership.

- Documentation that the proposed project will be located in an area with low resource value and where minimal conflict with adjacent lands is likely (e.g., previously contaminated or disturbed lands such as brownfields identified by the U.S. Environmental Protection Agency's RE-Powering America's Land Initiative (http://www.epa.gov/renewableenergyland/); mechanically altered lands such as fallowed agricultural lands; idle or underutilized industrial areas; lands adjacent to urbanized areas and/or load centers; previously reclaimed lands; or areas repeatedly burned and invaded by fire-promoting non-native grasses).

- *Desert Tortoise Variance Process Requirements under Consideration*:

  Desert tortoise conservation areas are excluded from BLM's proposed Solar Energy Program (Figure 2.2-2—note that small areas of overlap will be resolved for the Final Solar PEIS). These areas include, but are not limited to, all critical habitat for desert tortoise and specially designated areas such as National Parks, National Recreation Areas, and National Wildlife Refuges. With respect to evaluation of potential impacts on desert tortoise, the BLM is seeking comments on two Options for applications received in variance areas:

  Option 1:
  No special variance application requirements for desert tortoise. The BLM will consider all variance applications within the range of desert tortoise on a case-by-case basis in coordination with the USFWS.

  Option 2:
  For all applications in variance areas that are within the range of desert tortoise but located outside of proposed connectivity areas (see light blue areas in Figure 2.2-2), the applicant must provide documentation of the following:
  - Project area has less than or equal to 5 tortoises (>160 mm Midline Carapace Length) per square mile.
  - Based on the USFWS pre-project tortoise survey, the point estimate for tortoises needing to be translocated would be less than or equal to 35 tortoise (>160 mm Midline Carapace Length).
  - The project is sited in a manner that maintains at least one 3 mi (5 km) wide, minimally disturbed connectivity corridor to ensure that the project does not isolate or fragment tortoise habitat and populations.

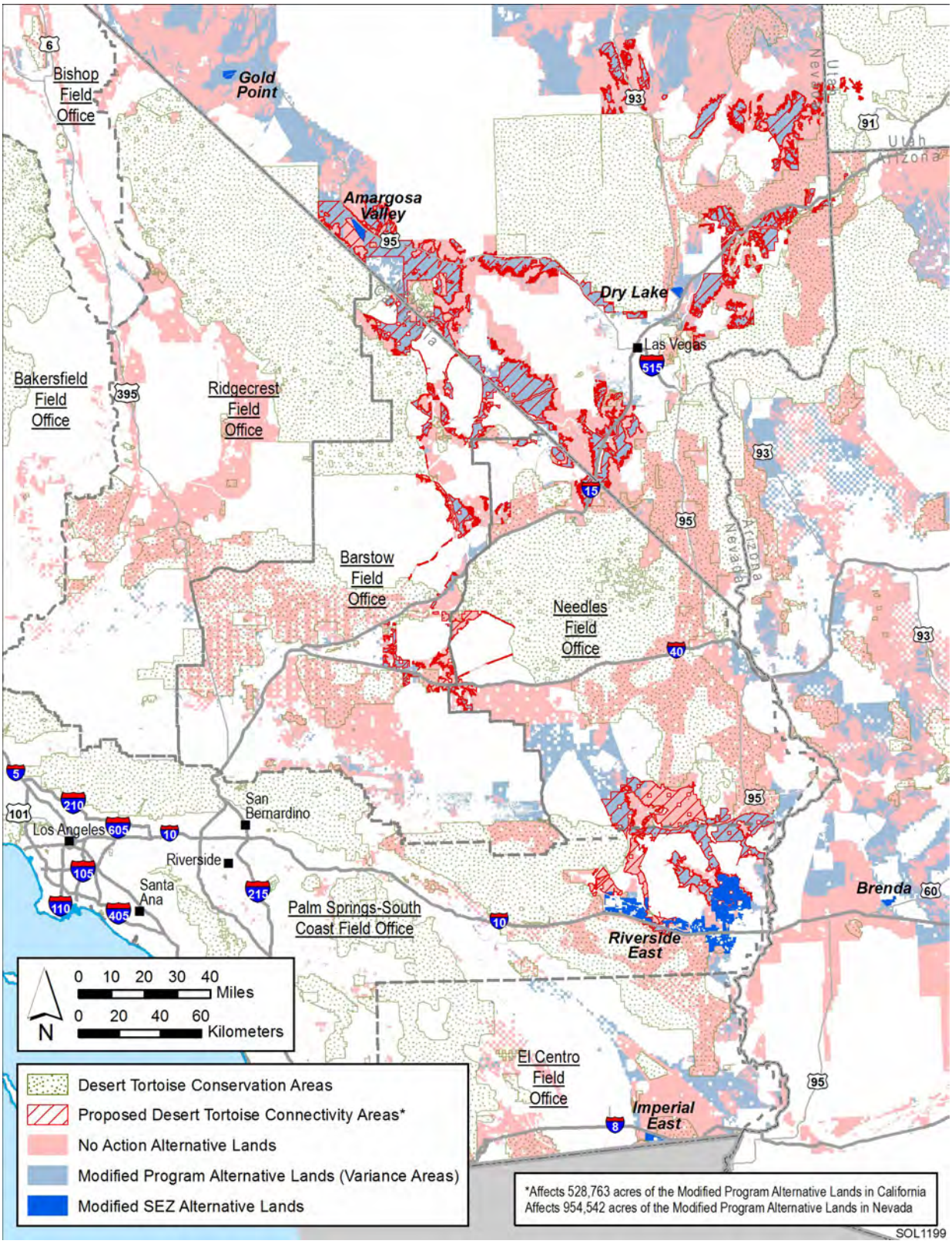

FIGURE 2.2-2 Desert Tortoise Conservation Areas and Proposed Connectivity Areas

For all applications in variance areas within the range of desert tortoise and within proposed connectivity areas (see red hatched areas in Figure 2.2-2), siting will be discouraged given anticipated high conflict. However, if a variance application is submitted in this area, applicants will be subject to the translocation limitations and maintenance of minimally disturbed connectivity corridors as described above. In addition, applicants will work with the BLM and USFWS to survey an area 3 to 4 times larger than the proposed project area in an attempt to find a suitable project location that meets all of the following criteria:

  - Projects will be sited in the lowest tortoise density area surveyed and will not exceed 2 tortoise per square mile.
  - Projects will be sited in locations where native vegetation communities are degraded or soils are compacted, such that habitat restoration potential is low.
  - Mitigation for projects within the tortoise connectivity areas should be prioritized to improve conditions within the connectivity area, and if these options do not exist, mitigation should be applied toward the nearest tortoise conservation area (e.g., Desert Wildlife Management Area [DWMA] or critical habitat).

- *Greater Sage-Grouse Requirements*. For all variance applications within the range of the greater sage-grouse, the applicant must provide documentation of the following:
  - Project is at least 3 mi (5 km) from the nearest lek.
  - Project will not remove preliminary priority habitat.
  - Project will be mitigated through land acquisition or habitat enhancement 1:1 for the impact on sage-grouse habitat.

- Documentation that the proposed project will minimize the need to build new roads and/or transmission infrastructure (e.g., transmission with existing capacity and substations is already available; or minimal additional infrastructure would be needed, such as incremental transmission re-conductoring or upgrades).

- Documentation that the proposed project will make highly efficient use of the land considering the solar resource, the technology to be used, and the proposed project layout.

- Documentation that the proposed project will meet all required design features adopted in the ROD for the Solar PEIS (currently presented in Appendix A of the Draft Solar PEIS).

- Documentation that the proposed project will minimize impacts on water resources.

- For applications in the DRECP planning area, documentation that the proposed project will be consistent with the biological goals and objectives of the plan.

- Documentation that the proposed project will be consistent with priority conservation, restoration, and/or adaptation objectives in best available landscape-scale information (e.g., landscape conservation cooperatives, rapid ecological assessments, and state-level crucial habitat assessment tools).

- Any opportunities to combine federal and nonfederal lands for optimum siting.

BLM Coordination Activities

To assist in the evaluation of variance applications, the BLM will coordinate, as necessary, with appropriate federal, state, and local government agencies; and Tribes. Consideration should be given to the following:

- Consistency with the plans and policies of other government entities.

- Consultation with Tribes. Government-to-government consultation with Tribal staff will provide opportunities for Tribes to identify traditional cultural properties and sacred sites with applications in variance areas. Tribes will be invited to attend pre-application meetings with the applicant and the BLM. On the basis of information and discussions arising from the pre-application meetings, the BLM will determine whether there is a need for new ethnographic research to provide sufficient information to adequately consider the effects of solar development on issues and resources of concern to Tribes. BLM field office cultural staff, including specialists assigned to Renewable Energy Coordination Offices where present, in consultation with their Deputy Preservation Officer, shall recommend to responsible BLM line officers whether new ethnographic data are required for a given solar application. Should new ethnographic research, studies, or interviews be judged necessary, the BLM cultural staff, in consultation with Tribal officials, will recommend to BLM line officers the appropriate scope of the study, provisions for safeguarding data confidentiality, and programs of mitigation.

- Consultation with the SHPO. The BLM, in consultation with the SHPO, will determine what steps will be required to identify historic properties in the area of effect for the variance application. Additional inventories may include Class II and/or Class III surveys. Such inventories of areas of direct and indirect effect must be completed prior to formal submission of a completed application. On the basis of the results of the inventory, determinations of eligibility of sites to the *National Register of Historic Places* (NRHP), and

determinations of effect, programs of mitigation would be approved by the BLM and carried out by the applicant prior to ground disturbance.

- Coordination with the USFWS on any application that would result in impacts on:
  - Desert tortoise connectivity areas,
  - Sage-grouse areas of concern,
  - Golden eagles, and
  - Other trust resource concerns.

- Coordination with state fish and wildlife agencies.

- Consultation with the NPS on any application that would result in impacts on the resources and values of units of the National Park System and other special status areas under NPS and/or BLM administration (e.g., National Historic Trails). The applicant may be required by the NPS to provide documentation of potential project impacts on sensitive park resources, including but not limited to, daytime and night sky views, water sources, air quality, habitats and ecosystems, wilderness areas, and natural sounds.

- Consultation with the NPS and U.S. Forest Service (USFS) administration/ management for National Scenic and Historic Trails.

- Consultation with the DoD.

- For applications in the DRECP planning area, coordination with California REAT agencies (BLM, USFWS, CDFG, and CEC).

- Coordination with state and regional transmission planning efforts (e.g., Western Governors Association, California Renewable Energy Transmission Initiative, Nevada Renewable Energy Transmission Access Advisory Committee, New Mexico Renewable Energy Transmission Authority), transmission coordination authorities (e.g., WECC), state energy offices, and transmission system operators to evaluate transmission access issues in the project area and to maximize coordination with ongoing efforts.

- Communication with any potentially affected grazing permittee/lessee.

- Communication with the owner of any federal mining claims and/or mineral leases located with the boundaries of the proposed project.

Public Meeting

The BLM has the discretion to require a pre-scoping public meeting that falls outside of the NEPA process for variance applications to assist in the identification of potential issues connected with the proposal.

2.2.2.3.2 Variance Process Determination

The BLM has determined that, in appropriate circumstances, it can rely on the broad discretion it has under FLPMA to deny ROW applications without completing the NEPA process. Such decisions must be made with regard for the public interest and be supported by reasoned analysis and an adequate administrative record. Decisions to deny pending applications must be assessed on a case-by-case basis. BLM's denial of an application constitutes a "final agency action" and is therefore subject to administrative appeals to the IBLA.

On the basis of the information provided by the applicant, and the input of federal, state, and local government agencies, Tribes, and the public for a variance, the BLM will determine whether it is appropriate to continue to process the submitted ROW application or to deny the application. Variance evaluations will be conducted at the BLM field and state office levels.

All variance applications that are determined to be appropriate for continued processing will be submitted by the State Director to the BLM Washington Office for the Director's concurrence. The Director also has the discretion to offer lands determined to be appropriate for continued processing under competitive procedures. In making this determination, the Director will consider variables such as public interest, market demand for solar development in the region, expressions of interest from other parties, authorized use and/or ownership of adjoining lands, and the purpose of the project.

All variance applications that the BLM determines to be appropriate for continued processing will subsequently be required to comply with NEPA and all other applicable laws, regulations and policies at the applicant's expense, including but not limited to the ESA, the NHPA, and the NPS Organic Act of 1916. Proposed projects in variance areas will require consideration of alternatives and will likely result in an environmental impact statement level of NEPA documentation. Compliance with applicable laws, regulations, and policies could result in substantial changes to a project proposal or application denial.

2.2.2.4 Land Use Plans To Be Amended

Land use plans in the six-state study area would be amended under the modified program alternative to incorporate the planning components of the proposed Solar Energy Program. Appendix E, Table E-1, of this Supplement lists all of the land use plans to be amended. The amendments would identify (1) lands that would be excluded from utility-scale solar energy development, (2) lands to be included in SEZs, and (3) lands that would be identified as variance areas for utility-scale solar energy development. The plans would also be amended to adopt the

proposed program and SEZ-specific design features described in the Draft Solar PEIS and Supplement.

2.2.3 Modified SEZ Program Alternative

Under the modified SEZ program alternative (referred to as ~~"~~modified SEZ alternative"), the BLM would restrict utility-scale solar energy development applications to SEZs only, and identify all other lands as exclusion areas for utility-scale solar energy development. The proposed authorization policies described in the modified program alternative would apply to applications in SEZs under the modified SEZ alternative.

2.2.3.1 Proposed Right-of-Way Exclusion Areas

Under the modified SEZ alternative, all areas outside of identified SEZs would be identified as exclusion areas for utility-scale solar energy development. No lands would be identified as variance areas for utility-scale solar energy development.

2.2.3.2 Proposed Solar Energy Zones

The proposed SEZs to be carried forward into the Final Solar PEIS under the modified SEZ alternative are the same as those described under the modified program alternative (see Section 2.2.2.2). The BLM is committed to collecting additional SEZ-specific resource data and conducting additional analysis in order to more effectively facilitate development in SEZs. The BLM has developed individual action plans for SEZs as part of this Supplement that describe data gaps for individual SEZs and propose data sources and methods for the collection of additional data. The action plans are presented in Appendix C of this Supplement. The BLM will prioritize the collection of additional data and analysis in those SEZs that are most likely to be developed in the near-future. Note that additional data and analysis will help facilitate development in SEZs but is not required to identify an area as an SEZ as part of the BLM's Solar Energy Program.

2.2.3.2.1 Solar Energy Zone Policies

The policies presented under the modified program alternative are also applicable to the modified SEZ alternative, including the authorization process for projects in SEZs, incentives for projects in SEZs, the protocol to identify new SEZs, and the proposed withdrawal of SEZs. Also, as described previously, the BLM has initiated efforts to identify new SEZs that are outside of the Solar PEIS but consistent with the principles outlined in this Supplement (see Appendix D of this Supplement).

2.2.3.3 Land Use Plans To Be Amended

Land use plans in the six-state study area would be amended under the modified SEZ alternative to incorporate the planning components of the proposed Solar Energy Program. Appendix E, Table E-1, of this Supplement lists all of the land use plans to be amended. The amendments would identify (1) lands that would be excluded from utility-scale solar energy development and (2) lands to be included in SEZs. Under the modified SEZ alternative, no lands would be identified as variance areas for utility-scale solar energy development (i.e., all lands outside of identified SEZs would be excluded from utility-scale solar development). The land use plans would also be amended to adopt the proposed program and SEZ-specific design features described in the Draft Solar PEIS and this Supplement.

2.3 ANALYSIS OF BLM'S MODIFIED ACTION ALTERNATIVES

This section presents an analysis of the BLM's two modified action alternatives. No change to the no action alternative is being proposed as part of this Supplement; analysis of the no action alternative can be found in the Draft Solar PEIS (Section 6.3). For comparative purposes, however, information on the no action alternative has been presented in summary tables throughout this section.

Table 2.3-1 lists the approximate amount of land that would be available for utility-scale solar ROW application in each state under the no action alternative and the modified action alternatives. Figures 2.3-1 through 2.3-6 show the approximate locations of these lands and of specifically excluded BLM-administered lands.

This section evaluates the modified action alternatives in terms of their effectiveness in meeting the objectives outlined as part of BLM's purpose and need for action (see Section 1.3 of this Supplement). The BLM's objectives include the following:

- Facilitating near-term utility-scale solar energy development on public lands;
- Minimizing potential negative environmental, social, and economic impacts;
- Providing flexibility to consider a variety of solar energy projects (e.g., location, facility size, and technology);
- Optimizing existing transmission infrastructure and corridors; and
- Standardizing and streamlining the authorization process for solar energy development on BLM-administered lands.

This section also evaluates the extent to which the modified action alternatives would assist the BLM in meeting the projected demand for utility-scale solar energy development, as estimated by the RFDS developed for the Draft Solar PEIS (see Section 1.6 of this Supplement). The extent to which each alternative would assist the BLM in meeting the mandates of the

TABLE 2.3-1 Summary of Potentially Developable BLM-Administered Land under the No Action Alternative, the Modified Solar Energy Development Program Alternative, and the Modified SEZ Program Alternative[a]

State	Total State Acreage[b]	BLM-Administered Lands Constituting No Action Alternative (acres)[c]	BLM-Administered Lands Constituting Modified Program Alternative (acres)[c,d]	BLM-Administered Lands Constituting Modified SEZ Alternative (acres)
Arizona	72,700,000	9,181,178 (9,218,009)	3,397,007 (4,485,944)	6,465 (13,735)
California	100,200,000	10,815,285 (11,067,366)	1,354,559 (1,766,543)	153,627 (339,090)
Colorado	66,500,000	7,282,258 (7,282,061)	111,059 (148,072)	16,308 (21,050)
Nevada	70,300,000	40,760,443 (40,794,055)	9,207,288 (9,084,050)	60,395 (171,265)
New Mexico	77,800,000	11,783,665 (12,188,361)	4,292,279 (4,068,324)	29,964 (113,052)
Utah	52,700,000	18,098,240 (18,182,368)	1,962,671 (2,028,222)	18,658 (19,192)
Total	440,200,000	97,921,069 (98,732,220)	20,324,863 (21,581,154)	285,417 (677,384)

[a] Values are reported in number of acres. Acreages in parentheses are values from the Draft Solar PEIS, provided for comparison. To convert acres to km^2, multiply by 0.004047.

[b] From Table 4.2-1 of the Draft Solar PEIS.

[c] The acreage estimates were calculated on the basis of the best available geographic information system (GIS) data. Although no changes from the Draft Solar PEIS were made to the categories of lands included under the no action alternative, updated GIS data for National Landscape Conservation System (NLCS) lands resulted in a small decrease in the estimated acres (less than 1% of total). For the modified development program alternative lands, GIS data were not available for the entire set of exclusions; thus the exact acreage could not be calculated. Exclusions that could not be mapped would be identified during the ROW application process.

[d] As stated in Section 2.2.2.2 of the Draft Solar PEIS, the BLM originally planned to exclude contiguous areas of less than 247 acres (1 km^2) from the lands constituting the development program alternative, but then determined that it would be appropriate to include these smaller parcels. Values shown in this column for the modified program alternative include areas of less than 247 acres (1 km^2). Exclusion of these smaller parcels would result in a total decrease of approximately 1.74 million acres (7,001 km^2) from the modified program alternative across the six-state study area, for a total of approximately 18.6 million acres. This total area of 18.6 million acres is directly comparable to the 22 million acres identified as available under the program alternative in the Draft Solar PEIS (i.e., the area of proposed land available under the program alternative has been decreased by about 3.4 million acres after accounting for the change in treatment of areas less than 247 acres [1 km^2]).

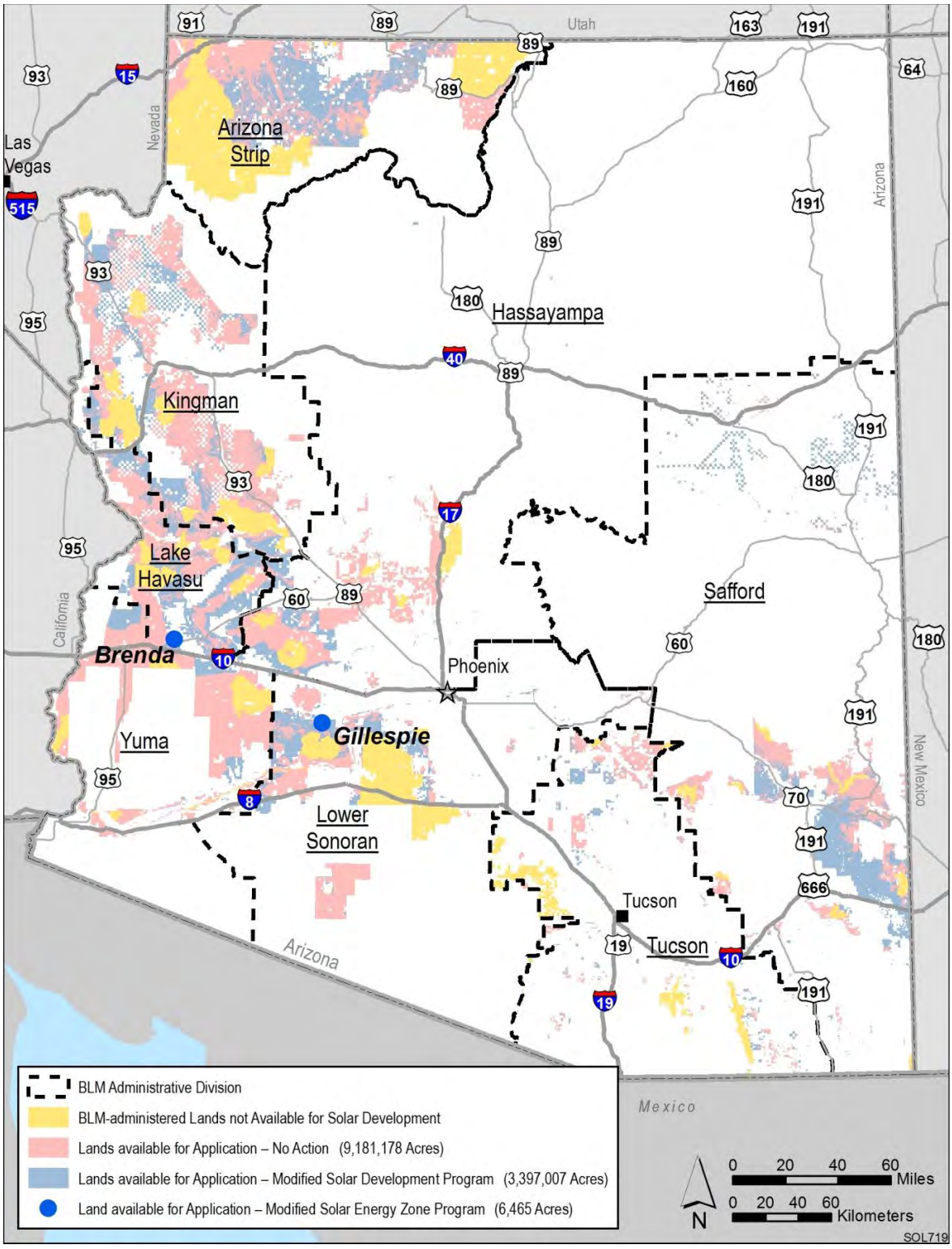

FIGURE 2.3-1 BLM-Administered Lands in Arizona Available for Application for Solar Energy ROW Authorizations under the Modified BLM Alternatives Considered in this Supplement (Note: the lands available under the no action alternative include both the pink and blue shaded areas.)

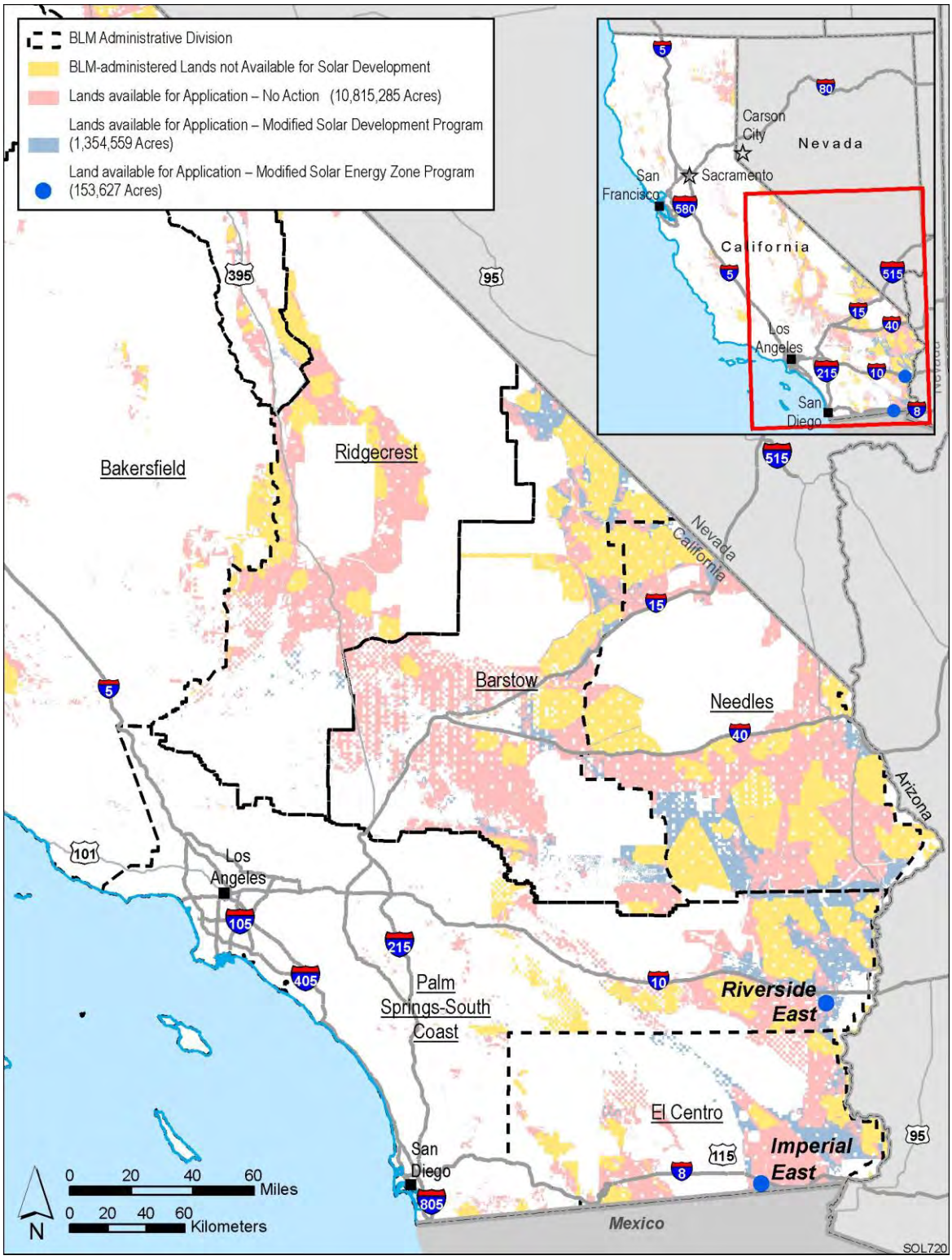

FIGURE 2.3-2 BLM-Administered Lands in California Available for Application for Solar Energy ROW Authorizations under the Modified BLM Alternatives Considered in this Supplement (Note: the lands available under the no action alternative include both the pink and blue shaded areas.)

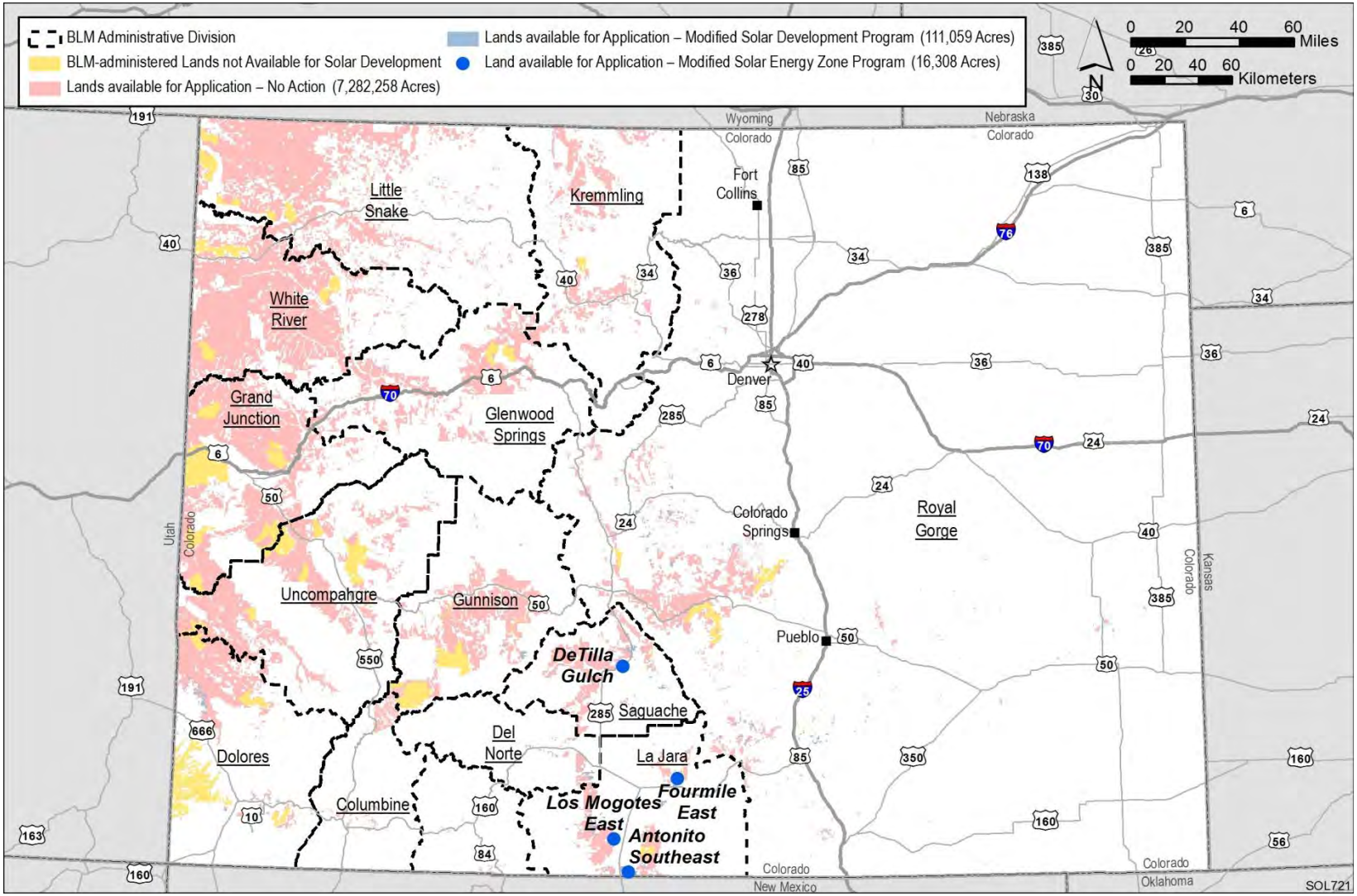

FIGURE 2.3-3 BLM-Administered Lands in Colorado Available for Application for Solar Energy ROW Authorizations under the Modified BLM Alternatives Considered in this Supplement (Note: the lands available under the no action alternative include both the pink and blue shaded areas.)

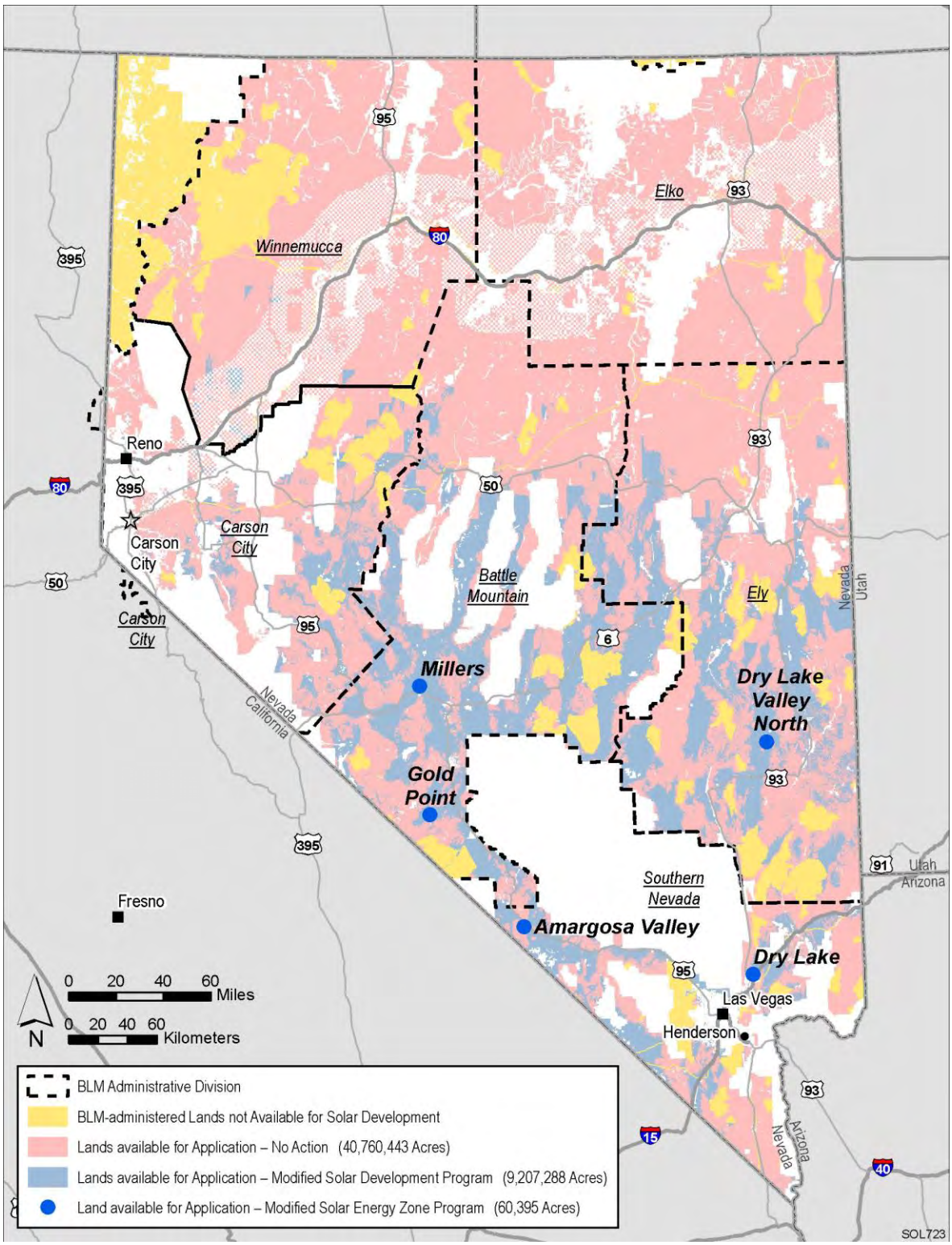

FIGURE 2.3-4 BLM-Administered Lands in Nevada Available for Application for Solar Energy ROW Authorizations under the Modified BLM Alternatives Considered in this Supplement (Note: the lands available under the no action alternative include both the pink and blue shaded areas.)

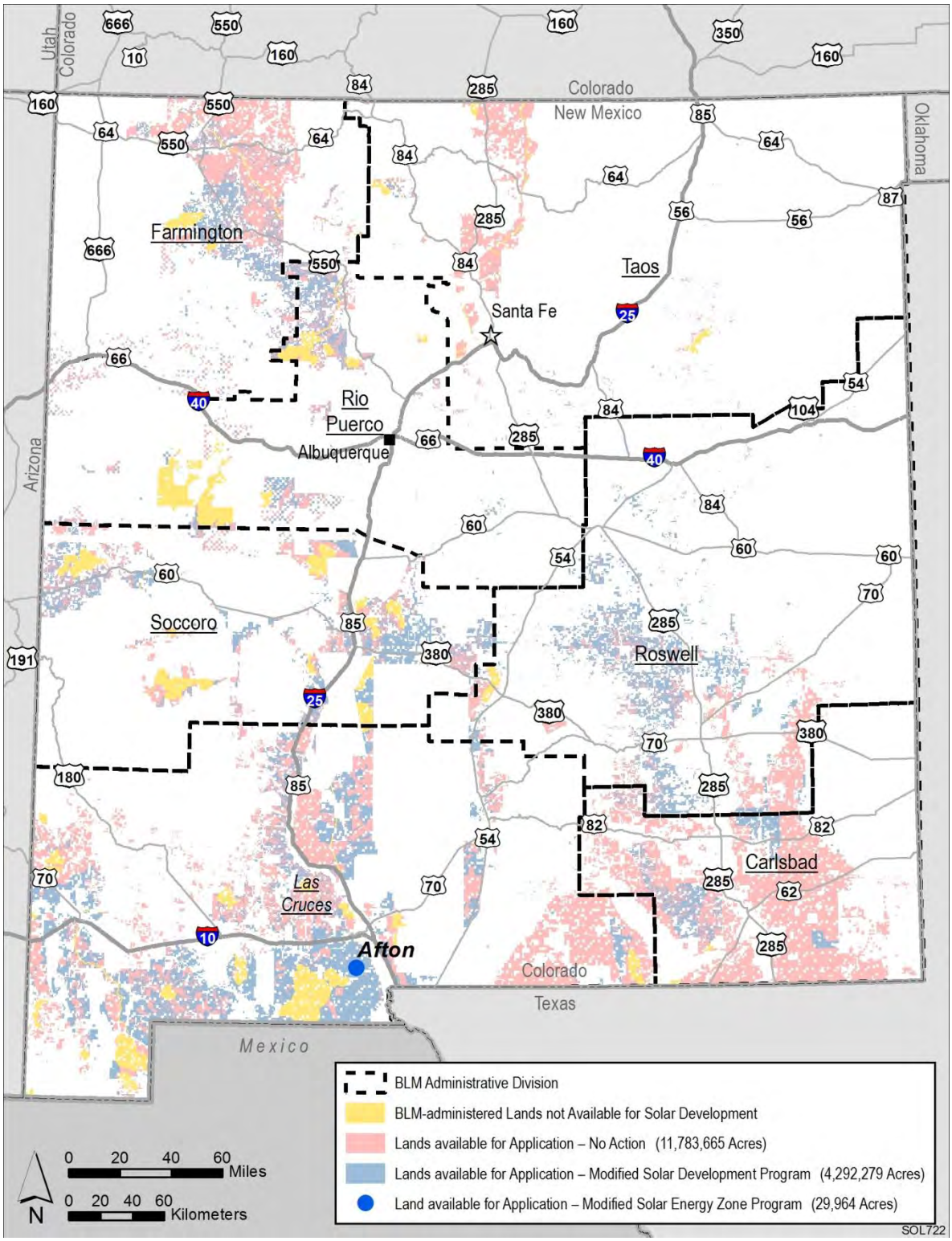

FIGURE 2.3-5 BLM-Administered Lands in New Mexico Available for Application for Solar Energy ROW Authorizations under the Modified BLM Alternatives Considered in this Supplement (Note: the lands available under the no action alternative include both the pink and blue shaded areas.)

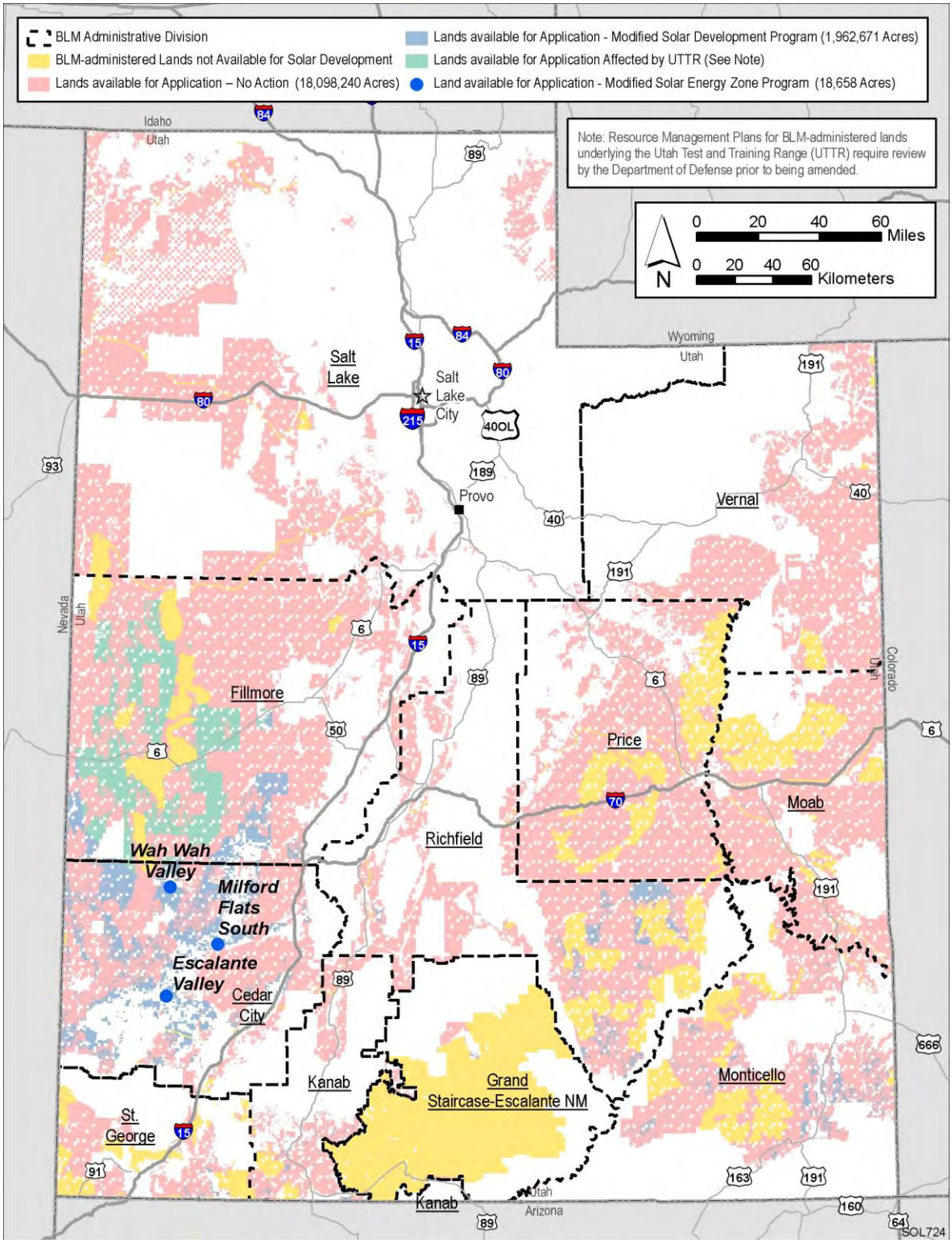

FIGURE 2.3-6 BLM-Administered Lands in Utah Available for Application for Solar Energy ROW Authorizations under the Modified BLM Alternatives Considered in this Supplement (Note: the lands available under the no action alternative include both the pink and blue shaded areas.)

Energy Policy Act of 2005 (Public Law [P.L.] 109-58) and Secretarial Order 3285A1 (Secretary of the Interior 2010) (see Section 1.1 of the Draft Solar PEIS), including, but not limited to, the mandate to identify and prioritize specific locations best-suited for utility-scale solar energy development on public lands, is also assessed.

In this section, summary-level information on the potential direct and indirect impacts on resources and resource uses from solar energy development is provided in the context of how such impacts would vary as a function of the modified action alternatives. Table 2.3-2 provides a summary of the environmental impacts of the modified alternatives. Commensurate with the planning-level decisions to be made (Section 1.5 of this Supplement), the impact summaries are primarily qualitative; however, to the extent practicable, some impacts have been quantified. While the impacts of solar development itself are largely similar across the modified action alternatives, differences between the alternatives are found in the location, pace, and concentration of this development.

The BLM has also revised Appendix J from the Draft Solar PEIS[1] –Special Status Species Associated with BLM's Alternatives in the Six-State Study Area." This document, which provides a comparison of species affected by alternative, can be obtained through the Solar PEIS project Web site (solareis.anl.gov).

This section incorporates by reference the Draft Solar PEIS assessment of the cumulative impacts of developing utility-scale solar energy on BLM-administered lands in the six-state study area over the next 20 years. The scope of the cumulative impact analysis in the Draft Solar PEIS was based on solar energy development at the level projected in the RFDS. As discussed in Section 1.6 of this Supplement, the RFDS remains a valid estimate of potential solar development over the next 20 years in the six-state study area. See Section 2.3.5 below for additional information on cumulative effects.

Discussion of the BLM's selection of a preferred alternative can be found in Section 2.3.4 of this Supplement. The discussion of other NEPA considerations (i.e., unavoidable adverse impacts, short-term uses of the environment and long-term productivity, irreversible and irretrievable commitment of resources, and mitigation of adverse effects) that was presented in the Draft Solar PEIS (Section 6.6) remains applicable to the modified action alternatives and is incorporated by reference from the Draft Solar PEIS.

[1] As described in the Reader's Guide for the Draft Solar PEIS, the need for an expanded species analysis by alternative was identified too late in preparation of the Draft Solar PEIS to be accommodated in the Draft version of the document. The BLM committed to updating Appendix J and making it available between the Draft and Final Solar PEIS. That work was completed and has subsequently been revised based on the changes proposed to the action alternatives through this Supplement. The revised document and additional details can be found at the Solar PEIS project Web site (solareis.anl.gov).

TABLE 2.3-2 Summary-Level Assessment of Potential Environmental Impacts by Alternative[a]

Resource	Modified Program Alternative (approximately 285,000 acres in priority areas) (approximately 20 million acres subject to variance process)	Modified SEZ Alternative (approximately 285,000 acres in priority areas)	No Action Alternative (approximately 98 million acres available for application)
Lands and Realty	Utility-scale solar energy development would preclude other land uses within the project footprint and could alter the character of largely rural areas. Development of supporting infrastructure (e.g., new transmission lines, roads) would also locally affect land use. These impacts potentially could be dispersed across the 20 million acres of variance areas; however, impacts would be minimized due to the required variance process. Design features (e.g., stakeholder coordination/consultation, consolidation of infrastructure) could effectively avoid or minimize many of these impacts.	Same impacts as modified program alternative, except impacts would be concentrated into a smaller, known geographic area.	Same impacts as modified program alternative, except impacts could be potentially more dispersed.
Specially Designated Lands and Lands with Wilderness Characteristics	Specially designated lands and lands with wilderness characteristics could be significantly affected through direct and indirect impacts (e.g., visual impacts, reduced access, noise impacts, fugitive dust) during both the construction and operations phases. Similar impacts potentially could be dispersed across the 20 million acres of variance areas; however, impacts would be minimized due to the required variance process and required design features. All National Landscape Conservation System (NLCS) lands would be excluded. Also excluded would be Areas of Critical Environmental Concern (ACECs), Special Recreation Management Areas (SRMAs) except in Nevada and portions of the Yuma East SRMA in Arizona; Desert Wildlife Management Areas (DWMAs); National Recreation Trails and National Backcountry Byways; National Historic and Scenic Trails, Wild, Scenic, and Recreational Rivers, and segments of rivers determined to be eligible or suitable for Wild and Scenic River status, and lands within the proposed Mojave Trails National Monument.[b] All areas where there is an applicable land use plan decision to protect lands with wilderness characteristics would be excluded	Same impacts as modified program alternative, except impacts would be concentrated into a smaller, known geographic area. This could increase the magnitude of potential impacts but affect a smaller number of areas.	Same impacts as modified program alternative, except that only NLCS lands currently off-limits to solar energy development would be excluded. Impacts could be potentially more dispersed and greater on specially designated lands and lands with wilderness characteristics excluded under the modified action alternatives.

TABLE 2.3-2 (Cont.)

Resource	Modified Program Alternative (approximately 285,000 acres in priority areas) (approximately 20 million acres subject to variance process)	Modified SEZ Alternative (approximately 285,000 acres in priority areas)	No Action Alternative (approximately 98 million acres available for application)
Rangeland Resources	Some livestock grazing allotments may be affected by solar energy development right-of-way (ROW) authorizations through reductions in acreage and/or loss of animal unit months (AUMs). Wild horses and burros also could be affected with animals displaced from the development area; the number of wild horse and burro herd management areas (HMAs) overlapping with or in the vicinity of lands available for ROW application would be less than under the no action alternative. These impacts potentially could be dispersed across the 20 million acres of variance areas; however, impacts would be minimized due to the required variance process and required design features.	Same impacts as modified program alternative, except impacts would be concentrated into a smaller geographic area within a known set of grazing allotments and HMAs.	Same impacts as modified program alternative, except impacts could be potentially more dispersed and there is less certainty about which grazing allotments and HMAs potentially could be affected.
Recreation	Recreational uses would be precluded within lands used for solar energy development. Recreational experiences could be adversely affected in areas proximate to solar energy projects and related transmission. These impacts potentially could be dispersed across the 20 million acres of variance areas; however, impacts would be minimized due to the required variance process and required design features. All SRMAs are excluded from solar energy development (except in Nevada and portions of the Yuma East SRMA in Arizona). Also excluded are developed recreational facilities and special-use permit recreation sites.	Same impacts as modified program alternative, except impacts would be concentrated into a smaller, known geographic area. This could increase the magnitude of potential impacts but affect fewer recreational resources.	Same impacts as modified program alternative, except SRMAs, recreational facilities, and special-use permit recreation sites not excluded. Impacts could be potentially more dispersed and greater on those recreational areas excluded under the action alternatives.

TABLE 2.3-2 (Cont.)

Resource	Modified Program Alternative (approximately 285,000 acres in priority areas) (approximately 20 million acres subject to variance process)	Modified SEZ Alternative (approximately 285,000 acres in priority areas)	No Action Alternative (approximately 98 million acres available for application)
Military and Civilian Aviation	Military and civilian aviation impacts would be identified and adequately mitigated prior to the Bureau of Land Management's (BLM's) issuance of a ROW authorization.	Same impacts as modified program alternative, except impacts would be concentrated into a smaller, known geographic area.	Same impacts as modified program alternative, except impacts could be potentially more dispersed.
Geologic Setting and Soil Resources	Development of large blocks of land for solar energy facilities and related infrastructure would result in impacts on geologic and soil resources in terms of soil compaction and erosion, although these impacts could be effectively mitigated. Impacts on biological soil crusts would be long term and possibly irreversible. These impacts potentially could be dispersed across the 20 million acres of variance areas; however, impacts would be minimized due to the required variance process and required design features.	Same impacts as modified program alternative, except impacts would be concentrated into a smaller, known geographic area.	Same impacts as modified program alternative, except impacts could be potentially more dispersed.
Mineral Resources	Mineral development within the project footprint for utility-scale solar energy development would generally be an incompatible use; however, some resources underlying the project area might be developable (e.g., directional drilling for oil and gas or geothermal resources, underground mining). These impacts potentially could be dispersed across the 20 million acres of variance areas; however, impacts would be minimized due to the required variance process and required design features. Lands within solar energy zones (SEZs) could be withdrawn from location and entry under the mining laws.	Same impacts as modified program alternative, except impacts would be concentrated into a smaller, known geographic area.	Same impacts as modified program alternative, except impacts could be potentially more dispersed. No SEZs would be identified or withdrawn.

TABLE 2.3-2 (Cont.)

Resource	Modified Program Alternative (approximately 285,000 acres in priority areas) (approximately 20 million acres subject to variance process)	Modified SEZ Alternative (approximately 285,000 acres in priority areas)	No Action Alternative (approximately 98 million acres available for application)
Water Resources	Solar thermal energy technologies with wet-cooling systems require large volumes of water, with potentially significant environmental impacts; however, such projects would be limited primarily to locations with ample groundwater supplies where water rights and the approval of water authorities could be obtained. Solar thermal projects with dry-cooling systems require less than one-tenth of the amount of water required for wet-cooling systems. All solar energy facilities require smaller volumes of water for mirror or panel washing and potable water uses, which would result in relatively minor impacts on water supplies. Other potential impacts, including modification of surface and groundwater flow systems, water contamination resulting from chemical leaks or spills, and water quality degradation by runoff or excessive withdrawals, can be effectively mitigated. Design features (e.g., minimizing water use, avoiding floodplains and ephemeral stream channels, measures for drainage and erosion control) could reduce many of these impacts.	Same impacts as modified program alternative, except impacts would be concentrated into a smaller, known geographic area. This could increase the magnitude of potential impacts but affect fewer water resources.	Same impacts as modified program alternative, except impacts could be potentially more dispersed.
Vegetation	Development likely to require total removal of vegetation at most facilities, which could result in significant direct impacts in terms of increased risk of invasive species introduction, changes in species composition and distribution, habitat loss (e.g., dune or riparian areas), and damage to biological soil crusts. Indirect impacts also likely in terms of dust deposition, altered drainage patterns, runoff, and sedimentation. Impacts potentially could be dispersed across the 20 million acres of variance areas; however, impacts would be minimized due to the required variance process.	Same impacts as modified program alternative, except impacts would be concentrated into a smaller, known geographic area. This could increase the magnitude of potential impacts but affect a smaller number of areas.	Same impacts as modified program alternative, except there would be no explicit exclusions to avoid known sensitive vegetation resources.

TABLE 2.3-2 (Cont.)

Resource	Modified Program Alternative (approximately 285,000 acres in priority areas) (approximately 20 million acres subject to variance process)	Modified SEZ Alternative (approximately 285,000 acres in priority areas)	No Action Alternative (approximately 98 million acres available for application)
Vegetation *(Cont.)*	Design features (e.g., invasive species control programs, fugitive dust control, minimizing size of disturbed areas) could significantly reduce impacts. Exclusions would avoid impacts in specific areas, including ACECs, Research Natural Areas, and Old Growth Forest. Less than 14% each of the Central Basin and Range and Chihuahuan Deserts Ecoregions, 11% of the Sonoran Basin and Range Ecoregion, and 5% of the Madrean Archipelago Ecoregion are located within the lands that would be available for application. Other ecoregions coincide with these lands at levels below 5%. The land cover types for the following example species overlap with variance areas available for ROW application by the percentage shown: Joshua tree – less than 7% Saguaro – less than 10%	Of the five ecoregions that coincide with SEZs, 1% or less of each ecoregion would be available for ROW application. Less than 1% of the land cover type for Joshua tree and saguaro species is located within the SEZs.	Impacts could be potentially more dispersed and greater on those vegetation resources excluded under the modified action alternatives. Lands available for ROW application span 22 ecoregions. More than 50% of 2 ecoregions (Central Basin and Range, Northern Basin and Range) would be available for application. The land cover types for the following example species overlap with the lands that would be available for ROW application by the percentage shown: Joshua tree – about 32% Saguaro – about 26%

TABLE 2.3-2 (Cont.)

Resource	Modified Program Alternative (approximately 285,000 acres in priority areas) (approximately 20 million acres subject to variance process)	Modified SEZ Alternative (approximately 285,000 acres in priority areas)	No Action Alternative (approximately 98 million acres available for application)
Wildlife and Aquatic Biota	Numerous wildlife species would be adversely affected by loss of habitat, disturbance, loss of food and prey species, loss of breeding areas, effects on movement and migration, introduction of new species, habitat fragmentation, and changes in water availability. Impacts potentially could be dispersed across the 20 million acres of variance areas; however, impacts would be minimized due to the required variance process. Design features (e.g., limiting land disturbance, conducting pre-disturbance surveys, controlling surface water runoff) could reduce many of these impacts. Exclusions would avoid such impacts in specific areas, including exclusion of ACECs, big game migratory corridors and winter ranges, Research Natural Areas, and lands with seasonal restrictions. The following example species' habitats overlap with variance areas for ROW application by the percentage shown: Western rattlesnake – less than 6% Golden eagle – less than 5% Black-tailed jackrabbit – less than 6% Pronghorn – less than 5% Mule deer – less than 6% Mountain lion – less than 5%	Same impacts as modified program alternative, except the potential area of impact would be limited to a smaller, known geographic area. Less than 1% of the habitats for western rattlesnake, golden eagle, black-tailed jackrabbit, pronghorn, mule deer, and mountain lion are located within the SEZs.	Same impacts modified program alternative, except there would be no explicit exclusions to avoid known sensitive wildlife resources. Impacts could be potentially more dispersed and greater on those wildlife resources excluded under the modified action alternatives. The following species' habitats overlap with the lands that would be available for ROW application by the percentage shown: Western rattlesnake – about 27% Golden eagle – about 23% Black-tailed jackrabbit – about 24% Pronghorn – about 22% Mule deer – about 22% Mountain lion – about 21%

TABLE 2.3-2 (Cont.)

Resource	Modified Program Alternative (approximately 285,000 acres in priority areas) (approximately 20 million acres subject to variance process)	Modified SEZ Alternative (approximately 285,000 acres in priority areas)	No Action Alternative (approximately 98 million acres available for application)
Special Status Species	Special status species and critical habitats would be protected in accordance with Endangered Species Act (ESA) requirements either through avoidance, translocation (plants), or acquisition and protection of compensatory habitat. Impacts potentially could be dispersed across the 20 million acres of variance areas; however, impacts would be minimized due to the required variance process. Critical habitat designated or proposed by the U.S. Fish and Wildlife Service (USFWS) would be excluded. All ACECs designated for habitat would be excluded along with identified Desert Tortoise translocation sites and other areas where the BLM has made a commitment to protect sensitive species (including Mohave ground squirrel and flat-tailed horned lizard habitat in California, greater sage-grouse habitat in California, Nevada, and Utah, and Gunnison's sage-grouse habitat in Utah). Variance areas for ROW application include areas of potentially suitable habitat for special status species (see revision to Appendix J of the Draft Solar PEIS at solareis.anl.gov). For example, the following species' habitats overlap by the percentage shown: Plants: Nevada dune beardtongue – less than 61% White-margined beardtongue – less than 8% Munz's cholla – less than 16% Animals: Desert tortoise – less than 12% Western burrowing owl – less than 8% Greater sage-grouse – less than 8%	Special status species and critical habitats would be protected as under modified program alternative. Lands available for ROW application within SEZs include areas of potentially suitable habitat for special status species (see Appendix J; available at the Solar PEIS project Web site [solareis.anl.gov]). For example, about 1% or less of the habitat for two plant species (Nevada dune beard tongue, white-margined beard tongue) and nine animal species (desert tortoise, western burrowing owl, greater sage-grouse, Gunnison prairie dog, Gunnison sage-grouse, northern aplomado falcon, and southwestern willow flycatcher, Townsend's big-eared bat, and Utah prairie dog) is located within the SEZs; less than 4% of the	Special status species and critical habitats would be protected as under modified program alternative. In some cases, habitat identified by state fish and game agencies would be excluded, as identified through applicable land use plan decisions. Critical habitat, ACECs designated for habitat value, and other areas where the BLM has made a commitment to protect sensitive species would not be excluded. Lands available for ROW application include areas of potentially suitable habitat for special status species (see Appendix J). For example, the following species' habitats overlap by the percentage shown:

TABLE 2.3-2 (Cont.)

Resource	Modified Program Alternative (approximately 285,000 acres in priority areas) (approximately 20 million acres subject to variance process)	Modified SEZ Alternative (approximately 285,000 acres in priority areas)	No Action Alternative (approximately 98 million acres available for application)
Special Status Species *(Cont.)*	Gunnison prairie dog – less than 3% Gunnison sage-grouse – less than 1% Northern aplomado falcon – less than 11% Southwestern willow flycatcher – less than 1% Townsend's big-eared bat – less than 7% Utah prairie dog – less than 12%	plant Munz's cholla habitats is located with the SEZs.	Plants: Nevada dune beardtongue – 66% White-margined beardtongue – 34% Munz's cholla – 45% Animals: Desert tortoise – 29% Western burrowing owl – 27% Greater sage-grouse – 54% Gunnison prairie dog – 15% Gunnison sage-grouse – 24% Northern aplomado falcon – 26% Southwestern willow flycatcher -- 7% Townsend's big-eared bat – 23% Utah prairie dog – 36%

TABLE 2.3-2 (Cont.)

Resource	Modified Program Alternative (approximately 285,000 acres in priority areas) (approximately 20 million acres subject to variance process)	Modified SEZ Alternative (approximately 285,000 acres in priority areas)	No Action Alternative (approximately 98 million acres available for application)
Air Quality and Climate	Air quality would be adversely affected locally and temporarily during construction by fugitive dust and vehicle emissions, although impacts would be relatively minor and could be mitigated (e.g., dust control measures, emissions control devices, and vehicle maintenance). Impacts potentially could be dispersed across the 20 million acres of variance areas; however, impacts would be minimized due to the required variance process and required design features. Operations would result in few air quality impacts. Relatively minor carbon dioxide (CO_2) emissions would be generated by the use of heavy equipment, vehicles, and backup generators. Overall, CO_2 emissions would be reduced if solar energy production offsets fossil fuel energy production.	Same impacts as modified program alternative, except impacts would be concentrated into a smaller, known geographic area. This could increase the magnitude of potential impacts, particularly during construction, but affect a smaller number of areas.	Same impacts as modified program alternative, except impacts could be potentially more dispersed and of smaller magnitude locally. Carbon dioxide emission reductions would occur more slowly if the pace of development is slower.
Visual Resources	Solar energy projects and associated infrastructure introduce strong contrasts in forms, line, colors, and textures of the existing landscape which may be perceived as negative visual impacts. Suitable development sites typically located in basin flats surrounded by elevated lands where sensitive viewing locations exist. Impacts potentially could be dispersed across the 20 million acres of variance areas; however, impacts would be minimized due to the required variance process. Design features could reduce impacts but some large impacts cannot be avoided.	Same impacts as modified program alternative, except the impacts would be concentrated into a smaller, known geographic area. This could increase the magnitude of potential impacts, particularly during construction, but affect a smaller number of areas.	Same impacts as modified program alternative, except that only NLCS lands would be excluded. Impacts could be potentially more dispersed and greater on those areas excluded under the modified action alternatives.

TABLE 2.3-2 (Cont.)

Resource	Modified Program Alternative (approximately 285,000 acres in priority areas) (approximately 20 million acres subject to variance process)	Modified SEZ Alternative (approximately 285,000 acres in priority areas)	No Action Alternative (approximately 98 million acres available for application)
Visual Resources (*Cont.*)	All NLCS lands and ACECs are excluded. All SRMAs are excluded (except in Nevada and portions of the Yuma East SRMA in Arizona). Developed recreational facilities, special-use permit recreation sites, National Recreation Trails, and National Backcountry Byways are excluded. Less than 902 potentially sensitive visual resource areas (not including ACECs) are located in or within 25 mi (40 km) of the lands available for ROW viewsheds.	SEZs are visible from less than 149 potentially sensitive visual resource areas (not including ACECs) within 25 mi.	About 1,510 potentially sensitive visual resource areas (not including ACECs) are located in or within 25 mi of the lands available for ROW application and could be affected by solar development within their viewsheds.
Acoustic Environment	Construction-related noise could adversely affect nearby residents and/or wildlife, and would be greatest for concentrating solar power projects requiring power block construction. Operations-related noise impacts would generally be less significant than construction related noise impacts but could still be significant for some receptors located near power block or dish engine facilities. Impacts potentially could be dispersed across the 20 million acres of variance areas; however, impacts would be minimized due to the required variance process. Design features (e.g., siting, engineering controls) would significantly reduce impacts in some circumstances.	Same impacts as modified program alternative, except impacts would be concentrated into a smaller, known geographic area. This could increase the magnitude of potential impacts, particularly during construction, but affect a smaller number of areas.	Same impacts as modified program alternative, except impacts could be potentially more dispersed.
Paleonto-logical Resources	Paleontological resources subject to loss during construction, but impacts also possible during operations. Impacts potentially could be dispersed across the 20 million acres of variance areas; however, impacts would be minimized due to the required variance process. Design features would significantly reduce impacts.	Same impacts as modified program alternative, except impacts would be concentrated into a smaller, known geographic area.	Same impacts as modified program alternative, except impacts could be potentially more dispersed.

TABLE 2.3-2 (Cont.)

Resource	Modified Program Alternative (approximately 285,000 acres in priority areas) (approximately 20 million acres subject to variance process)	Modified SEZ Alternative (approximately 285,000 acres in priority areas)	No Action Alternative (approximately 98 million acres available for application)
Cultural Resources and Native American Concerns	Cultural resources subject to loss during construction, but impacts also possible during operations. Impacts potentially could be dispersed across the 20 million acres of variance areas; however, impacts would be minimized due to the required variance process. Design features (e.g., minimizing land disturbance, consultation and records searches, and training and education programs) would significantly reduce some impacts.	Same impacts as modified program alternative, except impacts would be concentrated into a smaller, known geographic area.	Same impacts as modified program alternative, except there would be no explicit exclusions to avoid known sensitive cultural resources.
	ACECs designated for cultural or historic resource values, National Historic and Scenic Trails, National Historic and Natural Landmarks, properties designated or eligible for the *National Register of Historic Places,* and areas with important cultural and archaeological resources would be excluded.	Same exclusions as modified program alternative	Impacts could be potentially more dispersed and greater on those cultural resources excluded under the modified action alternatives.
Transportation	Local road systems and traffic flow could be adversely affected during construction. Impacts during operations would be minor. Impacts potentially could be dispersed across the 20 million acres of variance areas; however, impacts would be minimized due to the required variance process. Design features (e.g., road improvements, ride-sharing programs, staggered work schedules, and traffic control measures) would significantly reduce impacts.	Same impacts as modified program alternative, except impacts would be concentrated into a smaller, known geographic area. This could increase the magnitude of potential impacts, particularly during construction, but affect a smaller number of areas.	Same impacts as modified program alternative, except impacts could be potentially more dispersed.

[a] The precise habitat overlap values (percentage) for the modified program alternative and modified SEZ alternative lands with specific habitats will be presented in the Final Solar PEIS. The lands composing the no action alternative have not changed significantly since release of the Draft Solar PEIS; thus the habitat overlap values (percentage) presented remain valid. To convert acres to km^2, multiply by 0.004047; to convert mi to km, multiply by 1.609.

[b] The acreage estimates were calculated on the basis of the best available geographic information system (GIS) data. GIS data were not available for the entire set of exclusions, and therefore, the acreages cannot be quantified at this time.

2.3.1 Impacts of the Modified Solar Energy Development Program Alternative

As discussed, all BLM-administered lands are not appropriate for solar energy development. Under the modified solar energy development program alternative (referred to as "modified program alternative"), certain categories of land that are known or believed to be unsuitable for utility-scale solar development would be excluded from development to guide solar energy developers to areas where there are fewer resource conflicts and potential controversy. Changes in proposed exclusions are presented in this Supplement. These changes reflect new information and comments received on the Draft Solar PEIS. The changes in exclusions are presented in Table 2.2-1 of this Supplement. On the basis of these exclusions, approximately 78 million acres (315,655 km^2) of BLM-administered lands that would otherwise be eligible for utility-scale solar energy development would be excluded from such development under this alternative. A subset of the remaining modified program alternative lands, approximately 285,000 acres (1,153 km^2), would be identified as SEZs where the agency would prioritize solar energy and associated transmission infrastructure development.[2]

Under the modified program alternative, all remaining BLM-administered lands outside of exclusion areas and SEZs would be identified as variance areas for utility-scale solar energy development. Variance areas would be open to application but would require developers to adhere to the variance process detailed in this Supplement (see Section 2.2.2.3.1).

The modified program alternative would also establish comprehensive program administration and authorization policies and design features to be applied to utility-scale solar energy projects that are issued ROWs on BLM-administered lands in the six-state study area. The proposed program administration and authorization policies have been updated as part of this Supplement. Proposed design features are presented in Section A.2 of Appendix A of the Draft Solar PEIS and will be modified, as necessary, in the Final Solar PEIS. As part of this alternative, the BLM would also establish SEZ-specific design features to address SEZ-specific resource conflicts. These SEZ-specific design features are based on the in-depth analyses of SEZs being conducted as part of the Solar PEIS. The elements of the BLM's new program under this alternative would be implemented through the amendment of the land use plans within the six-state study area and other applicable policy making tools.[3]

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[2] As discussed in Section 2.2.2.2, in the future, the BLM will conduct periodic assessment of need related to SEZs and may decide to expand SEZs, add SEZs, or remove or reduce SEZs. Changes to SEZs would have to go through a land use planning process, which would be subject to the appropriate environmental analysis.

[3] Under this alternative, most of the land use plans in the six-state study area would be amended. Section 2815(d) of the National Defense Authorization Act for Fiscal Year 2000 (P.L. 106-65) placed a moratorium on planning efforts on BLM-administered lands "adjacent to, or near the Utah Test and Training Range (UTTR) and Dugway Proving Grounds or beneath Military Operating Areas, Restricted Areas, and airspace that make up the UTTR" (NDAA § 2815(a), 113 Stat. 512, 852 [1999]). This area encompasses a portion of the lands within the boundaries of the Box Elder, Pony Express, House Range, Warm Springs, and Pinyon land use plans. Within these areas, decisions related to whether lands would be available for ROW application, and adoption of the policies and design features of the PEIS, cannot be implemented via land use plan amendments at this time. Solar energy development ROW applications would be deferred until such time when plan amendments or new land use plan(s) address solar energy development. No SEZs are located within the UTTR affected areas.

Under the modified program alternative, individual ROW applications would continue to be evaluated on a project-by-project basis; however, the BLM proposes that these evaluations would tier to the programmatic analyses presented in the Solar PEIS and the decisions implemented in the resultant ROD and land use plan amendments to the extent appropriate. Site- and project-specific data would be assessed in the individual project reviews, and impacts not adequately mitigated by the program's administration and authorization policies and design features would be addressed through the implementation of additional mitigation requirements incorporated into the project POD and ROW authorization stipulations. Analysis of an application may result in a decision to deny the application.

As an element of the proposed program, the BLM would implement an adaptive management and monitoring plan for solar energy development developed in coordination with potentially affected natural resource management agencies, to ensure that new data and lessons learned about the impacts of solar energy projects would be reviewed and, as appropriate, incorporated into the program through revised policies and design features (see Section 2.2.1.2 of this Supplement). Changes to the BLM's Solar Energy Program will be subject to appropriate environmental analysis and land use planning.

The following subsections discuss the effectiveness of the modified program alternative in meeting the BLM's established program objectives and describe the potential environmental impacts of the alternative.

2.3.1.1 Facilitate Near-Term Solar Energy Development (Pace of Development)

Under the modified program alternative, the BLM would establish a set of programmatic administration and authorization policies and design features that would facilitate development by establishing a clear, consistent, and unambiguous process and set of conditions for utility-scale solar energy development on BLM-administered lands. A number of program elements would contribute to these efficiencies, as follows:

- By excluding lands with known sensitive resources, resource uses, and special designations, the agency would accept ROW applications for utility-scale solar energy development only where such development may be expected to encounter fewer potential resource conflicts. Time and effort would be directed to those projects that have a greater chance of success. Review of projects proposed within any of the proposed SEZs would be further streamlined, because these areas have undergone intensive site-specific analyses as part of the Solar PEIS and mitigation has been proposed for identified resource conflicts.

- The identification of variance areas for utility-scale solar energy development and the associated variance process detailed in this Supplement is expected to help applicants formulate projects outside of SEZs that have a greater chance for success. Evaluation of projects through the proposed variance process will require upfront effort on the part of the BLM and applicants. BLM staff will

be required to coordinate with federal, state, Tribal, and local stakeholders and evaluate site-specific resource conflicts as part of the variance application analysis process.

- To the extent that decisions about future solar energy projects could be tiered to the analyses in the Solar PEIS or decisions in the resultant ROD, project review and approval time lines would be shortened. The proposed program administration and authorization policies and design features are comprehensive and address the majority of operational and design requirements for most projects. The universe of issues that would be evaluated in detail at the project level would be reduced to site-specific and species-specific issues and concerns. For some of the SEZs, it is expected that with the additional data collection proposed in this Supplement and the implementation of required design features, development could proceed with limited additional environmental analysis.[4]

- Amending the land use plans within the six-state study area to implement the new program would facilitate individual project approvals and would ensure that multiple individual plan amendments would not be required.

It is anticipated that these program elements would collectively reduce the amount of time and resources required to obtain ROW authorizations and would speed up the pace of utility-scale solar energy development in the six-state study area without compromising the level of protection for natural and cultural resources. Shortened development time lines, particularly for projects proposed within SEZs, would reduce the cost to the government, developers, and stakeholders. These outcomes would likely increase the agency's ability to meet the mandates of the Energy Policy Act of 2005 and Secretarial Order 3285A1 (Secretary of the Interior 2010).

2.3.1.2 Minimize Environmental Impacts

Utility-scale solar energy facilities are industrial facilities that require large tracts of land and can cause substantial impacts on a variety of natural and cultural resources. Proper consultation, siting and design, and application of mitigation measures can avoid, minimize, or mitigate many of these impacts. The proposed program administration and authorization policies updated as part of this Supplement and the required design features under the modified program alternative would ensure that potential environmental impacts are addressed thoroughly and consistently for all utility-scale solar energy projects on BLM-administered lands. Specific program elements have been developed to address the many aspects of managing environmental impacts, as follows:

- The proposed program administration and authorization policies establish requirements for coordination and/or consultation with other federal and state

[4] For all proposed SEZs, government-to-government consultation and interagency consultation are still ongoing and could result in the identification of additional concerns.

agencies and for government-to-government consultation, and establish requirements for public involvement. Collectively, these policies ensure that all projects are thoroughly reviewed; input is collected from all potentially affected federal, state, Tribal, and local stakeholders; and any project proposals that are anticipated to result in unacceptable adverse impacts are eliminated early in the application process.

- The proposed ROW exclusions would avoid impacts of utility-scale solar energy development on known sensitive resources, resource uses, and specially designated areas. Projects on variance areas would be thoroughly reviewed through the proposed variance process to ensure that only the most appropriate applications are processed. BLM staff will be required to coordinate with federal, state, Tribal, and local stakeholders and evaluate site-specific resource conflicts as part of the variance application analysis process. Analysis of an application may result in a decision to deny the application.

- By restricting utility-scale development to lands with slopes less than or equal to 5%, the BLM would effectively limit development to those BLM-administered lands currently assumed to be the best suited with respect to technology limitations. By restricting development to lands with solar insolation levels greater than or equal to 6.5 kWh/m^2/day, the BLM would be making available those lands where utility-scale development is assumed to be most economically viable. These proposed restrictions will facilitate the efficient use of BLM-administered lands and enhance the BLM's ability to fulfill the multiple-use mandate of FLPMA by reserving for other uses lands that are not well suited for solar energy development.

- The proposed design features, developed on the basis of extensive impact analyses conducted in the Solar PEIS, address the full array of potential impacts associated with each phase of development (i.e., site evaluation, construction, operation, and decommissioning). For many project locations, the majority of potential impacts would be addressed by these requirements. Individual project environmental reviews would be required to address any additional site-specific and species-specific issues and concerns.

- The proposed variance process would provide flexibility to industry to request utility-scale solar development projects outside of SEZs in areas determined to be economically and technically viable. However, the variance process has been designed to ensure that only those applications that can demonstrate that environmental impacts are minimized will be processed by the BLM.

- By allowing appropriate development in variance areas, the BLM would provide opportunities to site solar energy projects on lands that have been previously disturbed.

- The prioritization of development in SEZs could limit some environmental impacts. These areas were selected as lands well suited for utility-scale solar development (i.e., lands with fewer potential resource conflicts). Although some potentially significant resource and resource use conflicts have been discovered for some SEZs, SEZ-specific design features have been identified to address those potential impacts. The concentration of development in the SEZs could also allow for the consolidation of related infrastructure (e.g., roads, transmission lines) and less total land disturbance.

- Forthcoming adaptive management and monitoring strategies would ensure that new data and lessons learned about the impacts of solar energy development are incorporated into future programmatic and project-specific requirements. At the project level, developers would be required to develop monitoring programs in coordination with the BLM to evaluate the environmental conditions at the site through all phases of development, to establish metrics against which monitoring observations could be measured, to identify potential mitigation measures, and to establish protocols for incorporating monitoring observations and new mitigation measures into standard operating procedures.

- Implementing a comprehensive program would allow the BLM to better assess potential cumulative impacts of solar energy development across the six-state study area over time.

- A program that would facilitate solar energy development on BLM-administered lands (as compared to private lands) would ensure that the development would be subjected to rigorous environmental review, including a thorough public involvement process.

Table 2.3-2 includes a summary of the environmental impacts associated with solar energy development under this alternative and the ways in which the impacts would be mitigated by the programmatic exclusions, policies, and design features. As reflected in that table, for several resource and impact areas, implementation of the proposed design features is expected to ensure that impacts would be negligible or minor. For certain resource areas (e.g., hazardous materials and waste, health and safety), there are few, if any, unique site- or project-specific issues that would not be fully addressed by the programmatic requirements. For other resource areas (e.g., lands and realty, rangeland resources, military and civilian aviation, geologic setting and soils, mineral resources, air quality, acoustic environment, paleontological resources, and transportation), the programmatic requirements are comprehensive and broad enough to address most issues even though there could be some site- and project-specific variables. For example, although paleontological resources vary in occurrence and density by site, impacts on these resources can be mitigated and the design feature requiring a paleontological resources management plan would ensure that potential impacts are identified and addressed. Similarly, although traffic patterns and local road use vary by location, the design features requiring development of a transportation plan and traffic management plan would ensure that local issues are identified and addressed.

For other resource and impact areas, the full effectiveness of the proposed design features intended to reduce potential impacts can be assessed only through the additional project-specific analyses that would be required under the proposed program. These areas include specially designated areas and lands with wilderness characteristics, recreation, water resources, vegetation, wildlife and aquatic biota, special status species, visual resources, cultural resources, Native American concerns, and environmental justice. For example, the magnitude of potential impacts of a given project on water resources would depend on project-specific parameters and site-specific conditions. The water requirements would depend on the size of the project and the technology used (e.g., concentrating solar power versus PV, wet cooling versus dry cooling systems). The nature of the impacts would depend on the amount of locally and regionally available water resources; the source of water supply; and other water uses, including requirements to support sensitive species and/or their critical habitats. These types of impacts cannot be assessed fully until project and site specific information is known.

BLM's intent in identifying SEZs has been to find areas well suited to utility-scale solar energy production, with few impediments to solar facility construction and operation, where the BLM would prioritize solar energy and associated transmission infrastructure development. In identifying the SEZs evaluated in the Draft Solar PEIS, the BLM targeted areas with low slope, near existing transmission or designated corridors and near existing roads, and with a minimum area of 2,500 acres (10 km^2). The BLM also excluded from the SEZs National Landscape Conservation System (NLCS) lands and other sensitive classes of lands (e.g., critical and sensitive habitat, Areas of Critical Environmental Concern (ACECs), no surface occupancy areas, wilderness characteristic areas, ROW exclusion and avoidance areas from applicable land use plans, National Historic and Scenic Trails, areas of Tribal concern, and the like).[5]

Through the in-depth SEZ analyses completed as part of the Draft Solar PEIS and additional evaluation performed for this Supplement, the BLM has discovered some potentially significant impacts on various resources and resource uses that could result from solar energy development in the SEZs as proposed in the Draft Solar PEIS. This information was used to eliminate some of the SEZs, reduce the area of some other SEZs, and identify non-development areas within some SEZs under the modified program alternative described in this Supplement (see Section 2.2.2.2 and Appendix C of this Supplement). In addition, the implementation of programmatic policies and design features required as part of the modified program alternative would help to minimize environmental impacts in the SEZs. The BLM has also proposed SEZ-specific design features that would further avoid and/or minimize potential impacts in these areas. These additional requirements could result in more reductions in the amount of developable land within some SEZs that would be identified during project-specific investigations.

Utility-scale solar energy development could result in reduced emissions of greenhouse gases (GHGs) and combustion-related pollutants, if the development offsets electricity

[5] Although these classes of lands should have been excluded from the proposed SEZs, some may not have been because of incomplete information on the locations of these areas and incomplete GIS data. Additional applicable non-developable areas of SEZs may be identified during project-specific investigations when additional data have been collected.

generation by fossil fuel power plants. As discussed in Section 2.3.1.1, the pace of solar energy development is expected to be faster under this alternative, compared to the current pace, and therefore the potential beneficial impacts of reduced GHG emissions may be realized at a faster rate.

As a result of these considerations, the BLM anticipates that by implementing the proposed program administration and authorization policies and design features, the agency would maximize its ability to effectively identify and avoid, mitigate, or minimize potential adverse environmental impacts.

2.3.1.3 Minimize Social and Economic Impacts

Utility-scale solar energy development under this alternative is expected to result primarily in economic benefits in terms of both jobs and income created. These benefits would occur as both direct impacts, resulting from the wages and salaries, procurement of goods and services, and collection of state sales and income taxes, and indirect impacts, resulting from new jobs, income, expenditures, and tax revenues subsequently created as the direct impacts circulate through the economy. These benefits occur during both the construction and operations phases, with the construction phase benefits being temporary and the operations phase benefits being more long term. The specific benefits vary by technology, because some technologies generate more jobs than other technologies. For example, a 100-MW parabolic trough facility would create 350 new direct construction jobs and 43 new direct operations jobs, whereas a PV facility of comparable generation capacity would create 30 new direct construction jobs and very few direct operations jobs (see Tables 5.17.2-1 through 5.17.2-4 in the Draft Solar PEIS for detailed information about the economic impacts of construction and operation of solar energy facilities by technology type).[6] The benefits in terms of indirect jobs and total income also vary by state, because the extent of in-state spending and economic multiplier effects vary by state.

Because utility-scale solar energy development would be accompanied by transmission system development and new access road construction in many locations, potential economic benefits also result from the direct and indirect jobs associated with this infrastructure construction. These impacts are discussed in Section 5.17.1.2 of the Draft Solar PEIS.

The BLM would incur agency-related costs associated with developing, implementing, and managing solar energy development on BLM-administered lands. However, under the BLM's ROW program, which is a cost-recovery program, a substantial portion of the costs for processing ROW applications, including environmental review requirements, would be paid for by developers. In addition, the federal government will collect income from ROW rental payments, which include an acreage component and capacity fee component. As discussed in Section 2.2.2.2.1 in this Supplement, the BLM has confirmed that it will offer lands within SEZs through a competitive process. This would result in increased revenue to the federal government. A competitive process, however, could increase costs for developers of solar facilities.

6 The estimate provided in the text here for number of PV construction jobs is based on an extrapolation of data in Table 5.17.2-4 of the Draft Solar PEIS.

As discussed in Section 5.17.1.1 of the Draft Solar PEIS, there would be some adverse economic impacts on displaced public land users associated with solar development (e.g., loss of grazing allotments). There may also be adverse social impacts resulting from changes in recreation, property values, and environmental amenities (e.g., environmental quality, rural community values, or cultural values). There could also be beneficial social impacts associated with solar development resulting from economic growth and a positive reception to the presence of a renewable energy industry. At the programmatic level, it is difficult to quantify these impacts.

2.3.1.4 Provide Flexibility to Solar Industry

As compared to the modified SEZ alternative, the modified program alternative provides a great degree of flexibility to developers in identifying appropriate locations for utility-scale development (i.e., economically attractive locations with minimal environmental or cultural resource conflicts), by identifying lands outside of exclusion areas and SEZs as variance areas with an associated variance process.

Concerns exist that by excluding lands with slopes greater than 5% and with solar insolation levels below 6.5 kWh/m^2/day, the BLM could be removing lands that some developers may find both technically and economically feasible to pursue in the future. The BLM's proposed SEZ identification protocol takes this concern into account and would allow future SEZs to be located in these excluded areas if factors have changed such that these areas become technologically and economically viable for utility-scale solar energy development, and provided that the areas are otherwise well suited for development (see Appendix D, Sections D.2.2 and D.2.3).

2.3.1.5 Optimize Existing Transmission Infrastructure and Corridors

The proposed variance process will allow developers to identify and propose projects that utilize existing transmission infrastructure and designated transmission corridors. Further, the BLM's proposed SEZ identification protocol (see Appendix D, Section D.2.5, of this Supplement) will consider proximity to existing infrastructure such as transmission lines and corridors. The BLM will catalog the existing and proposed transmission lines in relation to the power generation from a proposed SEZ location. The BLM will also consult with state and regional transmission planning and coordination authorities, state energy offices, and transmission system operators to evaluate available capacity on the existing and proposed lines and whether transmission access issues might create barriers to development in a specific area.

Although it is likely that most new utility-scale solar energy development will require new transmission capacity, projects that can be located near existing transmission lines would likely result in fewer environmental impacts associated with connecting to and upgrading the existing lines. Similarly, solar projects that utilize existing corridors would result in reduced environmental impacts, assuming the corridor designation process factored potential

environmental and other siting concerns into the corridor alignment. The use of existing transmission infrastructure and corridors could also reduce cost, time, and controversy.

2.3.1.6 Standardize and Streamline the Authorization Process

The modified program alternative would standardize requirements and reduce uncertainty for project applications. It would streamline project review and approval processes, and ensure consistency in the way utility-scale ROW applications are managed. Individual ROW applications would continue to be evaluated on a project-by-project basis; however, the BLM proposes that these evaluations would tier to the programmatic analyses presented in the Solar PEIS and the decisions implemented in the resultant ROD and land use plan amendments to the extent appropriate.

2.3.1.7 Meet Projected Demand for Solar Energy Development

On the basis of the RFDS for solar energy development (which is assumed to be the same for each alternative), the estimated amount of solar energy generation on BLM-administered lands in the study area over the 20-year study period (through approximately 2030) is about 24,000 MW, with a corresponding dedicated use of about 214,000 acres (866 km^2) of BLM-administered lands. The comparison of the area projected to be needed for solar development under the RFDS with the revised lands available for application under the two BLM action alternatives is presented in Table 2.3-3. Under the modified program alternative, the land area needed to meet the estimated RFDS for solar development (about 214,000 acres [866 km^2]) would be only about 1% of the land area available for application (about 20 million acres [82,964 km^2] of variance lands) and about 75% of the land area available for development within SEZs (285,000 acres [1,153 km^2]). Thus, the modified program alternative meets the projected demand for solar energy development.

2.3.2 Impacts of the Modified SEZ Program Alternative

Under the modified SEZ program alternative (referred to as ~~"m~~odified SEZ alternative"), the BLM would adopt the same set of standard program administration and authorization policies and design features for utility-scale solar energy development as proposed under the modified program alternative, but would authorize such solar energy development only in SEZs. Unlike the modified program alternative, lands outside of SEZs would be excluded from utility-scale solar energy ROW applications. Under this alternative, about 285,000 acres (1,153 km^2) of BLM-administered lands would be available for ROW applications. As part of this Supplement, the BLM has proposed a protocol to identify new SEZs (see Appendix D). Per the proposed protocol, new SEZs would be relatively large areas that provide highly suitable locations for utility-scale solar development: locations where solar development is economically and technically feasible, where there is good potential for connecting new electricity-generating plants to the transmission distribution system, and where there is generally low resource conflict. The identification of new SEZs would have to go through a land use planning process and would be subject to the appropriate environmental analysis.

TABLE 2.3-3 Percentage of Available Lands Developed under BLM Modified Action Alternatives Based on Estimated Acres Developed under the RFDS[a]

State	Estimated Acres[b] Developed under RFDS[c]	Modified Program Alternative: Total Proposed Acres Available[d]	Modified Program Alternative: Percentage Developed under RFDS	Modified SEZ Alternative: Total Proposed Acres Available[e]	Modified SEZ Alternative: Percentage Developed under RFDS
Arizona	21,816	3,397,007 (4,485,944)	0.6 (0.5)	6,465 (13,735)	100[f] (100)
California	138,789	1,354,559 (1,766,543)	10.0 (7.9)	153,627 (339,090)	90.3 (40.9)
Colorado	19,746	111,059 (148,072)	17.8 (13.3)	16,308 (21,050)	100[f] (93.8)
Nevada	15,309	9,207,288 (9,084,050)	0.2 (0.2)	60,395 (171,265)	25.4 (8.9)
New Mexico	7,497	4,292,279 (4,068,324)	0.2 (0.2)	29,964 (113,052)	25.0 (6.6)
Utah	10,971	1,962,671 (2,028,222)	0.6 (0.6)	18,658 (19,192)	58.8 (57.2)
Total	214,128	20,324,863 (21,581,154)	1.1 (1.0)	285,417 (677,384)	75.0 (31.6)

[a] Values in parentheses are values from the Draft Solar PEIS, provided for comparison.

[b] To convert acres to km^2, multiply by 0.004047.

[c] See Table 2.4-1 of the Draft Solar PEIS for the basis for these estimates.

[d] See Section 2.2.2.2 of the Draft Solar PEIS for the basis for these estimates.

[e] See Section 2.2.2.3 of the Draft Solar PEIS for the basis for these estimates. For the purpose of the RFDS estimates of development, the entire acreage is used in the calculation of percentage developed; however, some portion will not be developable because of various restrictions.

[f] The estimated number of acres developed based on the RFDS projection exceeds the acreage proposed to be available in Arizona and Colorado under the modified SEZ alternative; thus it is assumed that 100% of the SEZs would be developed over the 20-year time line assessed in the Solar PEIS.

Under the modified SEZ alternative, the management of solar energy development on BLM-administered lands would be the same as described for the modified program alternative. The BLM would establish comprehensive program administration and authorization policies and design features as part of this alternative. The elements of the BLM's new program under this alternative would be implemented through amendment of the land use plans within the six-state study area and other applicable policy-making tools.

The following subsections discuss the effectiveness of the modified SEZ alternative in meeting the BLM's established program objectives and describe the potential environmental impacts of the alternative.

2.3.2.1 Facilitate Near-Term Solar Energy Development (Pace of Development)

The impacts on the pace of development under the modified SEZ alternative would be much the same as those described for the modified program alternative in Section 2.3.1.1; although it is possible that the modified SEZ alternative could speed up the pace of development even further. Elements of the authorization process and incentives for projects in SEZs described in this Supplement (Section 2.2.2.2) would reduce the amount of time and resources required to obtain ROW authorizations, which would translate into reduced costs to government, developers, and stakeholders. As with the modified program alternative, these outcomes would likely increase the agency's ability to meet the mandates of the Energy Policy Act of 2005 and Secretarial Order 3285A1 (Secretary of the Interior 2010).

2.3.2.2 Minimize Environmental Impacts

Similar to the modified program alternative, environmental impacts under the modified SEZ alternative would be minimized in the following ways:

- Government-to-government consultation and public input would ensure thorough review of the proposed locations of development within SEZs.

- Because the developable land area for utility-scale solar energy development would be restricted to SEZs, known sensitive resources would be avoided for the most part, SEZ-specific design features would protect any sensitive resources identified in SEZs, and uncertainty of the distribution of impacts, including possible fragmentation of habitat, would be reduced.

- The proposed program design features and SEZ-specific design features would address the full array of potential impacts associated with each phase of development.

- The concentration of development in the SEZs could allow for the consolidation of related infrastructure (e.g., roads, transmission lines) and less total land disturbance.

- The requirement to implement adaptive management and monitoring strategies would ensure that mitigation measures would be implemented if unforeseen impacts were identified during project planning, construction, or operations.

- Because of the proximity of solar development projects that could occur under the SEZ program alternative, cumulative impacts for some resources (e.g., water, visual, and socioeconomics) in localized areas around the SEZs could be high; however the certainty of this location may allow these impacts to be more easily addressed. An analysis of the potential cumulative impacts for each SEZ was included in Chapters 8 through 13 of the Draft Solar PEIS and will be updated as necessary for the Final Solar PEIS.

By making only about 285,000 acres (1,153 km^2) of land available for ROW application, the BLM would limit opportunities to site solar energy projects on lands that have been previously disturbed. However, the BLM's proposed protocol to identify new SEZs emphasizes the use of disturbed or previously disturbed areas, including partnerships with nonfederal landowners or administrators (see Appendix D of this Supplement).

Table 2.3-2 summarizes the environmental impacts that might be associated with solar energy development under the modified SEZ alternative and the extent to which the impacts would be mitigated by the programmatic exclusions, policies, and design features. As reflected in that table, it is not possible to fully assess the impacts on some resources (e.g., specially designated areas and lands with wilderness characteristics, recreation, military aviation, water resources, vegetation, wildlife and aquatic biota, special status species, visual resources, cultural resources, Native American concerns, and environmental justice), because they are dependent on specific project details not defined at the programmatic level. However, this type of analysis would be conducted thoroughly through additional project-specific analyses that would be required under the proposed program.

Through the SEZ-specific analyses completed as part of the Draft Solar PEIS and additional evaluation performed for this Supplement, the BLM has discovered some potentially significant impacts on various resources and resource uses that could result from solar energy development in the SEZs as proposed in the Draft Solar PEIS. The modifications to the SEZs under the modified SEZ alternative proposed in this Supplement (i.e., dropping SEZs from further consideration, reducing the area of other SEZs, and identifying non-development areas within SEZs), along with implementation of program administration and authorization policies and design features as part of this alternative, would minimize environmental impacts of development in the SEZs. The BLM has also proposed SEZ-specific design features that would further avoid and/or minimize potential impacts in these areas. These additional requirements could result in more reductions in the amount of developable land within some SEZs that would be identified during project-specific investigations.

The BLM anticipates that by implementing the proposed policies and design features identified in the Solar PEIS, the agency would maximize its ability to effectively identify and avoid, mitigate, or minimize potential adverse environmental impacts.

2.3.2.3 Minimize Social and Economic Impacts

The potential socioeconomic impacts of the modified SEZ alternative would be similar to those described for the modified program alternative; however, both the economic benefits and the potential adverse economic and social impacts would be concentrated solely in the vicinity of the SEZs.

The BLM's efforts to oversee utility-scale solar energy development in the six-state study area would be streamlined under the SEZ program alternative by virtue of the smaller geographic area and the opportunities for tiering to the SEZ-specific analyses provided in the Solar PEIS. In addition to receiving ROW rental payments, the BLM has confirmed that it will offer lands within SEZs through a competitive process (see Section 2.2.2.2.1 of this Supplement). This would result in increased revenue to the federal government. A competitive process, however, could increase costs for developers of solar facilities.

2.3.2.4 Provide Flexibility to Solar Industry

By making fewer BLM-administered lands available for utility-scale solar energy development as compared to the modified program alternative, the modified SEZ alternative could reduce the flexibility of both the agency and developers in terms of identifying appropriate locations for utility-scale development. There are likely to be economically attractive sites for solar energy development outside of the SEZs that can meet the environmental protection measures outlined in the Solar PEIS. It is important to note, however, that the BLM is committed to evaluating the need for new or expanded zones in each of the six states at least every 5 years as described in the proposed SEZ identification protocol (see Appendix D of this Supplement). The BLM will also allow petitions for new SEZs to consider solar energy development in specific areas of interest to industry. The BLM could also decide to amend individual land use plans to accommodate individual solar energy development projects if warranted.

2.3.2.5 Optimize Existing Transmission Infrastructure and Corridors

All of the SEZs are located near existing transmission lines and/or corridors, and development in the SEZs would optimize the use of these transmission facilities. In addition, the BLM is proposing to undertake a variety of activities that will help steer future utility-scale solar energy development to the SEZs (see Section 2.2.2.2.3). These include more detailed evaluation of the transmission needs and impacts for anticipated solar development within SEZs and commitments to engage in ongoing and comprehensive transmission planning efforts to ensure the recognition of SEZs as a priority in transmission development. The BLM will also offer incentives to developers willing to build transmission to SEZs.

There may be potentially suitable development areas for utility-scale solar outside the SEZs that are proximate to existing transmission infrastructure, and these lands would not be available for development under this alternative. The BLM's proposed SEZ identification protocol, however, takes into account proximity to existing transmission infrastructure

(see Appendix D, Section D.2.5). Further, the BLM will also allow petitions for new SEZs to consider solar energy development in specific areas of interest to industry such as in proximity to new foundational transmission lines.

2.3.2.6 Standardize and Streamline the Authorization Process

The modified SEZ program alternative would standardize requirements and reduce uncertainty for project applicants. It would streamline project review and approval processes and ensure consistency in the way utility-scale ROW applications are managed. Because the modified SEZ alternative would limit utility-scale development to those areas most intensively studied in the Solar PEIS, it is likely that BLM staff efforts to review and approve ROW applications would be most efficient under this alternative (due to providing the opportunity for extensive tiering to the analyses presented in the Solar PEIS and the decisions implemented in the resultant ROD and land use plan amendments).

2.3.2.7 Meet Projected Demand for Solar Energy Development

Assuming that all the lands identified as developable within the SEZs are eventually developed, the amount of land available for development under the modified SEZ alternative is about 285,000 acres [1,153 km^2]). Across all six states, the lands available within the SEZs would exceed the amount of land required to support the RFDS projected development of 24,000 MW (corresponding to about 214,000 acres [866 km^2]) by about 71,000 acres (287 km^2). However, as shown in Table 2.3-3, in two states (Arizona and Colorado), the amount of land that would be available for ROW application would not be enough to support the total state-specific development projected in the RFDS. Specifically, in Arizona, the RFDS development would require 21,816 acres (88.3 km^2), which exceeds the 6,465 acres (26 km^2) that would be available under the modified SEZ alternative. In Colorado, 19,746 acres (80 km^2) would be developed under the RFDS, which exceeds the 16,308 acres (66 km^2) that would be available under the modified SEZ alternative. In addition, in California, 138,789 acres (562 km^2) would be developed under the RFDS, which constitutes 90% of the 153,627 acres (622 km^2) acres that would be available.

Constraints on development within some SEZ areas are known to exist; these constraints are summarized in Table 6.1-3 in the Draft Solar PEIS and discussed in greater detail in each of the SEZ-specific analyses presented in Chapters 8 through 13 of the Draft Solar PEIS (this information will be updated as necessary in the Final Solar PEIS). The SEZ-specific analyses identified distinct areas within many of the SEZs that either should not be developed or should have development restrictions (e.g., areas with ephemeral stream channels or floodplains, areas with military flight restrictions for facilities with tall structures, areas with potential visual resource conflicts, and areas close to residences for noisy technologies). The modifications to SEZs identified in this Supplement address many of the constraints on development that were identified in the Draft Solar PEIS. However, it is recognized that some SEZ areas will likely require additional exclusions or restrictions, the extent of which may not be known until site- and project-specific environmental analyses can be completed. Given these factors, it is possible that,

even in states other than Arizona and Colorado, the amount of lands that would be available under the modified SEZ alternative might not be enough to support full development.

Because this alternative may not make an adequate amount of lands available to support the RFDS projections, at least in some states, it is possible that the total amount of utility-scale solar energy developed on BLM-administered lands over the 20-year study period could be constrained unless the BLM identified additional SEZs.

2.3.3 Impacts of the No Action Alternative

No change to the no action alternative is being proposed as part of this Supplement. Analysis of the no action alternative can be found in the Draft Solar PEIS Chapter 6, Section 6.3. For comparison, information on the no action alternative is presented in Tables 2.3-1 and 2.3-2 of this Supplement. Although no changes from the Draft Solar PEIS were made to the categories of lands included under the no action alternative, updated GIS data for NLCS lands resulted in a decrease in the estimated acres (see Table 2.3-1).

2.3.4 Comparison of Alternatives and Selection of Preferred Alternative

This section provides a comparison of the modified alternatives evaluated in this Supplement on the basis of the evaluations presented in Sections 2.3.1 through 2.3.3. The comparison is included to support the BLM‘s decision regarding which alternative presents the best management approach to utility-scale solar energy development on BLM-administered lands based on the stated objectives. Table 2.3-4 provides a summary-level comparison of the management alternatives with respect to the objectives established for the action and the extent to which each alternative would assist the BLM in meeting the projected demands for solar energy development as estimated by the RFDS.

The BLM has selected the modified program alternative as the preferred alternative for the purposes of this Supplement. On the basis of the comparisons presented in Table 2.3-4, it appears that the modified program alternative would best meet the BLM‘s objectives for managing utility-scale solar energy development on BLM-administered lands. It would likely result in the highest pace of development at the lowest cost to the government, developers, and stakeholders. Simultaneously, it would provide a comprehensive approach for ensuring that potential adverse impacts would be minimized to the greatest extent possible. The expected increased pace of development would accelerate the rate at which the economic benefits would be realized at the local, state, and regional levels. This alternative would make an adequate amount of suitable lands available to support the level of development projected in the RFDS and would provide a great deal of flexibility in siting both solar energy facilities and associated transmission infrastructure. In addition, the modified program alternative would be very effective at facilitating development on BLM-administered lands in accordance with the mandates of the Energy Policy Act of 2005 and Secretarial Order 3285A1 (Secretary of the Interior 2010).

TABLE 2.3-4 Comparison of the No Action Alternative and the Modified Action Alternatives with Respect to the BLM's Solar Energy Program Objectives

Objective	Modified Program Alternative	Modified SEZ Alternative	No Action Alternative
Facilitate near-term utility-scale development on public land	Increased pace of development Development in the prioritized SEZs likely to occur at an even faster pace Reduced costs to the government, developers, and stakeholders Effective in assisting the BLM in meeting its mandates[a]	Increased pace of development likely due to detailed analyses of SEZs Reduced costs to the government, developers, and stakeholders Effective in assisting the BLM in meeting its mandates[a]	No discernible effect on pace of development Development could shift toward nonfederal lands, making it more difficult for the BLM to achieve its mandates[a]
Minimize potential environmental impacts	Comprehensive program to identify and avoid, mitigate, or minimize potential adverse impacts Protection of resources, resource uses, and special designations through combination of exclusions, variance areas and associated variance process, and mitigation Prioritization of development in SEZs, which were identified as lands well-suited for solar energy development where potential resource conflicts have been identified and appropriate mitigation has been suggested Potentially would allow a greater degree of development on previously disturbed lands	Comprehensive program to identify and avoid, mitigate, or minimize potential adverse impacts Development limited to the SEZs, protecting more resources, resource uses, and special designations Additional mitigation required in SEZs Limits possibilities for focusing development to previously disturbed lands outside SEZs; will be given consideration in the identification of new SEZs, however	Environmental impacts evaluated project-by-project with potential for inconsistencies in the type and degree of required mitigation If development shifts to nonfederal lands, it would be subject to less federal environmental oversight and public involvement Potentially would allow a greater degree of development on previously disturbed lands

TABLE 2.3-4 (Cont.)

Objective	Modified Program Alternative	Modified SEZ Alternative	No Action Alternative
Minimize potential social and economic impacts	Economic benefits in terms of (1) direct and indirect jobs and income created and (2) ROW rental payments to the federal government Prioritization of development in the SEZs, could concentrate benefits in a smaller number of local economies Potential adverse and beneficial social impacts	Economic benefits in terms of (1) direct and indirect jobs and income created and (2) ROW rental payments to the federal government With development limited to the SEZs, benefits would be concentrated in a smaller number of local economies Potential adverse and beneficial social impacts	Potential economic benefits essentially the same as under the action alternatives, although realized at a slower rate if pace of development is slower Less potential for these benefits to be concentrated in specific areas
Provide flexibility to solar industry	A great degree of flexibility in identifying appropriate locations for utility-scale development	Limited flexibility in identifying appropriate locations for utility-scale development	Maximum degree of flexibility in identifying appropriate locations for utility-scale development Limited guidance to developers on which lands and projects would ultimately be approvable
Optimize existing transmission infrastructure and corridors	Greater opportunities for developers to identify and propose projects that utilize existing transmission infrastructure and/or designated corridors	Opportunities for developers to identify and propose projects that utilize existing transmission infrastructure and/or designated corridors limited to SEZs Proximity to existing transmission infrastructure and corridors will be given consideration in the identification of new SEZs Opportunities to consolidate infrastructure required for new solar facilities	Maximum opportunities for developers to identify and propose projects that utilize existing transmission infrastructure and/or designated corridors

TABLE 2.3-4 (Cont.)

Objective	Modified Program Alternative	Modified SEZ Alternative	No Action Alternative
Standardize and streamline authorization process	Streamlining of project review and approval processes; more consistent management of ROW applications With prioritization of development in the SEZs, additional streamlining of opportunities over development on other available lands	Streamlining of project review and approval processes; more consistent management of ROW applications	No discernible effect in terms of standardizing and streamlining the authorization process
Meet projected demand for solar energy development as estimated by the RFDS	About 20 million acres[b] available for ROW application, which is more than adequate to support the RFDS projected level of development	About 285,000 acres available for ROW application, which may not be enough land to support the RFDS projected level of development in some states BLM identification of additional SEZs in the future would make additional land available but would require additional environmental review and land use plan amendments	About 98 million acres available for ROW application, which is more than adequate to support the RFDS projected level of development

[a] These mandates are established by the Energy Policy Act of 2005 (P.L. 109-58) and Secretarial Order 3285A1 (Secretary of the Interior 2010) (see Section 1.1 of Draft Solar PEIS).

[b] To convert acres to km^2, multiply by 0.004047.

2.3.5 Cumulative Impacts

This section incorporates by reference the assessment of cumulative impacts of developing utility-scale solar energy on BLM-administered lands in the six-state study area over the next 20 years from the Draft Solar PEIS (Section 6.5 of the Draft Solar PEIS). The scope of the cumulative impact analysis in the Draft Solar PEIS was based on solar energy development at the level projected in the RFDS. As discussed in Section 1.6 of this Supplement, the RFDS remains a valid estimate of potential solar development over the next 20 years in the six-state study area.

It is assumed that overall solar development in the six-state study area would be approximately 24,000 MW on BLM-administered lands. This level of development would require a corresponding dedicated use of about 214,000 acres (866 km^2) of BLM-administered lands. As discussed in the Draft Solar PEIS (Section 6.5), the RFDS is considered generally applicable to solar development occurring under all of the alternatives evaluated and represents an appropriate upper bound for the cumulative effects analysis.

Because of the uncertain nature of future projects in terms of size, number, location, and the types of technology that would be employed, the cumulative effects are discussed qualitatively or semi-quantitatively, with ranges given as appropriate. Detailed cumulative impact analyses are provided for individual SEZs in Chapters 8 through 13 of the Draft Solar PEIS and will be updated for the Final Solar PEIS. More detailed analyses of cumulative impacts would be performed in the environmental reviews for specific projects in relation to all other existing and proposed projects in the relevant geographic area.

Modifications to the BLM's action alternatives as presented in this Supplement are expected to result in fewer direct and indirect impacts as compared to the action alternatives analyzed in the Draft Solar PEIS. The BLM has removed from further consideration SEZs that had substantive resource conflicts. The BLM has also established more robust exclusion areas for utility-scale solar energy development and is proposing to identify all remaining lands as variance areas where only the most appropriate development will be allowed to proceed. While the qualitative discussion of cumulative effects in the Draft Solar PEIS remains applicable, readers should note that overall, the BLM expects direct and indirect impacts, and therefore cumulative impacts, to be less in magnitude than contemplated in the Draft Solar PEIS.

By restricting and/or prioritizing development in the SEZs under the two modified action alternatives, cumulative impacts may be more concentrated and/or severe within individual SEZs than described in the Draft Solar PEIS. On the other hand, the concentration of development in the SEZs may also allow for the consolidation of related infrastructure (e.g., roads, transmission lines) and less total land disturbance.

An overview of ongoing and reasonably foreseeable future activities in the six-state study area is presented in Section 6.5.1 of the Draft Solar PEIS, including energy production and distribution, and other activities such as recreation, mineral production, military operations, grazing and rangeland management, fire management, forestry, transportation, and industrial development. General trends in population growth, energy demand, water availability, and

climate change are discussed in Section 6.5.1.2.2 of the Draft Solar PEIS. The BLM will revisit and update information on ongoing and reasonably foreseeable activities and general trends in resources as appropriate in the Final Solar PEIS.

2.3.6 Other NEPA Considerations

The discussion of other NEPA considerations, including unavoidable adverse impacts, short-term uses of the environment and long-term productivity, irreversible and irretrievable commitment of resources, and mitigation of adverse effects are incorporated by reference from the Draft Solar PEIS (Section 6.6). The analysis in these sections remains applicable to the modified action alternatives as presented in this Supplement.

2.4 STATUS OF CONSULTATION UNDER OTHER LAWS AND REGULATIONS

2.4.1 Endangered Species Consultation

As stated in Section 2.2.2.2.2, the BLM will complete ESA consultation on the Solar PEIS with the USFWS under Sections 7(a)(1) and 7(a)(2) of the ESA. The BLM, in consultation with the USFWS, will complete a conservation review under Section 7(a)(1) of the ESA of the overall solar program, including the amendment of 89 land use plans and associated conservation measures. This consultation on the overarching program will provide guidance for subsequent solar projects by ensuring that the appropriate conservation measures for listed species are incorporated into project-level actions. The BLM will also consult with the USFWS on the identification of specific SEZs under Section 7(a)(2) of the ESA; a Biological Assessment will include appropriate mitigation, minimization, and avoidance measures intended to address any effects on listed (endangered and/or threatened) species and designated critical habitat. Further Section 7(a)(2) consultation will occur as necessary at the level of individual projects and will benefit from preceding program- and SEZ-level consultation.

2.4.2 National Historic Preservation Act

As discussed in Section 2.2.2.2.2, the BLM‘s proposed Solar Energy Program represents an interstate undertaking that could have direct and adverse effects upon National Historic landmarks or National Register-eligible properties of national significance. For these reasons and because development of the program is controversial, the BLM requested review and involvement of the ACHP to resolve potential adverse effects of solar energy development under terms of the BLM‘s national PA. The BLM prepared a draft Solar PA describing actions it will follow to take into account the effects of solar energy development on historic properties under Section 106 of the NHPA.

The agency sent this draft Solar PA to the SHPOs in the six states affected, the ACHP, interested parties such as the National Trust for Historic Preservation, and to Indian Tribes in all

six states in early 2011. The draft Solar PA has been revised based on feedback given to the BLM and will be sent to all parties again for comment in the fall of 2011. Negotiations will continue, and the BLM expects to have an executed Solar PA prior to release of the Final Solar PEIS.

The agreement will specify procedures the BLM will take to continue consultation with Tribes regarding historic preservation issues. Steps for the identification of historic properties, evaluations of significance, determinations of effect, and treatment will be articulated. Other actions the agency will follow to achieve transparency and accounting, including training and reporting, are included.

2.4.3 Tribal Consultation

Processes under way will build upon government-to-government consultation undertaken between the BLM and Indian Tribes regarding the Draft Solar PEIS. The BLM expects these actions will continue through completion of the Solar PEIS, signing of the ROD, and beyond, as the agency considers project-specific solar applications to be reviewed under the policies established by the national solar program.

First, results from an ethnographic study focused on Nevada and Utah are now available. The study included interviews with Tribal members and provides insight into Indian activities in the landscapes in and around proposed SEZs. Information shared regarding traditional uses of plants and animals, trails, and sacred sites will enable the BLM to minimize impacts on those areas of highest concern from future solar development. The BLM will contact other Tribes not included in the ethnographic study prior to preparation of the Final Solar PEIS so that they may have the opportunity to share similar knowledge or concerns regarding sacred sites, historic properties, or traditional uses in lands to which they have cultural ties.

Second, as part of the process for distributing this Supplement, the BLM will contact all Tribes with historical or cultural ties to areas that could be affected by solar development in the revised set of SEZs or in lands available for a variance. The agency will again ask Tribes for further government-to-government consultation and feedback regarding the revisions proposed in the document. For those Tribes that provided detailed comments on the Draft Solar PEIS, the BLM will offer to meet face-to-face to discuss concerns expressed and agency strategies to address those issues.

Third, based on all Tribal feedback received, the BLM will write to all Tribes to inform them how their input was taken into account in reaching final decisions documented in the Final Solar PEIS. The agency will explain how government-to-government consultation will continue when new solar applications are received.

3 DOE ALTERNATIVES

The DOE alternatives being analyzed through this Supplement include the no action alternative and an action alternative (DOE's proposed action) under which DOE would develop and adopt programmatic environmental guidance for use in solar projects. In the Draft Solar PEIS, DOE presented its plans to develop such guidance; this Supplement presents the proposed guidance (described and analyzed in Sections 3.2 and 3.3). Examples of DOE-supported solar projects are briefly described in Section 1.4 of the Draft Solar PEIS.

3.1 NO ACTION ALTERNATIVE

Under the no action alternative, DOE would continue its existing case-by-case process for addressing environmental concerns for solar projects supported by DOE in any location (i.e., not restricted to BLM-administered lands). It would not develop programmatic environmental guidance with recommended environmental best management practices and mitigation measures that could be applied to all DOE-supported solar projects. The no action alternative remains unchanged from the Draft Solar PEIS (as described in Section 2.3.1 of the Draft).

3.2 ACTION ALTERNATIVE—DOE'S PROPOSED PROGRAMMATIC ENVIRONMENTAL GUIDANCE

As described in the Draft Solar PEIS, under the proposed action (action alternative), DOE would develop and adopt programmatic environmental guidance, which would be used by DOE to further integrate environmental considerations into its analysis and selection of proposed solar projects. DOE has used the information about environmental impacts provided in the Draft Solar PEIS and other information to develop the proposed programmatic guidance below.

3.2.1 General Mitigation Measures

- Consider siting facilities in pre-determined solar development zones (e.g., an SEZ designated by the BLM) in order to assist in the sharing of technologies, resources, and data to ensure a more detailed understanding of environmental resources, to facilitate consistency with land use planning and zoning designations, and to make use of existing infrastructure (e.g., access to transmission equipment and lines).

- Include, in early correspondence between the applicant and appropriate permitting or interested government agencies, preliminary project designs, planned use of new technologies, plans of development, and related information in sufficient detail to allow adequate evaluation of potential impacts.

- Develop a thorough understanding of all applicable federal, state, and local environmental regulatory requirements, processes, consultations, and interactions.

- Make early contact with local officials, regulators, and inspectors to explore all applicable regulations and address concerns unique to solar power generation projects.

- Conduct early project development discussions with potential energy users to identify how energy production can be transmitted to load centers and increase the ability to finance projects.

- Be aware of possible pre- and post-construction environmental monitoring through agency and public interactions.

3.2.2 Institutional and Public Outreach

- Emphasize early identification of, and communication and coordination with, stakeholders including, but not limited to, federal, state, and local agencies; special interest groups; Native American Tribes and organizations; elected officials; and concerned citizens.

- Consider holding periodic public update meetings and/or hosting a Web site with project and contact information.

- Consider providing renewable energy public relations and scientific program speaker support and input to community educational programs, other interest groups, and the media.

3.2.3 Land Use

- Maximize the use of previously disturbed lands.

- Avoid land requiring deforestation/de-shrubbing and/or significant slope leveling or grading.

- Avoid siting projects on prime or unique farmland.

- Avoid impacts on special use lands such as NPS lands, Wilderness Areas, National Wildlife Refuge System lands, ACECs, Wildlife Management Areas, traditional cultural properties and other culturally sensitive sites, critical habitat for special status species, and military operations areas and other regulated military lands.

- Consult with local agencies regarding potential impacts of developing within, adjacent, or close to state or local special use areas such as parks.

- Use technologies and facility layouts and designs that will minimize land disturbance at a site.

- Avoid or minimize the use of lands that would adversely affect high-use recreational areas such as hiking, camping, and off-road vehicle use locales.

- Consider potential direct and indirect impacts on private lands from project siting.

- Ensure lands considered are appropriately zoned for project development (e.g., industrial or energy development uses).

- Solar development in close proximity to airports will likely trigger the need for consultation with the Federal Aviation Administration (FAA).

3.2.4 Water Resources and Erosion Control

- Consider technologies that minimize water use.

- Consider the sustainable use of water resources through appropriate technology selection, conservation practices, and the protection of the quality of the existing natural water bodies (including streams, wetlands, ephemeral washes, and floodplains, as well as groundwater aquifers).

- Consider the use of rain, gray, and/or other recycled water for facility operations, including plant cooling, steam generation, irrigation, maintenance, and dust suppression.

- Avoid locations that would involve impacts on surface water bodies, ephemeral washes, playas, and natural drainage areas (including groundwater recharge areas).

- To the extent practicable, minimize the use of and impacts on surface and groundwater resources (including sole source aquifers) during construction and operations.

- Avoid groundwater resource project requirements that would result in over-appropriation or over-drafting of any groundwater basin.

- Identify source capacity, prior water rights, and adequacy of capacity to serve project requirements and dependent biological resources in the area.

- Avoid or minimize the use of land within an identified 100-year floodplain or identify engineering controls to mitigate potential impacts.

- Avoid locating facilities on steep slopes, in alluvial fans, and in other areas prone to landslides or flash floods, or within gullies or washes.

- Compare preliminary site grading, drainage, erosion, and sediment control plans with applicable local jurisdiction requirements.

- Consult federal, state, and local "water-wise" guidelines, as applicable, for project development in the arid southwest.

3.2.5 Biological Resources

- Review federal and state databases and technical reports for regulatory requirements for protection of special status animal and plant species and habitats.

- Begin early consultation processes with the USFWS and state environmental agencies for identification of potential issues, and ensure ongoing communication in the course of project development.

- Locate project facilities and ancillary components so that environmentally sensitive areas (e.g., riparian habitats, streams, wetlands, critical wildlife habitats, and other protected areas) are avoided.

- Consider glint, glare, reflection, and linear characteristics of project components on bird and terrestrial animal movements in the project area.

- Develop biological survey protocols and plans in consultation with regulatory agencies to ensure that specific regional and other requirements are met.

- Consider potential impacts on indigenous and special status plant species while addressing controls for non-native/invasive species and noxious weeds.

- Consider reclamation and conservation initiatives for disturbed lands after construction.

- Consider developing habitat restoration and management plans and compensatory mitigation and monitoring plans.

3.2.6 Air Quality

- Identify applicable federal, state, and local air quality management agencies and follow requirements and application procedures.

- Identify all emission sources associated with the proposed technology and/or use information from existing facilities with similar characteristics.

- Consider dust abatement procedures that will minimize particulate matter emissions while reducing the use of extensive amounts of water.

3.2.7 Cultural Resources and Native American Interactions

- Consult cultural resource experts who meet the Secretary of the Interior's Professional Qualification Standards (as defined in 36 CFR Part 61).

- Identify all Tribes and Tribal organizations with cultural and religious ties to the land and resources in the proposed project vicinity and begin a dialogue of information sharing (formal government-to-government consultations may be requested between federal agencies and federally recognized Tribal governments if the federal government or federal funds are involved in a project that affects a Tribe).

- Avoid locations that are in close proximity to sensitive cultural and historic resources.

- Begin early interactions with the SHPO and/or Tribal Historic Preservation Officer to identify cultural resources and potential issues associated with a proposed site.

- In addition to qualified cultural resource experts, consider employment of a qualified Native American monitor to help identify issues and to work in the field during construction activities should unanticipated cultural resources be encountered.

3.2.8 Visual Resources and Aesthetics

- Consider potential impacts on visual resources in the project planning and siting phase, for example, when siting structures, consider landscape characteristics, lighting and glare from facility components, minimizing structure profiles, views from key observation points and nearby recreation lands, and integration of project components with natural land contours and colors.

- Consider potential visual impacts on the nature and character of nearby culturally sensitive and historic structures.

- Consider visual effects of project components on local infrastructure facilities such as schools, hospitals, and housing developments in urban and rural communities.

3.2.9 Socioeconomics

- Site facilities to maximize local, regional, and state-wide economic benefits.

- Site projects to minimize adverse effects on area housing markets and local infrastructure (e.g., schools and other public services) and to ensure adequate housing vacancy rates and local infrastructure support for workers and their families.

- Site facilities to maximize effective integration with existing electrical transmission corridors, including Western Area Power Administration and other power marketing organization transmission resources and population centers that will use the power.

- Give maximum priority to buying American-made solar technologies and components to the extent practicable.

- Employ "local to global" practices in hiring and procurement of goods and services, giving priority to using local labor forces and businesses during construction and operation prior to considering regional, national, and international resources.

3.2.10 Environmental Justice

- Avoid locating facilities where disproportionately high and adverse impacts would be incurred by a minority population or a population whose income is below the poverty level, unless requested by the minority or low-income population.

- Where applicable, work with potentially affected low-income and minority communities to develop appropriate mitigation measures to reduce environmental, human health, social, and economic impacts from the project on identified populations.

3.2.11 Safety and Health

- Consider state and local fire protection ordinances and fire hazard severity zones when siting a project.

- Where appropriate, consider facility setback distances and buffers to separate nearby populations and structures from a proposed facility to minimize impacts from sun reflection (glare), low-frequency sound, electromagnetic fields, noise, air pollution, and other facility-related hazards, wastes, emissions, and discharges.

- Coordinate with the FAA and local aviation or military facility managers to address safety concerns and potential impacts on airports or flight paths in close proximity to solar facilities.

- Consider potential impacts from electromagnetic interference (e.g., impacts on radar, microwave, television, and radio transmissions) in facility design and comply with Federal Communications Commission regulations.

3.3 ANALYSIS OF DOE'S ACTION ALTERNATIVE

This section presents an analysis of DOE's action alternative, under which DOE would develop and adopt programmatic environmental guidance for use in the consideration of future solar projects.

DOE developed the proposed guidance presented in Section 3.2 above to facilitate the advancement of solar energy development. DOE will consider this guidance, including recommended environmental practices and mitigation measures, in its investment and deployment strategies and decision-making process. This guidance would provide DOE with a tool for making more informed, environmentally sound decisions on DOE-supported solar projects.

3.3.1 Impacts of DOE's Proposed Action

The proposed guidance presented in Section 3.2 is intended to better enable DOE to comprehensively determine where to make technology and resource investments to minimize the environmental impacts of solar technologies for DOE-supported solar projects.

DOE could also consider the proposed guidance in establishing environmental mitigation recommendations to be considered by project proponents. The recommendations contained in the guidance, which are based upon the analysis of impacts of solar energy development and potentially applicable mitigation measures presented in Chapter 5 of the Draft Solar PEIS, would help DOE ensure that adverse environmental impacts of DOE-supported solar projects would be avoided, minimized, or mitigated.

Collectively, streamlined environmental reviews, quicker project approval processes, and reduced opposition to solar energy development would likely increase the pace of DOE-sponsored development and reduce the costs to industry, regulatory agencies, and stakeholders. These outcomes would support the mandates of Executive Orders 13212 and 13514 ("Federal

Leadership in Environmental, Energy, and Academic Performance," *Federal Register,* Volume 74, page 52117, Oct. 5, 2009) and Section 603 of the Energy Independence and Security Act of 2007.

Increasing the pace of solar energy development would, in turn, translate into other benefits. Utility-scale solar energy development would result in reduced emissions of GHGs and combustion-related pollutants, if the development offsets electricity generation by fossil fuel power plants (see Section 5.11.4 of the Draft Solar PEIS). If the pace of solar energy development is faster as a result of DOE's proposed action, the potential beneficial impacts of reduced GHG emissions would be realized at a faster rate.

Utility-scale solar energy development would result in local and regional economic benefits in terms of both jobs and income created (see Section 5.17.2 of the Draft Solar PEIS). The associated transmission system development and related road construction would also produce new jobs and income. These benefits would occur as both direct impacts, resulting from wages and salaries, procurement of goods and services, and collection of state sales and income taxes, and indirect impacts, resulting from new jobs, income, expenditures, and tax revenues subsequently created as the direct impacts circulate through the economy. Increasing the pace of solar energy development would cause these economic benefits to be realized at a faster pace as well.

As discussed in Section 5.17.1.1 of the Draft Solar PEIS, there may be some adverse socioeconomic impacts resulting from changes in recreation, property values, and environmental amenities (e.g., environmental quality, rural community values, or cultural values), and disruption potentially associated with solar development. There could also be beneficial socioeconomic impacts in these areas resulting from economic growth and a positive reception to the presence of a renewable energy industry. Increasing the pace of solar energy development would also speed up the pace of these types of socioeconomic changes. At the programmatic level, it is difficult to quantify these impacts.

In summary, the proposed programmatic guidance that DOE has developed under its proposed action will likely minimize the potential adverse environmental impacts of solar energy development for DOE-supported projects. As a result of adopting this guidance in various DOE solar-related programs, the pace of solar energy development could increase.

3.3.2 Impacts of the No Action Alternative

No change to the no action alternative is being proposed as part of the Supplement. As stated in the Draft Solar PEIS, under the no action alternative DOE would continue its case-by-case process for addressing environmental concerns for DOE-supported solar projects. It would not adopt programmatic environmental guidance to apply to DOE-supported solar projects. As a result, DOE would not undertake any specific efforts to programmatically promote the reduction of environmental impacts of solar energy development or streamline environmental reviews for DOE-supported projects. Such achievements, and the potential benefits in terms of increased pace of solar energy development and decreased associated costs, might occur under

the no action alternative, but they would not be explicitly promoted by DOE (by adoption of programmatic environmental guidance with recommended environmental practices and mitigation measures).

3.3.3 Cumulative Impacts

This section incorporates by reference the assessment of cumulative impacts of DOE's action alternative (proposed action) from the Draft Solar PEIS (Section 7.3 of the Draft PEIS). The scope of the cumulative impact analysis in the Draft Solar PEIS was based on solar energy development at the level projected in the RFDS (from tens of thousands of acres in some states to potentially hundreds of thousands of acres in other states). As discussed in Section 1.6 of this Supplement, the RFDS remains a valid estimate of potential solar development over the next 20 years in the six-state study area.

As stated in the Draft Solar PEIS, in all likelihood only a small percentage of utility-scale solar energy development projected in the RFDS would be directly attributable to DOE's proposed action, in light of the anticipated limited availability of federal funds to support such projects in the six-state study area. As a result, the BLM cumulative impact analysis is considered to provide the upper bound description of potential cumulative environmental impacts. Therefore, a separate cumulative impacts analysis for the DOE proposed action was not prepared.

3.3.4 Other NEPA Considerations

The discussion of other NEPA considerations, including unavoidable adverse impacts, short-term uses of the environment and long-term productivity, irreversible and irretrievable commitment of resources, and mitigation of adverse effects, are incorporated by reference from the Draft Solar PEIS (Section 7.4). The analysis in these sections remains applicable to the action alternative as presented in this Supplement.

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5 LIST OF PREPARERS

Table 5-1 lists the U.S. Department of the Interior Bureau of Land Management and U.S. Department of Energy management team members for this Supplement to the Draft Solar Programmatic Environmental Impact Statement (Solar PEIS). Table 5-2 lists the names, education, and expertise of the preparers of this Supplement at Argonne National Laboratory.

TABLE 5-1 Agency Management Team

Name	Office/Title
Bureau of Land Management	
Ray Brady	Minerals and Realty Management Directorate; Chief, National Renewable Energy Coordination Office
Stephen Fosberg	National Renewable Energy Coordination Office; Archaeologist
Linda Resseguie	National Renewable Energy Coordination Office; Solar Program Lead
Gregory Russell	Department of the Interior, Office of the Solicitor, Division of Land and Water Resources; Solicitor
Shannon Stewart	Renewable Resources and Planning Directorate; Senior Planning and Environmental Analyst
U.S. Department of Energy	
Jennifer DeCesaro	Office of Energy Efficiency and Renewable Energy, Solar Energy Technologies Program, Market Transformation; Team Lead
Dr. Jane Summerson	Office of Energy Efficiency and Renewable Energy; Solar PEIS Document Manager
Mark Wieringa	Western Area Power Administration; Environmental Protection Specialist

TABLE 5-2 Preparers of the Supplement to the Draft Solar PEIS at Argonne National Laboratory

Name	Education/Expertise	Contribution
Timothy Allison	M.S., Mineral and Energy Resource Economics; M.A., Geography; 21 years of experience in regional analysis and economic impact analysis.	Technical lead for socioeconomics and environmental justice
Georgia Anast	B.A., Mathematics/Biology; 17 years of experience in environmental assessment.	Comment/response manager
Kevin J. Beckman	B.S., Mathematics and Computer Science; 2 years of experience in Web programming	Public Web site development and maintenance
Bruce Biwer	Ph.D., Chemistry; 21 years of experience in environmental assessment and transportation risk analysis.	Transportation impacts
Matthew Braun	B.S., Anthropology and Psychology, 4 years of archaeological field experience.	Cultural resources analysis
Brian L. Cantwell	B.S., Forestry; 26 years of experience in cartography and GIS mapping.	Technical lead for GIS mapping
Adrianne Carr	Ph.D., Geological and Environmental Sciences; 5 years of experience in hydrological studies and impact analysis.	Water resources analysis
Youngsoo Chang	Ph.D., Chemical Engineering; 21 years of experience in air quality and noise impact analysis.	Technical lead for air quality and climate; acoustic environment
Roberta S. Davidson	M.S., Forest Biometrics; 17 years of experience in environmental assessment, environmental and logistics modeling	Socioeconomics and cumulative impacts analysis support
John Gasper	M.S., M.P.H., Environmental Health Science; 32 years of experience in environmental and energy assessment and program management.	Program Manager
Linda Graf	Desktop publishing specialist; 40 years of experience in creating, revising, formatting, and printing documents.	Document assembly and production
Mark A. Grippo	Ph.D., Biology; 5 years of experience in aquatic resource studies and impact analysis.	Ecological resources analysis; aquatic biota
Antonio C. Guerrero	Certificate in Geographic Information Analysis; 2 years experience in GIS analysis.	Technical support for GIS analysis

TABLE 5-2 (Cont.)

Name	Education/Expertise	Contribution
Heidi M. Hartmann	M.S., Environmental Toxicology and Epidemiology; 24 years of experience in environmental assessment, exposure and risk analysis, and environmental impact assessment.	Project Manager, programmatic analyses
Elizabeth Hocking	J.D.; 18 years of experience in regulatory and policy analysis.	Technical lead for regulatory requirement analysis
Irene Hogstrom	M.A., Geography and Environmental Studies; B.L.A., Landscape Architecture; 22 years of experience in landscape architecture	Visual resources research support
Patricia Hollopeter	B.A., Religion; M.A., Philosophy; 26 years of experience in technical editing and environmental assessment document production.	Lead editor
Ronald Kolpa	M.S., Inorganic Chemistry; B.S., Chemistry; 37 years of experience in environmental regulation, auditing, and planning.	Technical lead for hazardous materials and waste management
Leslie Kirchler	Ph.D., Urban, Technological, and Environmental Planning, Ph.D., Landscape Architecture; 8 years of experience in visual impact analysis and environmental assessment.	Visual resources impact analysis
Thomas J. Kotek	M.S., Computer Science; 36 years of experience in data management and database-driven Web applications.	Webmaster and data management for Draft Solar PEIS online comment submissions
Kirk E. LaGory	Ph.D., Zoology, M.En., Environmental Science; 34 years of experience in ecological research, 23 years in environmental assessment.	Technical lead for ecological resources analysis; threatened and endangered species
James E. May	M.S., Water Resources Management; B.A., Zoology; 33 years of experience in natural resources management; 4 years of consulting experience in land use planning and NEPA compliance.	Technical lead for lands and realty, specially designated areas and lands with wilderness character, livestock grazing, wildland fire, recreation, military and civilian aviation, and minerals assessments
Ellen Moret	M.P.P., Public Policy; B.A., Environmental Studies; 7 years of experience in environmental assessment.	Document technical content management

TABLE 5-2 (Cont.)

Name	Education/Expertise	Contribution
Michele Nelson	Graphic designer; 33 years of experience in graphical design and technical illustration.	Graphics
Ben L. O'Connor	Ph.D., Civil Engineering; 5 years of experience in hydrological studies and impact analysis.	Technical lead for water resources
Terri Patton	M.S., Geology; 23 years of experience in environmental research and assessment.	Technical lead for geological and soil resources; contributor for minerals assessments
Kurt Picel	Ph.D., Environmental Health Sciences; 32 years of experience in environmental health analysis and 18 years in environmental assessment.	Technical lead for cumulative impact analyses
Edgar Portante	M.S., Electrical and Computer Engineering, Management; 30 years of experience in electrical power systems modeling, optimization, and analysis.	Transmission constraints analysis
Pamela Richmond	M.S., Computer Information Systems; 16 years of experience in Web site development and related technology.	Public Web site development and maintenance
Lorenza Salinas	Desktop publishing specialist; 29 years of experience in creating, revising, formatting, and printing documents.	Document assembly and production
Barbara Simmons	B.A., technical writing; E.L.S. certification by the Board of Editors in the Life Sciences; Fellow of the Society for Technical Communication; 46 years of experience in technical editing and publications management.	Editor
Albert E. Smith	Ph.D., Physics; 37 years of experience in policy analysis, air and noise impact assessment, and regulatory analysis.	Air quality analysis support
Karen P. Smith	M.S., B.A., Geology; B.S., Anthropology; more than 22 years of experience in energy and environmental regulatory and policy analysis.	Program Manager, programmatic analyses
Robert Sullivan	M.L.A., Landscape Architecture; 22 years of experience in visual impact analysis and simulation; 13 years in Web site development.	Technical lead for visual resources; public Web site development

TABLE 5-2 (Cont.)

Name	Education/Expertise	Contribution
Jack C. VanKuiken	M.S., Systems Science; 36 years of experience in electrical power systems modeling, optimization, and analysis.	Technical lead for transmission constraints analysis
Robert A. Van Lonkhuyzen	B.A., Biology; 21 years of experience in ecological research and environmental assessment.	Ecological resources analysis; vegetation and plant communities
Bruce Verhaaren	Ph.D., Archaeology; 21 years of experience in archaeological analysis; 17 years in environmental assessment and records management.	Native American concerns analysis; records management
William S. Vinikour	M.S., Biology with environmental emphasis; 35 years of experience in ecological research and environmental assessment.	Ecological resources analysis; wildlife and wild horses and burros
Leroy J. Walston, Jr.	M.S., Biology; 6 years of experience in ecological research and environmental assessment.	Ecological resources analysis; special status species
Konstance L. Wescott	M.A., Anthropology; 24 years of experience in archaeological research and 20 years of experience in environmental assessment.	Technical lead for paleontology, cultural resources, and Native American concerns
Suzanne Williams	B.S., Communication Studies with concentration in English; 27 years of experience in technical communications.	Editor
Emily A. Zvolanek	B.A., Environmental Science; 3 years of experience in GIS mapping.	GIS mapping

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APPENDIX A:

PENDING SOLAR APPLICATIONS AS OF AUGUST 15, 2011

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APPENDIX A:

PENDING SOLAR APPLICATIONS AS OF AUGUST 15, 2011

This appendix presents an update to Appendix B of the Draft Solar PEIS. It presents the current list of pending[1] solar applications, as of August 15, 2011. In total, the U.S. Department of the Interior Bureau of Land Management (BLM) has received more than 300 applications for right-of-way (ROW) authorizations for utility-scale solar facilities to be located on BLM-administered lands. Some of these applications are being processed in accordance with BLM's existing policies, while other applications have been terminated. As of August 15, 2011, the BLM had 79 pending applications for ROW authorizations for solar facilities. These pending applications are shown in Table A-1. The applications are for parabolic trough, power tower, or photovoltaic (PV) facilities. (Note that there are no longer any pending applications for dish engine facilities.)

Table A-2 summarizes the locations, acreage, and estimated electric generation capacities of the pending applications by state. The vast majority of the applications are located in Arizona, California, and Nevada; Colorado and Utah currently have no pending applications.

The total acreage of BLM-administered lands under pending applications is approximately 685,037 acres (2,772 km^2), while the estimated total capacity of the facilities is approximately 33,313 MW. This equates to an average land use of 20.6 acres/MW for all of the pending applications combined. This land use is greater than the land use requirements assumed in the Solar PEIS (i.e., 5 acres/MW for parabolic trough facilities; 9 acres/MW for all other facilities), reflecting the fact that applicants often request more acreage to allow flexibility in project design or to avoid lands where resource conflicts might exist within the ROW application area.

[1] The term "pending" is defined in Section 1.7.2 of this Supplement.

TABLE A-1 Pending Solar Applications on BLM-Administered Lands as of August 15, 2011

Serial Number	Customer Name (Project Name and/or Geographic Area)	Application Received	MW	Total Case Acres	Planned Technology[a]	Field Offices
AZA 034184	BOULEVARD ASSOC LLC (Aguila)	June 26, 2007	500	7,335	CSP/Trough	Hassayampa
AZA 034186	BOULEVARD ASSOC LLC (Burnt Mountain/ Big Horn)	June 26, 2007	500	5,912	CSP/Trough	Hassayampa
AZA 034187	NextEra/BOULEVARD ASSOC LLC (Sonoran Solar)	June 28, 2007	500	4,000	PV	Lower Sonoran
AZA 034200	NextEra/BOULEVARD ASSOC LLC (Mountain Spring)	June 22, 2007	250	6,705	CSP/Trough	Kingman
AZA 034321	AREVA SOLAR AZ II LLC (AUSRA Palo Verde)	October 1, 2007	400	1,867	CSP/CLFR	Hassayampa
AZA 034335	BOULEVARD ASSOC LLC (Bouse)	June 8, 2007	500	24,221	CSP/Trough	Lake Havasu: Yuma
AZA 034357	FIRST SOLAR (Gila Bend)	November 6, 2007	500	6,003	PV	Lower Sonoran
AZA 034358	FIRST SOLAR (Saddle Mtn)	November 6, 2007	300	5,997	PV	Lower Sonoran
AZA 034416	PACIFIC SOLAR INVST INC (Iberdrola) (Eagletail)	December 2, 2007	1,500	26,082	CSP/Trough	Yuma
AZA 034424	PACIFIC SOLAR INVST INC (Iberdrola) (Big Horn)	December 4, 2007	300	7,240	CSP	Hassayampa
AZA 034425	PACIFIC SOLAR INVST INC (Iberdrola) (Hyder)	December 7, 2007	350	4,500	CSP/Trough	Lower Sonoran; Yuma
AZA 034426	PACIFIC SOLAR INVST INC (Iberdrola) (Ranegras)	December 2, 2007	2,000	25,860	CSP/Trough	Yuma
AZA 034427	PACIFIC SOLAR INVST INC (Iberdrola) (La Posa Solar Thermal)	September 6, 2007	2,000	38,212	CSP/Trough	Yuma
AZA 034540	HORIZON WIND ENERGY LLC (Horizon Aguila)	March 4, 2008	250	11,535	CSP/Trough	Hassayampa
AZA 034554	NEXTLIGHT RENEWABLE POWER LLC (Quartzite)	March 26, 2008	500	20,699	CSP/Trough	Yuma

TABLE A-1 (Cont.)

Serial Number	Customer Name (Project Name and/or Geographic Area)	Application Received	MW	Total Case Acres	Planned Technology[a]	Field Offices
AZA 034560	NEXTLIGHT RENEWABLE POWER LLC (Vicksburg)	March 26, 2008	500	15,040	CSP/Trough	Yuma
AZA 034566	NEXTLIGHT RENEWABLE POWER LLC (Centennial)	March 26, 2008	500	13,428	CSP/Trough	Yuma
AZA 034568	NEXTLIGHT RENEWABLE POWER LLC (Palomas)	March 26, 2008	500	20,165	CSP/Trough	Yuma
AZA 034665	SOLAR RESERVE LLC (Black Rock Hill)	May 27, 2008	600	5,600	CSP/Tower	Yuma
AZA 034666	SOLAR RESERVE LLC (Quartzsite)	May 27, 2008	100	1,500	CSP/Tower	Yuma
AZA 034668	SOLAR RESERVE LLC (Agua Caliente)	May 27, 2008	600	5,678	CSP/Tower	Yuma
AZA 034737	ARIZONA SOLAR INVST INC (Haraquahala)	July 10, 2008	250	14,047	PV	Hassayampa
AZA 034739	IDIT INC(Little Horn)	July 9, 2008	1,000	12,291	CSP/Trough	Yuma
AZA 034754	HORIZON WIND ENERGY LLC (Wenden)	March 4, 2008	250	28,760	CSP/Trough	Lake Havasu
AZA 034774	IDIT INC (Dendora Valley)	August 12, 2008	250	14,765	PV	Lower Sonoran
AZA 034797	LSR JACKRABBIT LLC (LSR Jackrabbit)	August 27, 2008	500	27,036	CSP/Tower	Hassayampa
AZA 034799	LSR PALO VERDE LLC (LSR Palo Verde)	August 27, 2008	600	5,855	CSP/Trough	Lower Sonoran
AZA 034936	WILDCAT QUARTZSITE LLC (Quartzite)	January 29, 2009	800	11,960	CSP/Tower	Yuma
AZA 034946	WILDCAT HARCUVAR SOUTH LLC (Bright Source Energy) (Wildcat Harcuvar SO)	January 28, 2009	800	10,947	CSP/Tower	Lake Havasu
AZA 035166	IDIT INC (Arlington West)	July 27, 2009	Unknown	5,800	PV	Lower Sonoran

TABLE A-1 (Cont.)

Serial Number	Customer Name (Project Name and/or Geographic Area)	Application Received	MW	Total Case Acres	Planned Technology[a]	Field Offices
AZA 035236	SOLAR RESERVE (Safford Solar Energy Center/ San Simon)	January 4, 2010	250	22,892	PV	Safford
CACA 048669	FIRST SOLAR (Stateline/Ivanpah)	December 14, 2006	380	5,454	PV	Needles
CACA 048728	NextEra ENERGY (McCoy)	January 31, 2007	250	7,754	PV	Palm Springs-South Coast
CACA 048808	CHUCKWALLA SOLAR 1 LLC (Chuckwalla)	September 15, 2006	200	4,082	PV	Palm Springs-South Coast
CACA 048810	SOLAR MILLENNIUM/ CHEVRON (Palen)	March 14, 2007	500	5,160	CSP/Trough	Palm Springs-South Coast
CACA 048875	DPT BROADWELL LAKE LLC (Broadwell SEGS)	January 24, 2007	1,000	8,625	CSP/Tower	Barstow
CACA 049002	LEOPOLD COMPANY LLC (Ward Valley)	April 2, 2007	250	35,200	CSP/Tower	Needles
CACA 049150	SUNPEAK SOLAR LLC (Superstition Solar I)	July 17, 2007	500	5,464	PV	El Centro
CACA 049397	FIRST SOLAR (Desert Quartzite)	September 28, 2007	700	7,236	PV	Palm Springs-South Coast
CACA 049488	ENXCO INC (Mule Mountain)	November 13, 2007	200	2,049	PV	Palm Springs-South Coast
CACA 049490	ENXCO INC (McCoy)	November 13, 2007	300	20,480	CSP	Palm Springs-South Coast
CACA 049491	ENXCO INC (Desert Harvest)	November 13, 2007	100	930	CSP	Palm Springs-South Coast
CACA 049584	CAITHNESS SODA MTN, LLC (Caithness Soda Mt)	December 14, 2007	350	7,995	CPV	Barstow
CACA 049585	POWER PARTNERS SOUTHWEST (ENXCO) (Troy Lake Soleil)	December 12, 2007	200	3,834	PV	Barstow
CACA 49615	PACIFIC SOLAR INVESTMENTS INC (Iberdrola) (Ogilby Solar)	September 4, 2007	450	7,405	CSP	El Centro
CACA 049884	SOLAR RESERVE LLC (Solar Reserve/Imperial County)	April 24, 2008	250	4,000	CSP/Tower	El Centro

TABLE A-1 (Cont.)

Serial Number	Customer Name (Project Name and/or Geographic Area)	Application Received	MW	Total Case Acres	Planned Technology[a]	Field Offices
CACA 051625	SAN DIEGO GAS & ELECTRIC CO (Ocotillo Sol)	December 17, 2009	14	115	PV	El Centro
CACA 051812	ELEMENT POWER (GrEXt Valley - Atwell)	April 9, 2010	150	1,509	PV	Bakersfield
CACA 052471	RIDGELINE ENERGY (South Kern Solar)	December 23, 2010	20	160	PV	Bakersfield
CACA 052473	RIDGELINE ENERGY (Twisselman Solar)	December 23, 2010	10	80	PV	Bakersfield
CACA 052796	BRIGHTSOURCE ENERGY (Johnson Valley SEGS)	May 23, 2011	800	1,560	CSP/Tower	Barstow
NMNM 119969	ENXCO DEVELOPMENT CORP (Afton)	February 6, 2008	600	3,000	CSP/Trough	Las Cruces
NMNM 120310	IBERDROLA RENEWABLES (Lordsburg Mesa)	March 25, 2008	1,500	24,320	CSP/Trough	Las Cruces
NMNM 121092	SOLAR RESERVE LLC (Lordsburg)	August 11, 2008	100	5,296	CSP/Tower	Las Cruces
NVN 083129	COGENTRIX SOLAR SERVICES LLC (McCullough Pass)	January 18, 2007	1,000	19,840	CSP	Las Vegas
NVN 083914	BRIGHT SOURCE ENGY SOLAR PTNR (Morman Mesa)	July 25, 2007	500	10,000	CSP/Tower	Las Vegas
NVN 084052	NV POWER CO (Dry Lake Valley)	August 14, 2007	125	919	CSP/Trough	Las Vegas
NVN 084232	FIRST SOLAR (Desert Spring)	October 22, 2007	400	5,500	PV	Las Vegas
NVN 084465	PACIFIC SOLAR INVESTMENTS INC (Iberdrola) (Amargosa North)	December 7, 2007	150	7,500	PV	Las Vegas
NVN 084631	BRIGHT SOURCE ENGY SOLAR PTNR	January 28, 2008	1,200	2,000	CSP/Tower	Las Vegas
NVN 084654	NAVY FACENG CMND SW (Fallon NAS Solar)	January 25, 2008	4	37	PV	Stillwater
NVN 084704	AMARGOSA FLATS ENERGY LLC (Crystal/Johnnie)	March 12, 2008	140	7,040	CSP/CLFR	Pahrump

TABLE A-1 (Cont.)

Serial Number	Customer Name (Project Name and/or Geographic Area)	Application Received	MW	Total Case Acres	Planned Technology[a]	Field Offices
NVN 085201	EWINDFARM INC (Johnnie Pahrump)	May 14, 2008	500	10,880	PV	Pahrump
NVN 085801	FIRST SOLAR (Silver State South)	August 25, 2008	350	1,400	PV	Las Vegas
NVN 086158	POWER PARTNERS SOUTHWEST LLC (ENXCO)	September 18, 2008	250	3,885	CSP	Las Vegas
NVN 086159	POWER PARTNERS SOUTHWEST LLC (ENXCO)	September 19, 2008	250	1,751	CSP	Las Vegas
NVN 086248	AUSRA NV I LLC (Highway 160)	October 6, 2008	420	10,080	CSP/Trough	Pahrump
NVN 086249	AUSRA NV I LLC (Spector Range)	October 9, 2008	Unknown	4,480	CSP/Trough	Pahrump
NVN 086350	SOLAR RESERVE LLC (Pahroc Solar)	October 2, 2008	180	7,680	CSP/Tower	Caliente
NVN 086571	ABENGOA SOLAR INC (Lathrop Wells Solar)	December 12, 2008	500	5,336	CSP/Trough	Pahrump
NVN 088552	GA-SNC SOLAR LLC	May 13, 2010	150	825	PV	Las Vegas
NVN 089530	SILVER STATE SOLAR LLC	February 24, 2011	Unknown	5,651	PV	Las Vegas
NVN 089560	GASNA 39 LLC	December 17, 2010	50	600	PV	Las Vegas
NVN 089566	LONE VALLEY LLC	February 11, 2011	20	233	PV	Las Vegas
NVN 089655	ELEMENT POWER	September 9, 2010	100	2,560	PV	Las Vegas
NVN 089656	ELEMENT POWER	September 9, 2010	50	640	PV	Las Vegas
NVN 089657	ELEMENT POWER	September 9, 2010	100	640	PV	Las Vegas
NVN 089658	ELEMENT POWER	September 9, 2010	100	640	PV	Las Vegas
NVN 089659	ELEMENT POWER	September 9, 2010	100	1,280	PV	Las Vegas

[a] CLFR = compact linear Fresnel collector; CSP = concentrating solar power; CPV = concentrating photovoltaic; PV = photovoltaic.

TABLE A-2 Summary Table[a]

State	Pending Applications	Approximate Acreage	Estimated MW
Arizona	31	411,932	17,850
California	20	129,092	6,624
Colorado	0	0	0
New Mexico	3	32,616	2,200
Nevada	25	111,397	6,639
Utah	0	0	0
Total	79	685,037	33,313

[a] Data current as of August 15, 2011.

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APPENDIX B:

SOLAR ENERGY ZONES DROPPED FROM FURTHER CONSIDERATION

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CONTENTS

FIGURES

APPENDIX B:

SOLAR ENERGY ZONES DROPPED FROM FURTHER CONSIDERATION[1]

B.1 ARIZONA

B.1.1 Bullard Wash

B.1.1.1 Summary of Potential Impacts Identified in the Draft Solar Programmatic Environmental Impact Statement (PEIS)

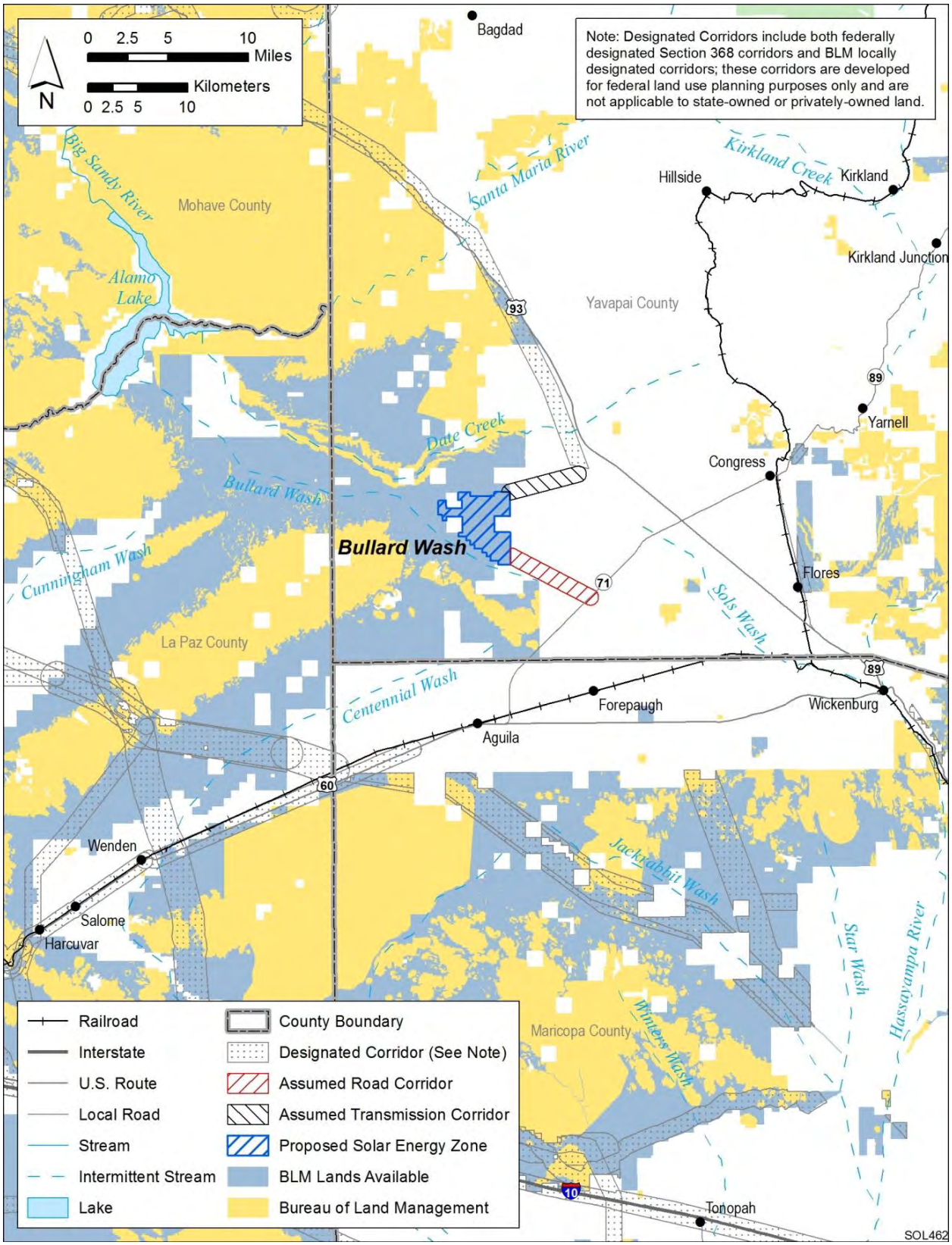
The proposed Bullard Wash solar energy zone (SEZ), as presented in the Draft Solar PEIS, had a total area of 7,239 acres (29.3 km^2). It is located in Maricopa County in west–central Arizona (Figure B.1.1-1). The town of Aguila is located about 12 mi (19 km) south of the SEZ.

The Draft Solar PEIS identified a 500-kV transmission line that passes about 5 mi (8 km) northeast of the SEZ as the nearest point of connection of the SEZ to the grid. The Draft Solar PEIS also identified State Route 71, located about 5 mi (8 km) southeast of the southeastern tip of the SEZ, as the nearest major road, and assumed that a new access road would be constructed from the proposed SEZ to State Route 71 to support development.

Potential environmental and other impacts identified in the Draft Solar PEIS included the following:

- Wilderness characteristics in the Tres Alamos Wilderness Area (WA) between 3.5 and 7 mi (6 and 11 km) of the border of the SEZ and within the viewshed of the SEZ would be adversely affected.
- There would be small adverse impacts on the Pipeline Ranch and Central Arizona Ranch Company grazing allotments.
- Areas developed for solar energy production would be closed to recreational use. Inventoried off-highway vehicle routes would be closed.
- The U.S. Department of Defense expressed concern that any development in the SEZ that exceeds 250 ft (76 m) in height would interfere with military operations in three military training routes.

[1] In this appendix, acronyms are defined in each subsection to facilitate use of the subsections as individual resources.



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2 **FIGURE B.1.1-1 Proposed Bullard Wash SEZ as Presented in the Draft Solar PEIS**

- Impacts on soil resources (e.g., soil compaction, soil horizon mixing, soil erosion by wind and runoff, sedimentation, and soil contamination) could occur.

- Groundwater use would deplete the aquifer to the extent that, at a minimum, wet-cooling options would not be feasible.

- Over much of this SEZ, the dominant species present include Joshua tree and saguaro cactus. Clearing of a large portion of the proposed SEZ could primarily affect wetland, dry wash, dry wash woodland, mesquite bosque, riparian, Joshua tree, and saguaro cactus communities, depending on the amount of habitat disturbed. The establishment of noxious weeds could result in habitat degradation.

- Potentially suitable habitat for 39 special status species occurs in the affected area of the proposed SEZ; less than 1% of the potentially suitable habitat for any of these species and any wildlife species occurs in the region that would be directly affected by development.

- If aquatic biota are present, they could be affected by the direct removal of surface water features within the construction footprint, a decline in habitat quantity and quality due to water withdrawals and changes in drainage patterns, as well as increased sediment and contaminant inputs associated with ground disturbance and construction activities.

- Temporary exceedances of ambient air quality standards for particulate matter at the SEZ boundaries are possible during construction. These high concentrations, however, would be limited to the immediate area surrounding the SEZ boundary.

- Although the SEZ is in an area of low scenic quality, strong visual contrasts could be observed by residents nearest to the SEZ. Strong visual contrasts could also be observed by visitors to the Tres Alamos WA. Weak to moderate visual contrasts could be observed by visitors to the Arrastra Mountain WA, while moderate to strong visual contrasts could be observed by travelers on Joshua Forest Scenic Road.

- The potential for impacts on significant paleontological and cultural resources is unknown. No surveys have been conducted in the proposed SEZ, and no sites have been recorded to date. Development within the SEZ may result in visual or audible disturbance to sacred areas in the nearby mountains. The SEZ itself does contain plant and animal species traditionally important to the Yavapai, and development in the proposed SEZ would eliminate some traditionally important plants and some habitat of traditionally important animals.

B.1.1.2 Summary of Comments Received

Most of the comments received from environmental groups on the proposed Bullard Wash SEZ were in favor of eliminating the area as an SEZ (The Wilderness Society et al.,[2] Western Watersheds Project, and Tonopah Area Coalition) because of concerns about the plant and wildlife community present in the SEZ, potential effects on special status species in the area, and its remote location. The Wilderness Society et al. were also concerned about groundwater availability and the effect of water withdrawals on groundwater-dependent species, and commented that development should be considered only in areas toward the southern end of the SEZ where low-density plant communities exist. The Tonopah Area Coalition expressed concern that the SEZ is located in an important transition zone between the Joshua Tree forest and the Sonoran Desert. The Western Watersheds Project recommended that the PEIS must consider the impact of noise on native and migratory wildlife species and also expressed concern for the Sonoran desert tortoise that may occur in the affected area of the SEZ.

The U.S. Department of the Interior Bureau of Land Management (BLM) staff in Arizona has confirmed that the eastern portion of the proposed SEZ has dense vegetative communities composed of saguaro cactus, Joshua trees, creosote brush, palo verde, and desert grasses. The BLM Arizona staff also noted that the combination of the dense vegetation and active washes in the SEZ contribute to a sustained community of wildlife, and that the southern boundary is relatively close to a major wash that would be cut off to wildlife migrating from the northern mountain range if this area were developed.

B.1.1.3 Rationale for Eliminating the SEZ

On the basis of public comments received on the Draft Solar PEIS, review by the BLM, and continued review of potential impacts identified in the Draft Solar PEIS, the Bullard Wash SEZ will be eliminated from further consideration and will not be identified as an SEZ in applicable land use plans. The potential impacts from solar development in the proposed Bullard Wash SEZ were considered sufficient reason to eliminate the area from further consideration as an SEZ.

Although the area will be dropped from consideration as an SEZ, the lands that composed the proposed Bullard Wash SEZ will be retained as solar right-of-way variance areas, because the BLM expects that individual projects could be sited in this area to avoid and/or minimize impacts. Any solar development within this area in the future would require appropriate environmental analysis.

[2] The Wilderness Society, Sonoran Institute, Sierra Club–Grand Canyon Chapter, Arizona Wilderness Coalition, Tucson Audubon Society, Friends of Ironwood Forest, Defenders of Wildlife, Sky Island Alliance, Grand Canyon Wildlands Council, Natural Resources Defense Council, Soda Mountains Wilderness Council, and Sierra Treks submitted joint comments on the proposed Arizona SEZs. Those comments are attributed to The Wilderness Society et al.

B.2 CALIFORNIA

B.2.1 Iron Mountain

B.2.1.1 Summary of Potential Impacts Identified in the Draft Solar Programmatic Environmental Impact Statement (PEIS)

The proposed Iron Mountain solar energy zone (SEZ), as presented in the Draft Solar PEIS, had a total area of 106,522 acres (431 km^2). It is located in San Bernardino County in southeastern California, about 20 mi (32 km) from the Arizona border (Figure B.2.1-1). The SEZ is in a mostly undeveloped area, with no population centers within a 20-mi (32-km) radius.

Potential environmental and other impacts identified in the Draft Solar PEIS included the following:

- A potential hazard associated with unexploded military ordnance from past military training activities was identified.

- Wilderness characteristics within the Turtle Mountains, Old Woman Mountains, and Palen-McCoy Wilderness Areas (WAs) would be adversely affected by solar development in the SEZ. Scenic resources in the Turtle Mountains Area of Critical Environmental Concern would also be adversely affected. Night-time lighting of solar facility development in the SEZ could adversely affect the quality of the night sky environment as viewed from Joshua Tree National Park (NP).

- Recreational users would lose the use of any portions of the SEZ developed for solar energy production. Wilderness recreational use in the Turtle Mountains, Old Woman Mountains, and Palen-McCoy WAs would likely be adversely affected.

- The development of any solar energy facilities that encroach into the airspace of military training routes would create safety issues and would conflict with military training activities.

- Impacts on soil resources (e.g., soil compaction, soil horizon mixing, soil erosion by wind and runoff, sedimentation, and soil contamination) could occur. Danby Lake may not be a suitable location for construction.

- Designation of the SEZ would affect the Danby Lake known sodium leasing area in the northwest corner of the SEZ. Designation of the SEZ could make sand and gravel resources unavailable.

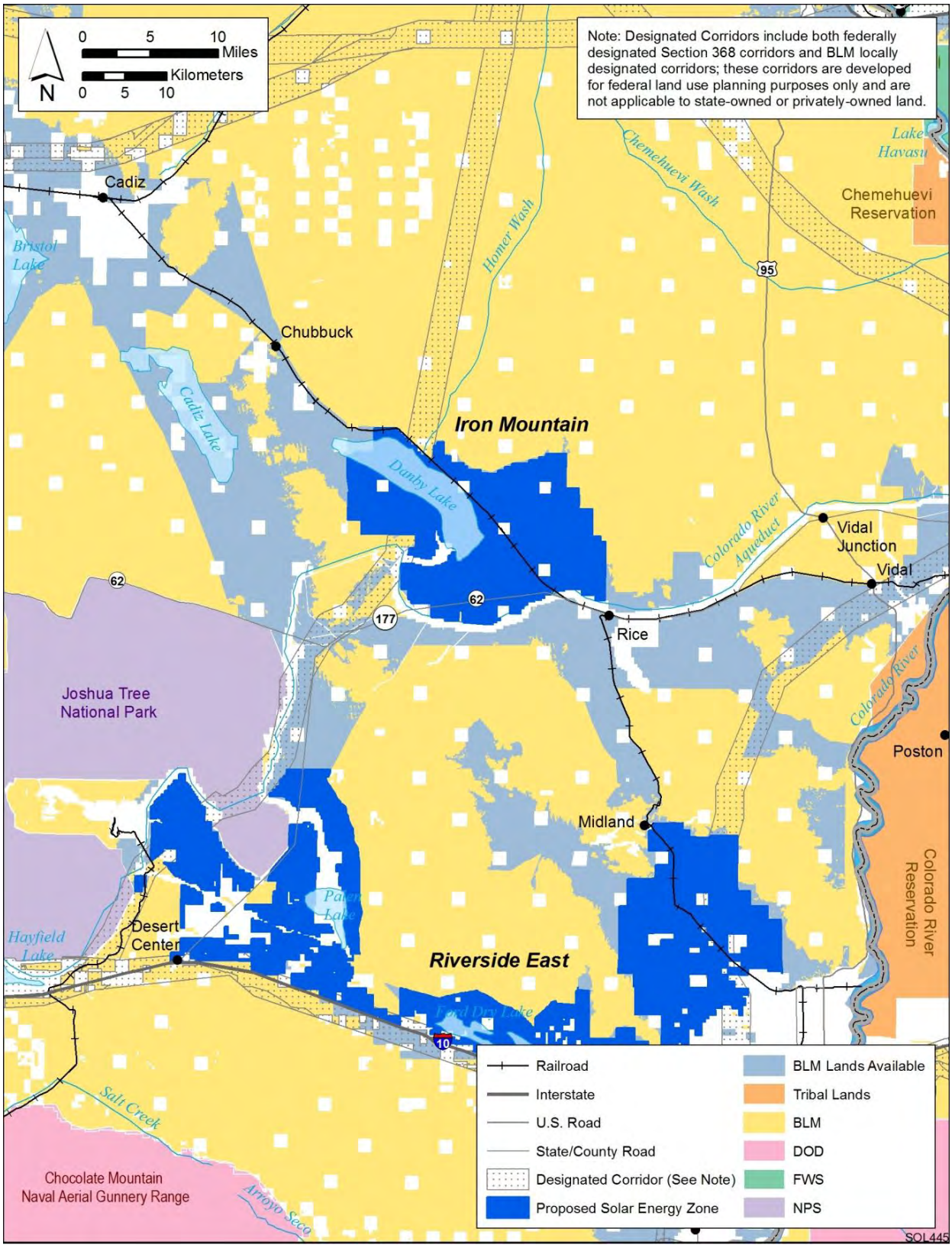


FIGURE B.2.1-1 Proposed Iron Mountain SEZ as Presented in the Draft Solar PEIS

- Groundwater use would deplete the aquifer to the extent that, at a minimum, wet-cooling options would not be feasible. Hydrological disturbances near Danby Lake could cause localized flooding and erosion, affect groundwater recharge and discharge processes, and disrupt salt-mining operations. High total dissolved solids values of groundwater near the Danby Lake region could produce water that is nonpotable and corrosive to infrastructure.

- Clearing of a large portion of the proposed SEZ could primarily affect sand dune, playa, desert chenopod scrub, riparian, and dry wash communities, depending on the amount of habitat disturbed. The establishment of noxious weeds could result in habitat degradation.

- Potentially suitable habitat for 43 special status species occurs in the affected area of the proposed SEZ; between 1.0% and 7.5% of the potentially suitable habitat for any of these species and any wildlife species occurs in the region that would be directly affected by development.

- If aquatic biota are present in ephemeral water features (e.g., Homer Wash), they could be affected by the direct removal of surface water features within the construction footprint, a decline in habitat quantity and quality due to water withdrawals and changes in drainage patterns, as well as increased sediment and contaminant inputs associated with ground disturbance and construction activities.

- Temporary exceedances of ambient air quality standards for particulate matter at the SEZ boundaries are possible during construction. These high concentrations, however, would be limited to the immediate area surrounding the SEZ boundary. Modeling indicates Class I Prevention of Significant Deterioration PM_{10} (particulate matter with an aerodynamic diameter of 10 μm or less) increments at the nearest federal Class I area (Joshua Tree NP) could be exceeded under conservative assumptions.

- Strong visual contrasts could be observed by visitors to the Palen-McCoy WA and travelers on State Road 62 and Cadiz Road. Moderate to strong visual contrasts could be observed by visitors to the Old Woman Mountains and Turtle Mountains WAs. Moderate visual contrasts could also be observed by visitors to the Rice Valley WA, while weak to moderate visual contrasts could be observed by visitors to the Joshua Tree NP and Joshua Tree WA.

- Noise levels at the nearest residences would be higher during operations than the San Bernardino County and U.S. Environmental Protection Agency guidance levels if concentrating solar power facilities with energy storage technologies (which could extend the daily operational time by 6 hours or more) were used at the SEZ.

- The potential for impacts on significant paleontological and cultural resources is largely unknown. The area around Danby Lake within the SEZ has a high potential to contain paleontological deposits and would require a paleontological survey. Numerous prehistoric and Native American sites and trails are potentially located within the SEZ and could be affected by solar energy development. It is possible that there will be Native American concerns about the Salt Song Trail, which passes just west of the proposed SEZ.

B.2.1.2 Summary of Comments Received

Many comments on the proposed Iron Mountain SEZ were received; most were in favor of eliminating the area as an SEZ because it contains environmentally and culturally sensitive areas (California Public Utilities Commission, Center for Biological Diversity, Big Pine Paiute of the Owens Valley, California Desert Coalition, Natural Resources Defense Council [NRDC] et al.,[3] Western Watersheds Project, National Parks Conservation Association, The Nature Conservancy, California Native Plant Society (CNPS), San Manuel Band of Mission Indians, Sierra Club, and Defenders of Wildlife). The Big Pine Paiute of the Owens Valley and the San Manuel Band of Mission Indians were concerned about the direct impacts on significant cultural resources. Many commentors opposed the Iron Mountain SEZ because of its proximity to Joshua Tree NP. The NRDC et al. commented that the SEZ was inconsistent with criteria developed by the conservation community for siting solar facilities in the desert. It was concerned that the SEZ includes 10,007 acres (40 km^2) of Citizen Proposed Wilderness, that development of the SEZ would preclude opportunities to connect Joshua Tree NP with the Mojave Preserve, and that the SEZ is located within a U.S. Department of the Interior Bureau of Land Management (BLM)-designated multi-habitat management area. The NRDC et al. mentioned that the SEZ was located in an essential habitat-connectivity linkage area for desert bighorn sheep populations.

The Metropolitan Water District of Southern California was concerned about the possible impacts on its facilities and recommended that the BLM also consider cumulative effects of solar energy development on the water district's facilities. The Western Watersheds Project cited multiple conflicts with wildlife and habitat resources and argued that the area provides desert tortoise connectivity between the Northern and Eastern Colorado Desert Tortoise Recovery Units and contains habitat for rare plants. The National Parks Conservation Association was opposed to the SEZ because it would require significant infrastructure, would have adverse impacts on night sky resources in Joshua Tree NP, and would inhibit wildlife movements among the Mojave National Preserve, several wilderness areas to the south of the SEZ, and Joshua Tree NP.

[3] The Natural Resources Defense Council, Audubon Society, California Native Plant Society, California Wilderness Coalition, Californians for Western Wilderness, Defenders of Wildlife, the National Parks Conservation Association, Point Reyes Bird Observatory Conservation Science, Sierra Club, The Wilderness Society, and The Wildlands Conservancy submitted joint comments on the proposed California SEZs. Those comments are attributed to NRDC et al.

The California Energy Commission (CEC) commented that the SEZ is not ideal for solar energy development but did not recommend eliminating the SEZ. The CEC recommended that the BLM make development of the Iron Mountain SEZ a low priority because of its remote location and high-value Mojave desert tortoise habitat corridors. The CNPS argued against designation of Iron Mountain as an SEZ because it contains ecologically important vegetation communities and because numerous prehistoric and historic sites have been identified within the SEZs. Like other environmental groups, the Sierra Club commented that the development of the SEZ would have adverse impacts on desert tortoise and sensitive biological, cultural, and visual resources. Last, the Citizens for the Chuckwalla Valley were concerned about possible environmental justice impacts on people in the nearby communities of Rice, Blythe, and Desert Center.

B.2.1.3 Rationale for Eliminating the SEZ

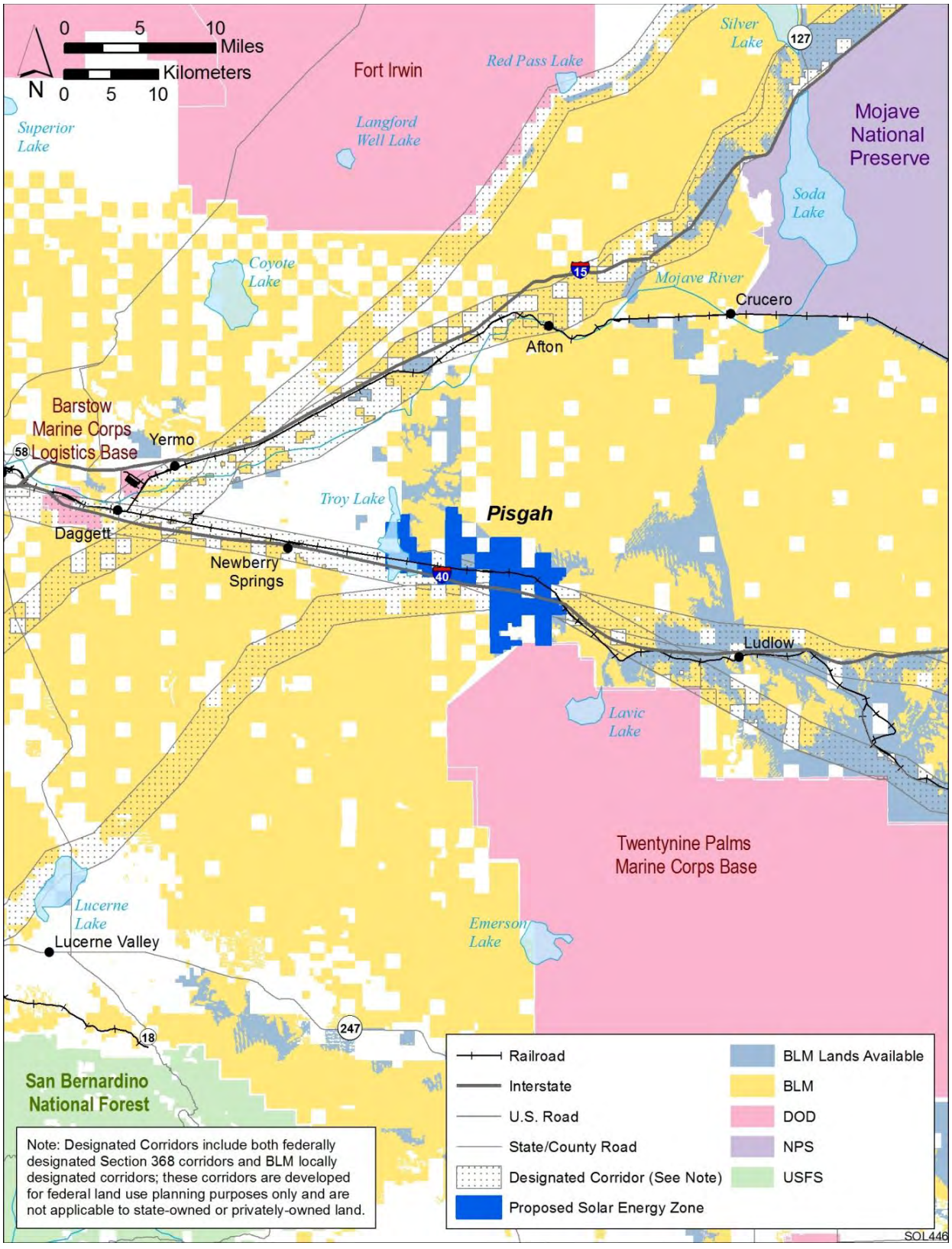
On the basis of public comments received on the Draft Solar PEIS, review by the BLM, and continued review of potential impacts identified in the Draft Solar PEIS, the Iron Mountain SEZ will be eliminated from further consideration and will not be identified as an SEZ in applicable land use plans. The potential impacts from solar development in the proposed Iron Mountain SEZ were considered sufficient reason to eliminate the area from further consideration as an SEZ.

Because of the extensive potential impacts from solar development in the proposed Iron Mountain SEZ, the lands that composed the SEZ as presented in the Draft Solar PEIS will be considered solar right-of-way exclusion areas; that is, applications for solar development on these lands will not be accepted by the BLM.

B.2.2 Pisgah

B.2.2.1 Summary of Potential Impacts Identified in the Draft Solar Programmatic Environmental Impact Statement (PEIS)

The proposed Pisgah solar energy zone (SEZ), as presented in the Draft Solar PEIS, had a total area of 23,950 acres (97 km^2). It is located in San Bernardino County in southeastern California (Figure B.2.2-1). The City of Barstow is located about 25 mi (40 km) to the west of the SEZ. There are a few residences close to the northwestern and southwestern boundaries of the proposed SEZ, but the nearest population center is Newberry Springs, which is located about 6 mi (10 km) to the west.



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2 **FIGURE B.2.2-1 Proposed Pisgah SEZ as Presented in the Draft Solar PEIS**

A designated Section 368 energy corridor[4] occupies a portion of the SEZ and could limit development in the SEZ if the corridor were developed, because solar facilities cannot be constructed under transmission lines or over pipelines. Further, the Draft Solar PEIS discussion of impacts of solar energy development in the SEZ acknowledged that solar facility development on both sides of the corridor would limit the ability to add future corridor capacity.

Potential environmental and other impacts identified in the Draft Solar PEIS included the following:

- Wilderness characteristics in 20% of the Cady Mountain Wilderness Study Area (WSA) and 27% of the Rodman Mountain Wilderness Area (WA) would be adversely affected by solar development in the SEZ. The Ord-Rodman Desert Wildlife Management Area and Pisgah Area of Critical Environmental Concern (ACEC) abut portions of the Pisgah SEZ and would be vulnerable to increased human traffic induced by the presence of the SEZ. The Rodman Mountains Cultural Area would also be vulnerable to increased traffic.

- The presence of solar development in the SEZ likely would adversely affect recreational use of the Cady Mountains WSA and Rodman Mountains WA. Opportunities for primitive recreation surrounding the SEZ would be reduced.

- The development of any solar energy facilities that encroach into the airspace of military training routes could conflict with military training activities and create a safety concern.

- Impacts on soil resources (e.g., soil compaction, soil horizon mixing, soil erosion by wind and runoff, sedimentation, and soil contamination) could occur. The Pisgah lava field may not be a suitable location for construction.

- Currently, 103 mining claims occur within the SEZ; most of these are in the area south of Interstate-40, where there has been a mining operation for many years. These mining claims represent a prior existing right that, if valid, likely would preclude solar energy development as long as they are in place.

- Groundwater use would deplete the aquifer to the extent that, at a minimum, wet-cooling options would not be feasible.

[4] Section 368 of the Energy Policy Act of 2005 (Public Law 109-58) required federal agencies to engage in transmission corridor planning (see Section 1.6.2.1 of the Draft Solar PEIS). As a result of this mandate, the U.S. Department of the Interior Bureau of Land Management (BLM), U.S. Department of Energy (DOE), U.S. Forest Service (USFS), and U.S. Department of Defense prepared a PEIS to evaluate the designation of energy corridors on federal lands in 11 western states, including the 6 states evaluated in this study (DOE and DOI 2008). The BLM and USFS issued Records of Decision to amend their respective land use plans to designate numerous corridors, often referred to as Section 368 corridors.

- Clearing of a large portion of the proposed SEZ could primarily affect sand dune, playa, desert chenopod scrub, and dry wash communities, depending on the amount of habitat disturbed. The establishment of noxious weeds could result in habitat degradation.

- Potentially suitable habitat for 54 special status species occurs in the affected area of the proposed SEZ; less than 3% of the potentially suitable habitat for any of these species and any wildlife species occurs in the region that would be directly affected by development.

- If aquatic biota are present, they could be affected by the direct removal of surface water features within the construction footprint, a decline in habitat quantity and quality due to water withdrawals and changes in drainage patterns, as well as increased sediment and contaminant inputs associated with ground disturbance and construction activities.

- Temporary exceedances of ambient air quality standards for particulate matter at the SEZ boundaries are possible during construction. These high concentrations, however, would be limited to the immediate area surrounding the SEZ boundary.

- The SEZ is located within the California Desert Conservation Area (CDCA), and substantial, non-mitigable visual impacts would occur within the CDCA in the SEZ and surrounding lands. Strong visual contrasts could be observed by travelers on Historic Route 66 and the Burlington Northern Santa Fe Amtrak passenger rail line. Moderate to strong visual contrasts could be observed by visitors to the Rodman Mountains and Cady Mountains WAs. Moderate visual contrasts could also be observed from the community of Newberry Springs, while weak to moderate visual contrasts could be observed by visitors to the Newberry Mountains WA.

- During construction, noise levels at the nearest residences would be higher than the San Bernardino County regulation and the U.S. Environmental Protection Agency (EPA) guidance levels. During operations, noise levels at the nearest residences would be above San Bernardino County and EPA guidance levels if concentrating solar power technologies with energy storage technologies (which could extend the daily operational time by 6 hours or more) were used at the SEZ. Noise levels at the nearest residence would be slightly higher than the San Bernardino County regulation if the SEZ were developed with dish engine facilities.

- The potential for impacts on significant paleontological and cultural resources is relatively unknown, but could be high in some areas. Numerous prehistoric and Native American sites and trails are potentially located within the SEZ and could be affected by solar energy development. The SEZ includes plant species and could contain game species important to Native Americans.

Ground-disturbing activities have the potential for adversely affecting these resources, along with archaeological resources and burials important to Native Americans.

- Both minority and low-income populations occur within a 50-mi (80-km) radius of the proposed SEZ boundary; thus adverse impacts of solar development could disproportionately affect minority and low-income populations.

B.2.2.2 Summary of Comments Received

Many comments were received on the proposed Pisgah SEZ; most were in favor of eliminating the area as an SEZ because it contains environmentally and culturally sensitive areas (Center for Biological Diversity, Big Pine Paiute of the Owens Valley, California Desert Coalition, Natural Resources Defense Council [NRDC] et al.,[5] Western Watersheds Project [WWP], The Nature Conservancy, California Native Plant Society [CNPS], San Manuel Band of Mission Indians, Sierra Club, and Defenders of Wildlife). Pacific Gas and Electric Company recommended changing the SEZ boundaries to eliminate inappropriate areas from consideration. The Big Pine Paiute of the Owens Valley, the San Manuel Band of Mission Indians, and the NRDC et al. were concerned about the direct impacts on significant cultural resources. The NRDC et al. commented that the SEZ is incompatible with the BLM's conservation responsibilities under the Endangered Species Act, Federal Land Policy and Management Act, and its own wildlife resource manuals. The NRDC et al. mentioned that the SEZ is located in an area of essential habitat connectivity and recommended that cumulative impacts on the value of the area as a wildlife corridor be addressed.

The Metropolitan Water District of Southern California was concerned about socioeconomic impacts, including any financial or ratepayer impacts from development of the SEZ, and recommended that the BLM also consider cumulative effects of solar energy development on the water district's facilities. WWP cited multiple conflicts with wildlife and habitat resources and argued that there would be impacts on bighorn sheep movement. WWP was also concerned that the area provides the only connectivity between tortoises in the Southern Mojave and Central Mojave populations, and development of the SEZ would affect connectivity between the West Mojave recovery unit and the eastern desert tortoise recovery units. The area is also adjacent to two ACECs and a WSA. The California Public Utilities Commission and other groups expressed concern for desert tortoise habitat located within and near the SEZ.

[5] The NRDC, Audubon Society, California Native Plant Society, California Wilderness Coalition, Californians for Western Wilderness, Defenders of Wildlife, the National Parks Conservation Association, Point Reyes Bird Observatory Conservation Science, Sierra Club, The Wilderness Society, and The Wildlands Conservancy submitted joint comments on the proposed California SEZs. Those comments are attributed to NRDC et al.

The Wilderness Society et al.[6] expressed concern for the golden eagle population near the SEZ and indicated that development in the proposed Pisgah SEZ would constitute a "take" of golden eagles, because it would disturb and destroy the foraging habitat of nearby golden eagles. The CNPS argued against designation of Iron Mountain as an SEZ because it is regionally significant in sustaining biological diversity and because development in the SEZ could result in loss of habitat and displacement of many species, including sensitive species. Like other environmental groups, the Sierra Club commented that the development of the SEZ would have adverse impacts on desert tortoise and sensitive biological, cultural, and visual resources. San Bernardino County recommended that only dry-cooling technologies be allowed.

B.2.2.3 Rationale for Eliminating the SEZ

On the basis of public comments received on the Draft Solar PEIS, review by the BLM, and continued review of potential impacts identified in the Draft Solar PEIS, the Pisgah SEZ will be eliminated from further consideration and will not be identified as an SEZ in applicable land use plans. The potential impacts from solar development in the proposed Pisgah SEZ were considered sufficient reason to eliminate the area from further consideration as an SEZ.

Although the area will be dropped from consideration as an SEZ, most of the lands that composed the proposed Pisgah SEZ will be retained as solar right-of-way variance areas, because the BLM expects that individual projects could be sited in this area to avoid and/or minimize impacts. Any solar development within this area in the future would require appropriate environmental analysis.

An exception to the above will be made for specific lands identified during the environmental review process for the approved Calico Solar Project (CACA 49537), which comprises more than 4,600 acres (19 km^2) within the SEZ. Through the Calico environmental review process, some parts of the project area were identified as areas where solar development should be avoided; these areas will now be identified as solar right-of-way exclusion areas, that is, areas where applications for solar development will not be accepted by the BLM.

[6] The Wilderness Society, Natural Resources Defense Council, Defenders of Wildlife, Sonoran Institute, Wild Utah Project, New Mexico Wilderness Alliance, Tucson Audubon Society, Audubon Wyoming, Friends of Ironwood Forest, Arizona Wilderness Coalition, Southern Utah Wilderness Alliance, California Wilderness Coalition, Nevada Conservation League & Education Fund, Nevada Wilderness Project, Audubon New Mexico, Soda Mountain Wilderness Council, Center for Native Ecosystems, Western Environmental Law Center, Californians for Western Wilderness, Gila Resources Information Project, Gila Conservation Coalition, National Audubon Society, San Luis Valley Ecosystem Council and the Sierra Club submitted joint comments on the Draft Solar PEIS. Those comments are attributed to The Wilderness Society et al.

B.3 NEVADA

B.3.1 Delamar Valley

B.3.1.1 Summary of Potential Impacts Identified in the Draft Solar Programmatic Environmental Impact Statement (PEIS)

The proposed Delamar Valley solar energy zone (SEZ), as presented in the Draft Solar PEIS, had a total area of 16,552 acres (67 km^2). It is located in Lincoln County in southeastern Nevada (Figure B.3.1-1). The largest nearby town is the city of Alamo, Nevada, about 11 mi (18 km) west of the SEZ.

The Draft Solar PEIS identified U.S. 93, about 9 mi (14.5 km) west of the SEZ, as the nearest major road and assumed that a new access road would be constructed from there to the proposed SEZ to support development (see Figure B.3.1-1). The Draft Solar PEIS identified a locally designated transmission corridor that occupies about 2,919 acres (12 km^2), or 22%, of the eastern portion of the proposed Delamar Valley SEZ, and a right-of-way (ROW) application from the Southern Nevada Water Authority (SNWA) for a pipeline that would pass through the middle of the proposed SEZ. Both of these ROWs could limit development in the SEZ because solar facilities cannot be constructed under transmission lines or over pipelines. Further, the Draft Solar PEIS discussion of impacts of solar energy development in the SEZ acknowledged that solar facility development on both sides of the corridor would limit the ability to add future corridor capacity.

Potential environmental and other impacts identified in the Draft Solar PEIS included the following:

- Because of the 14-mi (23-km) length of the SEZ, east–west travel across the valley could be cut off, requiring extensive detours for public land users.

- Visual impacts of solar energy development would have the potential to affect wilderness characteristics of the Delamar Mountains and South Pahroc Wilderness Areas (WAs). Night-time lighting of solar development could adversely affect the quality of the night sky environment in adjacent specially designated areas.

- If full solar development would occur in the SEZ, the federal grazing permit for the Buckhorn grazing allotment would be reduced in area by about 18% and about 606 animal unit months would be lost.

- Because the SEZ includes numerous roads and trails, construction of solar energy facilities could cause a major impact on existing recreation travel.

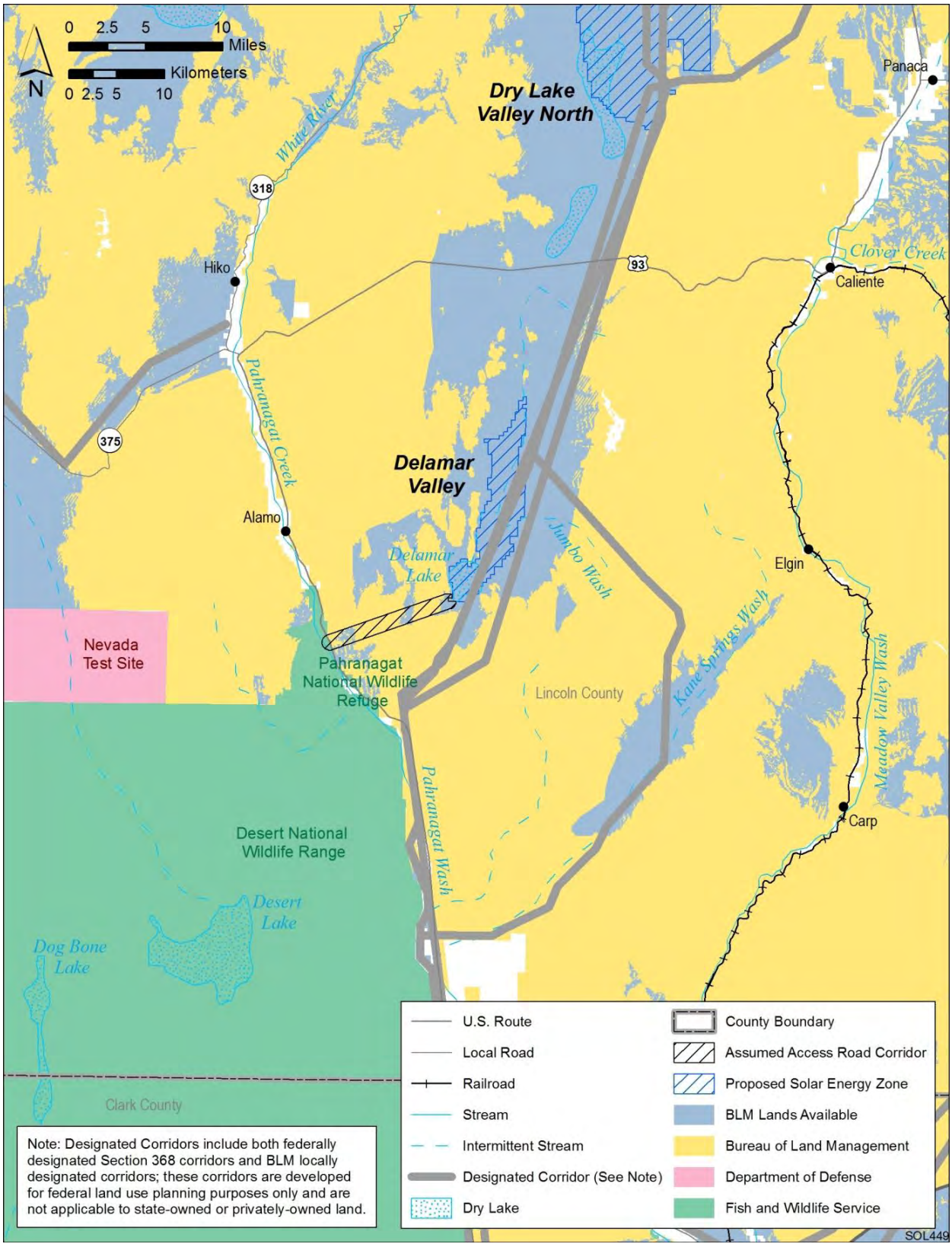

FIGURE B.3.1-1 Proposed Delamar Valley SEZ as Presented in the Draft Solar PEIS

- The U.S. Department of Defense (DoD) expressed serious concern over construction of solar energy facilities within the SEZ, and Nellis Air Force Base indicated that any facilities with structures higher than 100 ft (30 m) may be incompatible with low-level aircraft use of the military training range. The Nevada Test and Training Range (NTTR) indicated that solar technologies requiring structures higher than 50 ft (15 m) above ground level may present unacceptable electromagnetic compatibility concerns for its test mission.

- Impacts on soil resources (e.g., soil compaction, soil horizon mixing, soil erosion by wind and runoff, sedimentation, and soil contamination) could occur. Delamar Lake may not be a suitable location for construction.

- Groundwater use would deplete the aquifer to the extent that, at a minimum, wet-cooling options would not be feasible.

- Clearing of a large portion of the proposed SEZ could primarily affect communities associated with Delamar Lake and other playa habitats, Jumbo Wash and the unnamed intermittent stream, greasewood flats communities, riparian habitats, marshes, or other intermittently flooded areas, depending on the amount of habitat disturbed. Joshua tree communities within the northern portion of the SEZ and within the assumed access road corridor could be directly or indirectly affected. The establishment of noxious weeds could result in habitat degradation. Deposition of fugitive dust could cause reduced productivity or changes in plant community structure

- Potentially suitable habitat for 49 special status species occurs in the affected area of the proposed SEZ; potential impacts on these species and any wildlife species could range from small to large depending on the solar energy technology deployed, the scale of development within the SEZ, and the cumulative rate of groundwater withdrawals.

- If aquatic biota are present in Delamar Lake playa, dry washes, or a nearby marsh, they could be affected by the direct removal of surface water features within the construction footprint, a decline in habitat quantity and quality due to water withdrawals and changes in drainage patterns, as well as increased sediment and contaminant inputs associated with ground disturbance and construction activities.

- Temporary exceedances of ambient air quality standards for particulate matter at the SEZ boundaries are possible during construction. These high concentrations, however, would be limited to the immediate area surrounding the SEZ boundary.

- Although the SEZ is in an area of low scenic quality, strong visual contrasts could be observed by residents nearest to the SEZ. Strong visual contrasts could also be observed by visitors to the Delamar Valley WA, North Delamar

Special Recreation Management Area (SRMA), and the Pahranagat SRMA. Weak to strong visual contrasts could be observed by visitors to the South Pahroc Range WA.

- Few, if any, impacts on significant paleontological resources are likely to occur in 73% of the proposed SEZ, while the potential in the remaining 27% of the SEZ is unknown. The SEZ has a high potential for containing prehistoric sites, especially in the dry lake area at the southern end of the SEZ; thus, direct impacts on significant cultural resources could occur in the proposed SEZ. Indirect impacts on cultural resources outside of the SEZ are possible in rock shelter and petroglyph sites immediately west of the SEZ. Visual impacts on areas of traditional cultural importance could occur.

- Both minority and low-income populations occur within a 50-mi (80-km) radius of the proposed SEZ boundary; thus adverse impacts of solar development could disproportionately affect minority and low-income populations.

B.3.1.2 Summary of Comments Received

Many comments received on the proposed Delamar Valley SEZ were in favor of eliminating the area as an SEZ (N-4 State Grazing Board; DoD; Lincoln County, Nevada; and Western Watersheds Project). Many comments expressed concern for ranching operations in the area and the effect of solar development in the proposed SEZ on grazing allotments in the area.

The Wilderness Society et al.[7] and Nevada Wilderness Project suggested removing the southern end of the SEZ because the sensitive resources in the playa lake make it inappropriate for solar development. The DoD was concerned that any development in the SEZ would have an immediate adverse effect on current and future DoD operations on the NTTR. Lincoln County opposed designation of Delamar Valley as an SEZ because of its potential adverse impacts on water resources, soil resources, vegetation resources, visual resources, recreation, livestock grazing, wildlife, and county socioeconomics. If, however, the SEZ were to be carried forward, Lincoln County recommended that only photovoltaic technologies be considered because of the lack of groundwater resources in the area.

The Nevada Wilderness Project recommended avoiding Joshua tree habitat along the northern portion of the SEZ. The Western Watersheds Project and The Wilderness Society et al. recommended eliminating Delamar Valley as an SEZ because of the region's limited groundwater availability and because the groundwater basin is fully appropriated. The SNWA expressed concern over impacts on ROWs for the Groundwater Development Project.

[7] The Wilderness Society, Center for Biological Diversity, Defenders of Wildlife, Sierra Club–Toiyabe Chapter, National Parks Conservation Association, Natural Resources Defense Council, Soda Mountain Wilderness Council, and Sierra Trek submitted joint comments on the proposed Nevada SEZs. Those comments are attributed to The Wilderness Society et al.

An ethnographic study for the Delamar Valley SEZ area was recently conducted and is summarized in the text box below. The agencies value the information shared by the Tribes during the ethnographic study and will consider their input in striving to minimize the impacts of solar development. The completed ethnographic study will be available in its entirety on the Solar PEIS Web site (http://solareis.anl.gov).

Tribal Perspectives on the Significance of Delamar Valley SEZ

The lands under consideration in the Delamar Valley SEZ region traditionally were occupied and used, aboriginally owned, and historically related to the Numic-speaking peoples of the Great Basin and western Colorado Plateau. Tribes specifically involved in the field consultations that are summarized here are the Moapa Band of Paiute Indians and the Paiute Indian Tribe of Utah, who represent the cultural interests of the Southern Paiute peoples. These Numic-speaking people have gone on record in past projects and continue to stipulate here that they are the American Indian people responsible for the cultural resources (natural and man-made) in this study area because their ancestors were placed here by the Creator and have lived in these lands since time immemorial, maintaining and protecting these places, plants, animals, water sources, and cultural signs of their occupation.

These Numic-speaking peoples further stipulate that because they have lived in these lands since the end of the Pleistocene and throughout the Holocene, or approximately 15,000 years, they deeply understand the dramatic shifts in climate and ecology that have occurred over these millennia. Indian lifeways were dramatically influenced by these natural shifts, but certain religious and ceremonial practices persisted unchanged. The involved American Indian Tribal governments and their appointed cultural representatives have participated in this PEIS in order to explain the meaning and cultural centrality of the plants, animals, spiritual trails, healing places, water, geological resources, and places of historic encounters that exist in these lands.

During the ethnographic field sessions, Tribal representatives identified the Delamar Valley region as being part of a large ceremonial landscape that contains many traditional-use features like hot springs, volcanic places, and important plants and animals. The Delamar Valley SEZ region extends beyond the proposed boundaries of the SEZ and includes the cultural resources in the surrounding landscape. The SEZ study area includes plant communities located within the SEZ boundary, geological features and water sources located just outside the SEZ, and trail systems that people from neighboring or distant communities used to pass through the SEZ study area to reach nearby medicinal and ceremonial areas.

Regional topography is accentuated by high snow-capped and forested mountains whose rain and snow drain into and periodically fill the playa. The combination of water, expansive mountain vistas, white mud earth, and a dark black volcanic ridge produces a landscape that, according to the Indian people, identifies this place as a source of *Puha* (power or energy) and powerful natural and spiritual resources. Places that contain the presence of volcanic activity are considered sacred and powerful. Southern Paiute people believe that volcanic events are moments when Puha deep inside the Earth is brought to the surface as a way for the land to renew itself and to distribute Puha across the landscape.

The power of the topography was also enhanced by the presence of a steep-sided knoll located in the playa just east of the volcanic ridge, which was labeled as Turtle Butte by Indian representatives. Turtle Butte was also identified as a location for vision questing. Vision-questing destinations are selectively marked, and offerings and prayers are left for placation and gratitude. Both remain to indicate the meaning of the place as it was defined at Creation.

Tribal Perspectives on the Significance of Delamar Valley SEZ (Cont.)

The Delamar seasonal playa lake area has been used by Indian people for thousands of years. This is evident, in part, by the large number of heavily weathered and patinated rock peckings located at three places along the eastern side of the volcanic ridge that extends into the seasonal playa lake. A variety of images are found. These include Ocean Woman's net. Ocean Woman is linked to the Creation of all humans and peckings of her net would occur only at ceremonial places. Images of powerful water babies can also be seen. Another ceremony-related pecking is the Knotted String (Stoffle et al. 2004). These occur at places where medicine men or pilgrims travel. Images of The Twins occur as well. They represent the Salt Song sisters who participated in the formation of the trail to the afterlife, which is traveled via about a thousand miles of spiritual and physical paths and places.

The current study was not intended to provide a full interpretation of all the cultural resources associated with the Delamar Valley SEZ region; however, Indian interpretations do present a possible explanation of the traditional functions of the three rock pecking places along the volcanic ridge. It is important to note at the outset that the great majority of the volcanic ridge contains no peckings at all. Thus the three pecking areas discussed here were chosen for a specific purpose, and each had a different function. At the tip of what is called Point of Rocks, the pecking panels were identified as providing directions to travelers either passing through the area or using the area as a destination. For either type of travel it was a point of prayer. The second pecking area centered on the large boulders had a few peckings and an abundance of grinding slicks. It was interpreted as a place where people stayed and prepared plant or paint materials for ceremonies. It may have been a place of prayer before people left for a destination. The third and very large pecking area has what amounts to hundreds of peckings of various sizes, styles, and locations. These peckings are delineated from side to side and from top to bottom of the ridge and only occur together. The area was for ceremonies that could have been accomplished on the ridge at this location or were for preparation of an event that could have occurred elsewhere such as the steep-sided butte in the seasonal lake.

Finally, during multiple field visits, Tribal representatives identified 19 traditional use plants and 42 traditional use animals within the SEZ study area. The presence of these plants and animals adds to the study area's cultural importance because they are associated with medicine, ceremony, and Creation.

B.3.1.3 Rationale for Eliminating the SEZ

On the basis of public comments received on the Draft Solar PEIS, review by the U.S. Department of the Interior Bureau of Land Management (BLM), and continued review of potential impacts identified in the Draft Solar PEIS, the Delamar Valley SEZ will be eliminated from further consideration and will not be identified as an SEZ in applicable land use plans. The potential impacts from solar development in the proposed Delamar Valley SEZ were considered sufficient reason to eliminate the area from further consideration as an SEZ.

Although the area will be dropped from consideration as an SEZ, the lands that composed the proposed Delamar Valley SEZ will be retained as solar ROW variance areas, because the BLM expects that individual projects could be sited in this area to avoid and/or minimize impacts. Any solar development within this area in the future would require appropriate environmental analysis.

B.3.2 East Mormon Mountain

B.3.2.1 Summary of Potential Impacts Identified in the Draft Solar Programmatic Environmental Impact Statement (PEIS)

The proposed East Mormon Mountain solar energy zone (SEZ), as presented in the Draft Solar PEIS, had a total area of 8,968 acres (36 km^2). It is located in Lincoln County in southern Nevada (Figure B.3.2-1). The nearest towns are the cities of Mesquite and Bunkerville, approximately 13 mi (21 km) southeast and south–southeast of the SEZ, respectively.

The Draft Solar PEIS also identified Interstate-15, about 11 mi (18 km) southeast of the SEZ, as the nearest major road and assumed that a new access road would be constructed from the proposed SEZ to I-15 to support development.

Potential environmental and other impacts identified in the Draft Solar PEIS included the following:

- Solar development could sever existing roads and trails that access the SEZ and make it difficult to access undeveloped public lands within and to the west of the SEZ.

- Visual impacts of solar energy development would have the potential to affect wilderness characteristics of the Mormon Mountains Wilderness Area (WA). A new access road would pass through the Mormon Mountain Area of Critical Environmental Concern (ACEC), causing fragmentation of the ACEC.

- If full solar development would occur in the SEZ, the Gourd Springs allotment would be reduced in area by about 9.1%. Because the SEZ would occupy the best grazing land in the allotment, it is likely that the grazing operation would become economically infeasible and all 3,458 animal unit months currently authorized would be lost.

- There may be some loss of wilderness recreational opportunities in up to 9.7% of the Mormon Mountains WA.

- The U.S. Department of Defense (DoD) indicated that solar technologies with structures higher than 200 ft (61 m) would intrude into military airspace and would present safety concerns for military aircraft.

- Impacts on soil resources (e.g., soil compaction, soil horizon mixing, soil erosion by wind and runoff, sedimentation, and soil contamination) could occur.

- Groundwater use would deplete the aquifer to the extent that, at a minimum, wet-cooling options would not be feasible.

FIGURE B.3.2-1 Proposed East Mormon Mountain SEZ as Presented in the Draft Solar PEIS

- Clearing of a large portion of the proposed SEZ could primarily affect playa habitats, riparian habitats, desert dry washes, or other intermittently flooded areas within or downgradient from solar projects, depending on the amount of habitat disturbed. The establishment of noxious weeds could result in habitat degradation. Deposition of fugitive dust could cause reduced productivity or changes in plant community structure.

- Potentially suitable habitat for 32 special status species occurs in the affected area of the proposed SEZ; less than 1.0% of the potentially suitable habitat for any of these species and any wildlife species occurs in the region that would be directly affected by development.

- If aquatic biota are present, they could be affected by the direct removal of surface water features within the construction footprint, a decline in habitat quantity and quality due to water withdrawals and changes in drainage patterns, as well as increased sediment and contaminant inputs associated with ground disturbance and construction activities.

- Temporary exceedances of ambient air quality standards for particulate matter at the SEZ boundaries are possible during construction. These high concentrations, however, would be limited to the immediate area surrounding the SEZ boundary.

- Although the SEZ is in an area of low scenic quality, strong visual contrasts could be observed by visitors to the Mormon Mountains WA.

- Few, if any, impacts on significant paleontological resources are likely to occur in the proposed SEZ. Areas near Toquop Wash and South Fork have considerable potential for containing significant sites; thus, direct impacts on significant cultural resources could occur in the proposed SEZ. Visual impacts on the Old Spanish National Historic Trail are possible, as well as visual and auditory effects on nearby rock art sites. The proposed SEZ does include plants and animals traditionally important to Native Americans.

B.3.2.2 Summary of Comments Received

Most of the comments received on the proposed East Mormon Mountain SEZ were in favor of eliminating the area as an SEZ (N-4 State Grazing Board; Lincoln County, Nevada; and Western Watersheds Project). However, the Nevada Wilderness Project and The Wilderness Society et al.[8] supported designating the area as an SEZ. Many comments expressed concern for

[8] The Wilderness Society, Center for Biological Diversity, Defenders of Wildlife, Sierra Club–Toiyabe Chapter, National Parks Conservation Association, Natural Resources Defense Council, Soda Mountain Wilderness Council, and Sierra Trek submitted joint comments on the proposed Nevada SEZs. Those comments are attributed to The Wilderness Society et al.

ranching operations in the area and the effect of solar development in the proposed SEZ on grazing allotments in the area.

The DoD recommended that any solar energy technologies that require structures higher than 700 ft (1,127 m) above ground level receive additional analysis. Lincoln County opposed designation of East Mormon Mountain as an SEZ because of its potential adverse impacts on the Mormon Mesa ACEC, specially designated lands with wilderness characteristics and designated by Congress, livestock grazing, recreation, DoD operating areas, sensitive soil, water and vegetation resources, designated critical habitat for federally endangered species, and visual resource values.

The Western Watersheds Project recommended eliminating East Mormon Mountain as an SEZ, because the SEZ includes desert tortoise habitat and is immediately adjacent to the Mormon Mesa Desert Wildlife Management Area (DWMA) and Beaver Dam Slope DWMA in the Northeastern Mojave recovery unit. The Nature Conservancy recommended avoiding the Toquop Wash, because it is a regionally important desert wash containing many of the Mojave Desert ecoregionally significant plant and animal species.

An ethnographic study for the East Mormon Mountain SEZ area was recently conducted and is summarized in the text box below. The agencies value the information shared by the Tribes during the ethnographic study and will consider their input in striving to minimize the impacts of solar development in the SEZ. The completed ethnographic study will be available in its entirety on the Solar PEIS Web site (http://solareis.anl.gov).

Tribal Perspectives on the Significance of East Mormon Mountain SEZ

The lands under consideration in the East Mormon Mountain SEZ were traditionally occupied and used, aboriginally owned, and historically related to the Numic-speaking peoples of the Great Basin and western Colorado Plateau. People specifically involved in the Solar PEIS field consultations summarized here are from the Moapa Band of Paiute Indians who are representing the cultural interests of the Southern Paiute peoples. The Solar PEIS investigation includes areas that were studied during previous ethnographic research that also involved the Kaibab Band of Paiute Indians, the Paiute Indian Tribe of Utah, the Pahrump Band of Paiute Indians, the Duckwater Shoshone Tribe, and the Confederated Tribes of the Goshute Indian Reservation (Stoffle et al. 1982, 1983).

Numic-speaking peoples have gone on record in past projects and stipulate again here that they are the American Indian peoples responsible for the cultural resources (natural and manmade) in this study area, because their ancestors were placed here by the Creator and subsequently have lived in these lands, maintaining and protecting these places, plants, animals, water sources, and cultural signs of their occupation.

These Numic-speaking peoples further stipulate that because they have lived in these lands since the end of the Pleistocene and throughout the Holocene (or approximately 15,000 years), they deeply understand the dramatic shifts in climate and ecology that have occurred over these millennia. Indian lifeways were dramatically influenced by these natural shifts, but certain religious and ceremonial practices persisted unchanged. These traditional ecological understandings are carried from generation to generation through the recounting of origin stories occurring in mythic times and by strict cultural and natural resource conservation rules. The involved American Indian Tribal governments and their appointed cultural representatives have participated in this PEIS

Tribal Perspectives on the Significance of East Mormon Mountain SEZ (Cont.)

in order to explain the meaning and cultural centrality of the plants, animals, spiritual trails, healing places, and places of historic encounters that exist in these lands.

Central to the American Indian interpretation of the proposed SEZ is the Mormon Mountains massif, which is about 26 mi (42 km) long from north to south and 17 mi (27 km) wide. It lies about 15 mi (24 km) west of East Mormon Mountain SEZ.

A central feature of this region is a hydrological path that begins in the high mountains and follows South Fork Toquop Wash and Toquop Wash to the Virgin River. Along this path are traditional spiritual trails known as *Puha* Paths. From distant communities, including those along the Virgin and Colorado rivers, these paths were utilized to seek power in the mountains. These activities have occurred since Creation. Along these *Puha* Paths, places were marked where special activities occurred. This is exemplified by the peckings and paintings that are found in the South Fork Toquop Wash, the paintings in Caliche Caves, and the presence of artifacts throughout the area.

Potato Woman is a long ridge located at the southwestern edge of the Mormon Mountain massif, some 23 mi (37 km) SW of the SEZ. Southern Paiute people associate Potato Woman with Creation and a mountain sheep origin story. Potato Woman is known as a powerful place—so powerful that traditionally Indian people would not live or camp near her.

Toquop Wash is located 3.5 mi (5.6 km) west of the East Mormon Mountain SEZ. Tribal representatives believed that this place is connected to the study area and both are part of the larger Mormon Mountain cultural landscape. Toquop Wash is a *Puha* connector that the Paiute people believe was used to travel to various destinations in the Mormon Mountains massif. The Toquop Wash system connects both East Mormon Mountain (via South Fork Toquop Wash) and the Clover Mountains (via Toquop Wash) to the Virgin River and beyond.

Southern Paiute representatives interviewed during the Mormon Mountain Oral History study and the Solar PEIS ethnographic studies discussed how they believe places like Toquop Wash were located along a trail system that connected Southern Paiute communities along the Virgin River to ceremonial places in the Mormon Mountains. The trail began at the junction of the wash and the river and follows the wash past the South Toquop Wash Pecking Site to Mormon Peak. Pilgrimage trails can be predicted by using Southern Paiute place logic. For example, knowing that people follow pilgrimage trails to powerful destination places, one knows that the trail must follow that natural flow of water in order to pass through places with high levels of *Puha*. A pilgrimage trail passes by a water source, a place of volcanic activity, and through some sort of narrow and constricted space. By following these trails, pilgrims travel to isolated places far away from their communities and other people.

The Salt Song Trail traverses through the Mormon Mountains region. The Salt Song Trail is a sacred song trail to the Southern Paiute people that encompasses parts of Nevada, California, Arizona, and Utah (Stoffle et al. 2002). The Salt Song is part of a ceremony known as the Cry, during which the deceased person's soul is guided to the afterlife. It is denoted by specific topographic features and spiritual places. This song trail guides the soul throughout Southern Paiute territory. This song trail is arguably the most important song trail in the Southern Paiute world, in that every person will eventually walk it.

In the historic period, this area may have been a region of refuge. The Mormon Mountains region was specifically sought out because the *Puha* of the caves could protect the most vulnerable individuals from capture, enslavement, or disease (Ruuska et al. 2011).

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Tribal Perspectives on the Significance of East Mormon Mountain SEZ (Cont.)

Finally, during multiple field visits, Native American representatives identified 34 traditional-use plants within the proposed project boundary. The presence of animals in an area contributes to the overall cultural importance of an area to Indian people. One animal that drew particular interest from the cultural representatives was the Desert Horned Lizard, also commonly known as a horned toad. Traditionally, the horned lizard was used as a medicine by Southern Paiute doctors, and the lizard appears in a Creation story. Another animal that drew notice was the mountain sheep. Many mountain sheep stories and songs are also associated with this area. Mountain sheep are believed to be spiritual animals. "Their images are interpreted by Indian people as symbolic of the normal spirit helper of the rain shaman" (Stoffle et al. 2002).

B.3.2.3 Rationale for Eliminating the SEZ

On the basis of public comments received on the Draft Solar PEIS, review by the U.S. Department of the Interior Bureau of Land Management (BLM), and continued review of potential impacts identified in the Draft Solar PEIS, the East Mormon Mountain SEZ will be eliminated from further consideration and will not be identified as an SEZ in applicable land use plans. The potential impacts from solar development in the proposed East Mormon Mountain SEZ were considered sufficient reason to eliminate the area from further consideration as an SEZ.

Although the area will be dropped from consideration as an SEZ, the lands that composed the proposed East Mormon Mountain SEZ will be retained as solar right-of-way variance areas, because the BLM expects that individual projects could be sited in this area to avoid and/or minimize impacts. Any solar development within this area in the future would require appropriate environmental analysis.

B.4 NEW MEXICO

B.4.1 Mason Draw

B.4.1.1 Summary of Potential Impacts Identified in the Draft Solar Programmatic Environmental Impact Statement (PEIS)

The proposed Mason Draw solar energy zone (SEZ), as presented in the Draft Solar PEIS, had a total area of 12,909 acres (52 km^2). It is located in Doña Ana County in southern New Mexico (Figure B.4.1-1). The nearest towns of Doña Ana, Las Cruces, Mesilla, Picacho, and University Park are at least 12 mi (19 km) from the SEZ. The nearest residences to the SEZ are about 3 mi (5 km) to the east.

Potential environmental and other impacts identified in the Draft Solar PEIS included the following:

- The historic setting of the route of the Butterfield Trail would be adversely affected by construction of solar facilities in the SEZ; this impact would be difficult to mitigate. There would be minor adverse impacts on scenic and recreational resources in the Prehistoric Trackways National Monument and the Robledo Mountains Wilderness Study Area and Area of Environmental Concern.

- The grazing permits for the Corralitos Ranch grazing allotment would be reduced, and a maximum of 970 animal unit months would be lost.

- Areas developed for solar energy production would be closed to recreational use, resulting in lost opportunities for backcountry driving, hiking/walking, bird-watching, and hunting.

- The U.S. Department of Defense indicated that solar technologies with structures higher than 100 ft (30 m) would adversely affect military airspace.

- Impacts on soil resources (e.g., soil compaction, soil horizon mixing, soil erosion by wind and runoff, sedimentation, and soil contamination) could occur.

- Groundwater use would deplete the aquifer to the extent that, at a minimum, wet-cooling options would not be feasible.

- Clearing of a large portion of the proposed SEZ could affect wetland, dry wash, woodland, playa, and riparian habitats, depending on the amount of habitat disturbed. The establishment of noxious weeds could result in habitat degradation.

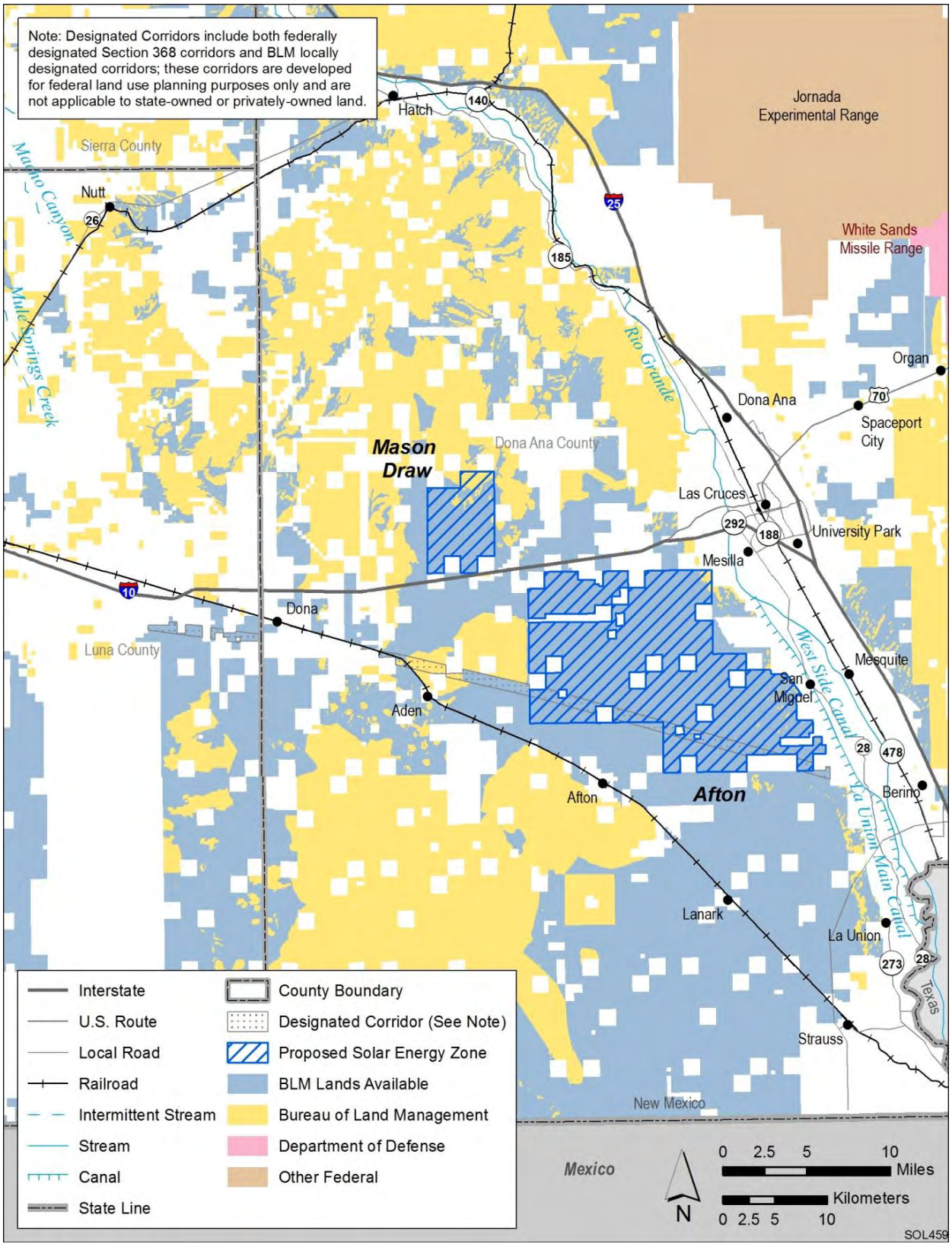

FIGURE B.4.1-1 Proposed Mason Draw SEZ as Presented in the Draft Solar PEIS

- Potentially suitable habitat for 29 special status species occurs in the affected area of the proposed SEZ; less than 1.0% of the potentially suitable habitat for any of these species and any wildlife species occurs in the region that would be directly affected by development.

- If aquatic biota are present, they could be affected by the direct removal of surface water features within the construction footprint, a decline in habitat quantity and quality due to water withdrawals and changes in drainage patterns, as well as increased sediment and contaminant inputs associated with ground disturbance and construction activities.

- During construction, temporary exceedances of ambient air quality standards for particulate matter at the SEZ boundaries are possible. These high concentrations, however, would be limited to the immediate area surrounding the SEZ boundary.

- Although the SEZ is in an area of low scenic quality, strong visual contrasts could be observed by visitors to the Butterfield Trail and for travelers on Interstate-10 (I-10), I-25, and I-70. Moderate to strong visual contrasts could be observed by visitors to the Aden Hills Special Recreation Management Area.

- The potential for impacts on significant paleontological resources in the proposed SEZ is unknown but could be high. Direct impacts on significant cultural resources could occur in the proposed SEZ, especially in dune areas. Visual impacts on two trail systems, including a National Historic Trail would occur. The nearby Potrillo Mountains provided home bases for some Chiricahua groups. Views from these mountains may be of cultural importance.

- Minority populations occur within a 50-mi (80-km) radius of the proposed SEZ boundary; thus adverse impacts of solar development could disproportionately affect minority populations.

B.4.1.2 Summary of Comments Received

Of the comments received on the proposed Mason Draw SEZ, most were in favor of eliminating the area as an SEZ (New Mexico Department of Game and Fish [NMDGF]). Others supported designating the area as an SEZ, provided boundary adjustments were made. The Mesilla Valley Audubon Society and The Wilderness Society et al.[9] supported designating the

[9] The Wilderness Society, New Mexico Wilderness Alliance, Defenders of Wildlife, Audubon New Mexico, Gila Resources Information Project, Gila Conservation Coalition, Western Environmental Law Center, Southwest Environmental Law Center, Upper Gila Watershed Alliance, Sierra Club, Natural Resources Defense Council, Soda Mountain Wilderness Council, and Sierra Trek submitted joint comments on the proposed New Mexico SEZs. Those comments are attributed to The Wilderness Society et al.

area as an SEZ if the boundary were adjusted to exclude the Sleeping Lady Hills unit of New Mexico Wilderness Alliance's Citizens' Proposed Wilderness Inventory.

The New Mexico Department of Agriculture expressed concern for ranching operations in the area and the disproportionate burden that would be placed on ranchers if development occurred on the SEZ. The NMDFG supported elimination of the Mason Draw SEZ, because of the presence of large areas of intact native grassland of the Chihuahuan Semi-Desert Grasslands type, and populations of antelope, quail, and doves that make the area a popular and high-quality hunting and wildlife-watching recreational resource. The Wilderness Society et al. also had concerns about impacts on wildlife and wildlife habitat, including pronghorn, mule deer, and Aplomado falcon, as well as overlap of the SEZ with a the portion of the Goodsight Mountains' Citizens' Proposed Wilderness Area on the northern end of the unit. The Full Circle Heritage Services recommended a robust Endangered Species Act and Section 106 consultation process.

B.4.1.3 Rationale for Eliminating the SEZ

On the basis of public comments received on the Draft Solar PEIS, review by the U.S. Department of the Interior Bureau of Land Management (BLM) and continued review of potential impacts identified in the Draft Solar PEIS, the Mason Draw SEZ will be eliminated from further consideration and will not be identified as an SEZ in applicable land use plans. The potential impacts from solar development in the proposed Mason Draw SEZ were considered sufficient reason to eliminate the area from further consideration as an SEZ.

Although the area will be dropped from consideration as an SEZ, the lands that composed the proposed Mason Draw SEZ will be retained as solar right-of-way variance areas, because the BLM expects that individual projects could be sited in this area to avoid and/or minimize impacts. Any solar development within this area in the future would require appropriate environmental analysis.

B.4.2 Red Sands

B.4.2.1 Summary of Potential Impacts Identified in the Draft Solar Programmatic Environmental Impact Statement (PEIS)

The proposed Red Sands solar energy zone (SEZ), as presented in the Draft Solar PEIS, had a total area of 22,520 acres (91 m^2). It is located in Otero County in south–central New Mexico (Figure B.4.2-1). The towns of Boles Acres and Alamogordo are located about 2 mi (3 km) east and 6 mi (10 km) northeast of the SEZ, respectively.

Potential environmental and other impacts identified in the Draft Solar PEIS included the following:

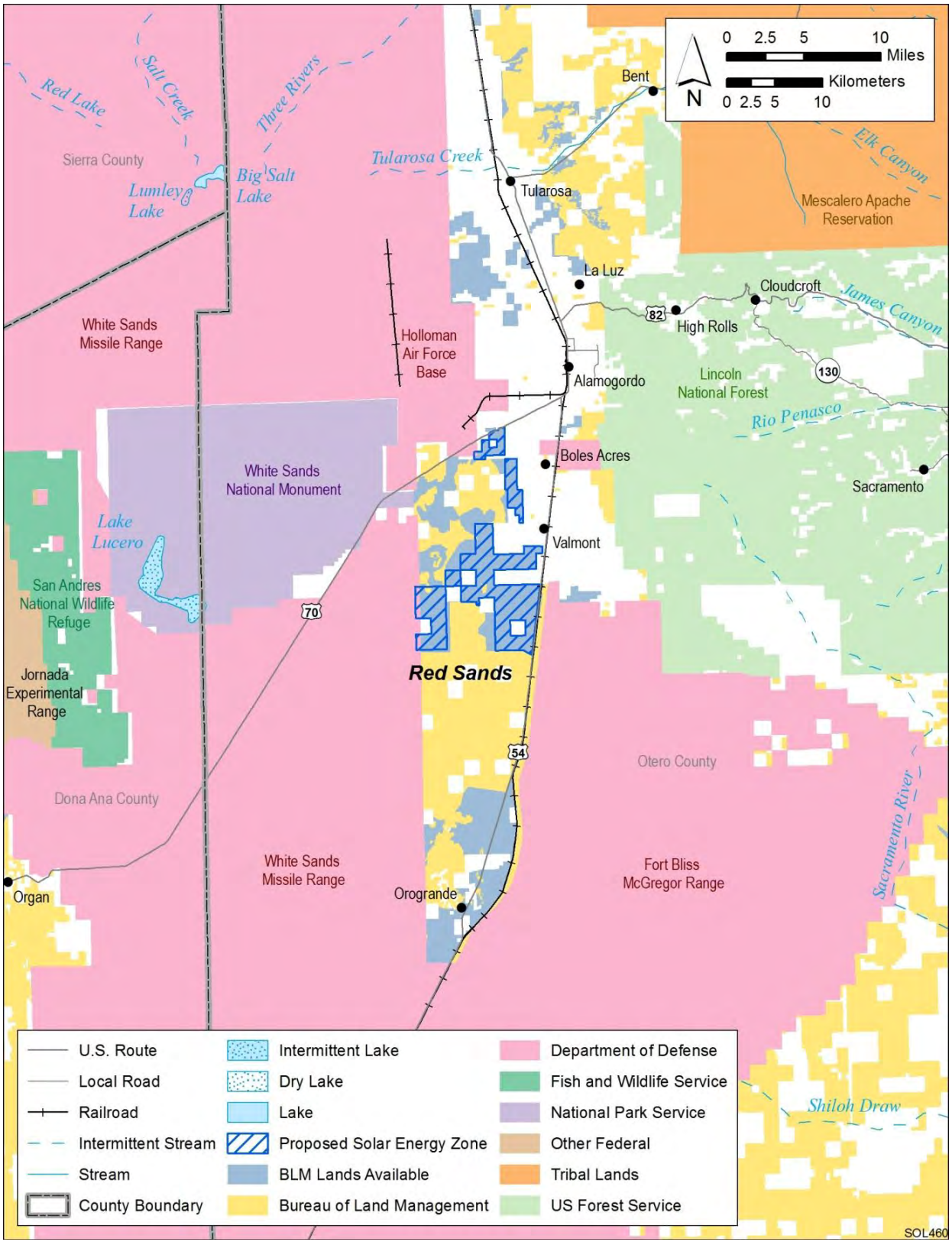

FIGURE B.4.2-1 Proposed Red Sands SEZ as Presented in the Draft Solar PEIS

- Because of the fragmented nature of the SEZ, it is likely that public access routes to lands outside the SEZ would be blocked by solar development.

- Wilderness characteristics in the Culp Canyon Wilderness Study Area (WSA) would be adversely affected. Scenic values and recreational use in the Sacramento Escarpment Area of Environmental Concern (ACEC) and the U.S. Forest Service (USFS) Roadless Areas on the front of the Sacramento Mountains would be adversely affected. Visitors to the eastern and southeastern portions of the White Sands National Monument would have clear views of development in portions of the SEZ and this would have an adverse effect on visitor experience in the monument.

- Grazing permits for the Bar H W Ranch, Diamond A Ranch, Escondido Well, Lone Butte, and White Sands Ranch grazing allotments would be reduced. A maximum of 2,495 animal unit months would be lost.

- Recreational use in the Culp Canyon WSA, Sacramento Escarpment ACEC, White Sands National Monument, and the USFS Roadless Areas would be adversely affected and would not be completely mitigated.

- The U.S. Department of Defense (DoD) expressed concern over any facilities constructed in the SEZ that could affect its current operations, including the potential for flight restrictions above any solar facilities and the height of solar facilities that could interfere with approaches to and departures from Holloman Air Force Base or that would intrude into low-level airspace.

- Impacts on soil resources (e.g., soil compaction, soil horizon mixing, soil erosion by wind and runoff, sedimentation, and soil contamination) could occur.

- Groundwater use would deplete the aquifer to the extent that, at a minimum, wet-cooling options would not be feasible.

- Clearing of a large portion of the proposed SEZ could affect wetland, dry wash, playa, and dune habitats, depending on the amount of habitat disturbed. The establishment of noxious weeds could result in habitat degradation

- Potentially suitable habitat for 43 special status species occurs in the affected area of the proposed SEZ. For most of these species and most wildlife species, less than 1.0% of the potentially suitable habitat occurs in the region that would be directly affected by development. For several special status species and two wildlife species, between 2 and 3% of the potentially suitable habitat in the region occurs in the area of direct effects.

- If aquatic biota are present in wetland, dry wash, riparian, or playa areas of the SEZ, they could be affected by the direct removal of surface water features

within the construction footprint, a decline in habitat quantity and quality due to water withdrawals and changes in drainage patterns, as well as increased sediment and contaminant inputs associated with ground disturbance and construction activities.

- Temporary exceedances of ambient air quality standards for particulate matter at the SEZ boundaries are possible during construction. These high concentrations, however, would be limited to the immediate area surrounding the SEZ boundary.

- Although the SEZ is in an area of low scenic quality, strong visual contrasts could be observed by visitors to the White Sands National Monument, Culp Canyon WSA, Sacramento Escarpment ACEC, Lone Butte, and for travelers on Interstate-70 and U.S. 54. Strong visual contrasts could be observed by residents of the communities of Alamogordo and Boles Acres.

- During construction, noise levels at the nearest residences could be higher than the U.S. Environmental Protection Agency (EPA) guidance levels. During operations, noise levels at the nearest residences could be above EPA guidance levels if concentrating solar power facilities with energy storage technologies (which could extend the daily operational time by 6 hours or more) were used at the SEZ, and equal to EPA guidance levels if dish engine technology were used at the SEZ.

- The potential for impacts on significant paleontological resources in the proposed SEZ is low. Direct impacts on significant cultural resources could occur in the proposed SEZ. The adjacent Sacramento and San Andres Mountains provided home bases for some Mescalero groups. Views from these mountains may be of cultural importance.

- Minority populations occur within a 50-mi (80-km) radius of the proposed SEZ boundary; thus adverse impacts of solar development could disproportionately affect minority populations.

B.4.2.2 Summary of Comments Received

Many comments on the proposed Red Sands SEZ were received. Some commentors were in favor of eliminating the area as an SEZ (e.g., the National Parks Conservation Association, the

Cultural Resources Preservation Council), while others (e.g., the New Mexico Department of Game and Fish and The Wilderness Society et al.[10]) supported designating the area as an SEZ.

The Wilderness Society et al. was concerned that groundwater withdrawals might affect the White Sands pupfish. The Cultural Resources Preservation Council (CRPC) recommended that the U.S. Department of the Interior Bureau of Land Management (BLM) modify the boundaries or drop the SEZ entirely. The CRPC also suggested that the BLM work closely with affected Tribes to determine whether development of the SEZ could cause adverse impacts on sacred viewsheds and whether those impacts could be adequately mitigated. The National Parks Conservation Association favored eliminating the Red Sands SEZ because development within the SEZ could jeopardize groundwater at White Sands National Monument, and because it would have adverse impacts on the development and stability of the gypsum sand dunes and on visual resources of the White Sands National Monument. The DoD recommended that no power tower facilities be allowed in the SEZ.

B.4.2.3 Rationale for Eliminating the SEZ

On the basis of public comments received on the Draft Solar PEIS, review by the BLM, and continued review of the potential impacts identified in the Draft Solar PEIS, the Red Sands SEZ will be eliminated from further consideration and will not be identified as an SEZ in applicable land use plans. The potential impacts from solar development in the proposed Red Sands SEZ were considered sufficient reason to eliminate the area from further consideration as an SEZ.

Although the area will be dropped from consideration as an SEZ, the lands that composed the proposed Red Sands SEZ will be retained as solar right-of-way variance areas, because the BLM expects that individual projects could be sited in this area to avoid and/or minimize impacts. Any solar development within this area in the future would require appropriate environmental analysis.

B.5 REFERENCES

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[10] The Wilderness Society, New Mexico Wilderness Alliance, Defenders of Wildlife, Audubon New Mexico, Gila Resources Information Project, Gila Conservation Coalition, Western Environmental Law Center, Southwest Environmental Law Center, Upper Gila Watershed Alliance, Sierra Club, Natural Resources Defense Council, Soda Mountain Wilderness Council, and Sierra Trek submitted joint comments on the proposed New Mexico SEZs. Those comments are attributed to The Wilderness Society et al.

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APPENDIX C:

ACTION PLANS FOR SOLAR ENERGY ZONES TO BE CARRIED FORWARD

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APPENDIX C:

ACTION PLANS FOR SOLAR ENERGY ZONES TO BE CARRIED FORWARD[1]

Following completion of the Draft Solar Programmatic Environmental Impact Statement (PEIS), the U.S. Department of the Interior Bureau of Land Management (BLM) has reviewed public comments on the proposed solar energy zones (SEZs) and conducted some additional analysis. As a result, the BLM has decided to drop some SEZs from further consideration as part of the Solar PEIS (see Appendix B of this Supplement). The BLM has also decided to adjust the boundaries of some SEZs that will be carried forward in the Solar PEIS and to identify, as necessary, appropriate non-development areas within SEZs. A summary of proposed changes for the SEZs being carried forward is provided in Table C-1.

The Solar PEIS provides in-depth data collection and environmental analysis for proposed SEZs. The primary purpose of this rigorous analysis is to provide documentation from which the BLM can tier future project authorizations, thereby limiting the required scope and effort of project-specific National Environmental Policy Act of 1969 (NEPA) analyses in these areas. As requested by commentors on the Draft Solar PEIS, the BLM is committed to collecting additional SEZ-specific resource data and conducting additional analysis in order to more effectively facilitate future development in SEZs. Note that additional data and analysis will help facilitate development in SEZs but is not required to identify an area as an SEZ as part of the BLM's Solar Energy Program (see Supplement Section 1.5.1).

The BLM has developed action plans for each SEZ that it has decided to carry forward in the Final Solar PEIS; these action plans are presented by state in Sections C.1 through C.6 of this appendix. Section C.7 presents additional analyses generally applicable to all of the SEZs. Section C.7.1 presents a methodology for a proposed revised transmission analyses for all of the SEZs; Section C.7.2 presents a proposed water resources action plan for all of the SEZs; and Section C.7.3 presents revised mitigation measures to address visual resource impacts that would be applicable to some of the SEZs.

Action plans describe data gaps for individual SEZs and propose data sources and methods for collecting additional data. The BLM will prioritize the collection of additional data and analysis in those SEZs that are most likely to be developed in the near future. Some of the items identified in the action plans will be completed by the BLM and presented in the Final Solar PEIS. Data collection not completed by the BLM (as part of the Final Solar PEIS or through other efforts) would likely be required of developers as part of site-specific tiered analysis for future projects.

Data relative to SEZs going forward will be verified and updated as needed prior to the Final Solar PEIS. New information and updated impact analyses resulting from changes in the SEZs described in the sections below will also be presented in the Final Solar PEIS. For example, new viewshed analyses will be run based on the revised boundaries and proposed technology limitations for the SEZs, and impacts on grazing allotments will be updated.

[1] In this appendix, acronyms are defined in each subsection to facilitate use of the subsections as individual resources.

TABLE C-1 Summary of Changes for SEZs Being Carried Forward

State	SEZ	Area from Draft PEIS (acres)	Revised Area To Be Carried Forward (acres)	Revised Developable Area (acres)	Rationale for Changes
Arizona	Brenda	3,878	No change	3,847	Bouse Wash
	Gillespie	2,618	No change	2,618	NA[a]
California	Imperial East	5,722	No change	5,717	Wetland
	Riverside East	202,896	159,457	147,910	Intermittent lake, major washes, areas identified through approved projects, Joshua Tree National Park, wildlife migration corridor/linkage area
Colorado	Antonito Southeast	9,729	No change	9,712	Wetland, lake
	De Tilla Gulch	1,522	1,064	1,064	Wildlife, Scenic Byway
	Fourmile East	3,882	2,883	2,882	Cultural resources, Scenic Byway, National Historic Trail, wildlife, riparian habitat
	Los Mogotes East	5,918	2,650	2,650	Cultural resources, grazing allotments, riparian area, wildlife, special status species
Nevada	Amargosa Valley	31,625	9.737	8,479	Death Valley National Park, desert tortoise, floodplain
	Dry Lake	15,649	6,186	5,717	Floodplain, wetland, wildlife corridor/linkage area
	Dry Lake Valley North	76,874	28,726	25,069	Sage-grouse, grazing, wetlands/playa
	Gold Point	4,810	No change	4,596	Intermittent stream
	Millers	16,787	No change	16,534	Washes and dry lake areas
New Mexico	Afton	77,623	30,706	29,964	Focus development along existing Section 368 corridor, floodplain, dry lakes
Utah	Escalante Valley	6,614	No change	6,533	Dry lake, dune area
	Milford Flats South	6,480	No change	6,252	Minersville Canal
	Wah Wah Valley	6,097	No change	5,873	Wah Wah wash
Total		677,384		285,417	

[a] NA = not applicable.

C.1 ARIZONA PROPOSED SOLAR ENERGY ZONES

C.1.1 Brenda

C.1.1.1 Summary of Potential Impacts Identified in the Draft Solar Programmatic Environmental Impact Statement (PEIS)

The proposed Brenda solar energy zone (SEZ), as presented in the Draft Solar PEIS, had a total area of 3,878 acres (16 km^2). It is located in La Paz County in west-central Arizona (Figure C.1.1-1). The towns of Quartzsite and Salome in La Paz County are about 18 mi (29 km) west of, and 18 mi (29 km) east of, the SEZ, respectively.

The Draft Solar PEIS identified a 161-kV transmission line 19 mi (31 km) west of the SEZ as the nearest point for connection of the SEZ to the grid. Updated data indicate that a 500-kV transmission line exists 12 mi (19 km) from the SEZ. Details on the revised transmission impact assessment to be included in the Final Solar PEIS are provided in Section C.7.1 of this appendix. Analysis of transmission lines and/or access roads will be completed, as necessary, as part of the project-specific environmental reviews (see Section 2.2.2.2.2 of this Supplement).

Potential adverse impacts identified in the Draft Solar PEIS included the following:

- Seven specially designated areas within 25 mi (40 km) could be affected by solar energy development.
- Potential loss of 353 animal unit months in the Crowder-Weisser allotment.
- Potential loss of recreational use in the adjacent Plomosa Special Recreation Management Area (SRMA), Kofa and New Water Wilderness Areas (WAs), and Dripping Springs Area of Critical Environmental Concern (ACEC).
- Any development on the SEZ that exceeds 250 ft (76 m) could interfere with military operations in three military training routes that cross the area.
- Impacts on soil resources (e.g., soil compaction, soil horizon mixing, soil erosion and deposition by wind and runoff, sedimentation, and soil contamination) could occur.
- Groundwater use would deplete the aquifer to the extent that, at a minimum, wet-cooling options would not be feasible.
- Clearing of a large portion of the proposed SEZ could adversely affect dry wash, dry wash woodland, chenopod scrub habitats, and saguaro cactus communities, depending on the amount of available habitat disturbed. The

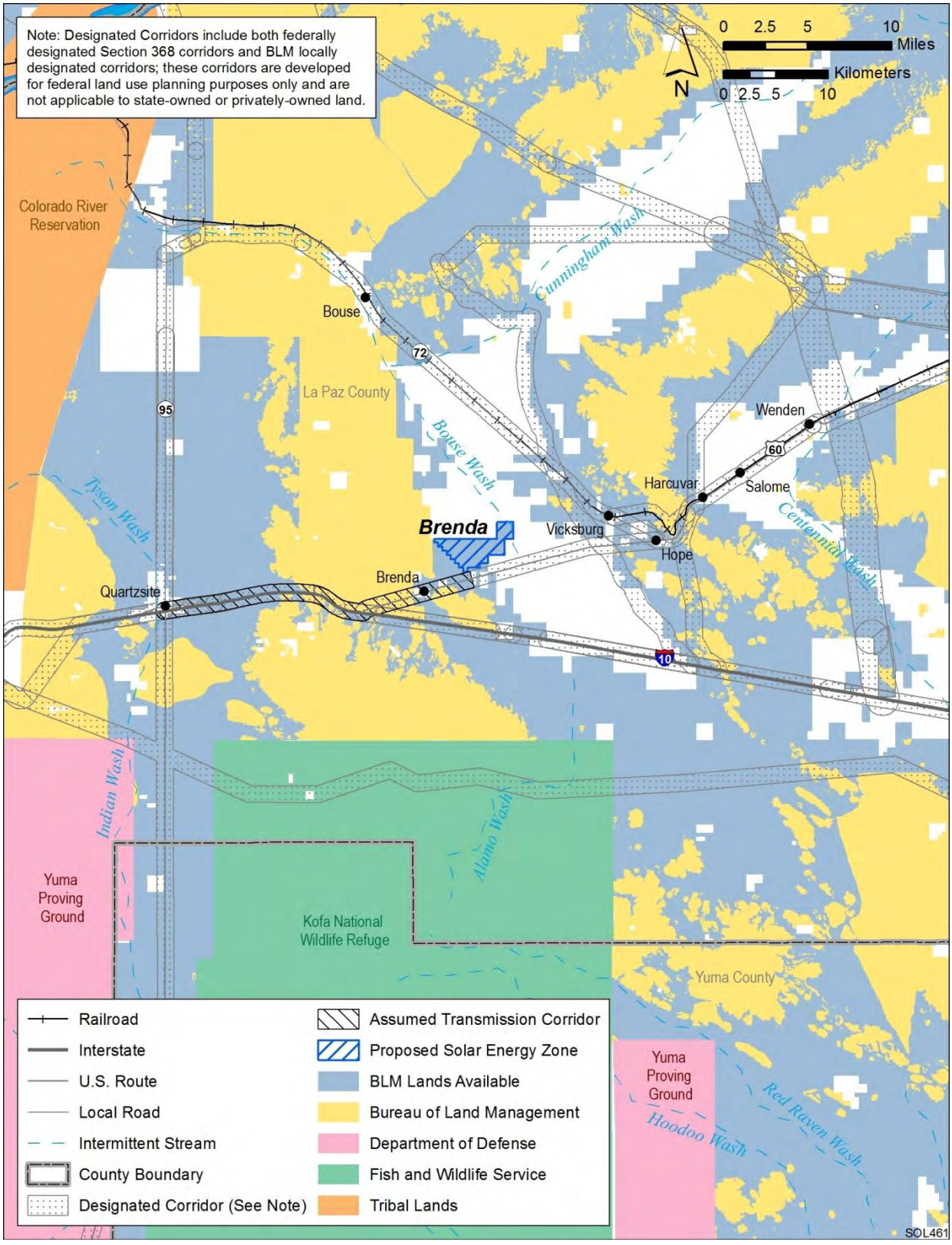

FIGURE C.1.1-1 Proposed Brenda SEZ as Presented in the Draft Solar PEIS (Note: Assumed transmission corridor from the Draft Solar PEIS is no longer applicable.)

establishment of noxious weeds could result in habitat degradation. Deposition of fugitive dust could cause reduced productivity or changes in plant community structure.

- Potentially suitable habitat for 20 special status species and more than 125 wildlife species occurs in the affected area of the proposed SEZ; less than 1% of the potentially suitable habitat for any of these species occurs in the region that would be directly affected by development.

- If aquatic biota are present, they could be affected by the direct removal of these surface water features within the construction footprint. If present, aquatic biota could also be affected by a decline in habitat quantity and quality because of water withdrawals and changes in drainage patterns, as well as increased sediment and contaminant inputs associated with ground disturbance and construction activities.

- Temporary exceedances of ambient air quality standards for particulate matter at the SEZ boundaries are possible during construction; however, these high concentrations would be limited to the immediate area surrounding the SEZ boundary.

- Although the SEZ is in an area of low scenic quality, weak to strong visual contrasts could be observed by visitors to the Plomosa SRMA and residents of Brenda, Hope, and Vicksburg. Strong visual contrasts could be expected for travelers on U.S. 60 and Interstate-10 (I-10).

- During operations, noise levels at the nearest residences would be higher than the U.S. Environmental Protection Agency (EPA) guideline level if concentrating solar power facilities with energy storage technologies (which could extend the daily operational time by 6 hours or more) were used at the SEZ.

- The potential for impacts on significant paleontological and cultural resources is unknown, although the SEZ has the potential for containing prehistoric sites and historic resources. There may be Native American concerns about the potential visual effects of solar energy development within the SEZ on the landscape.

- Minority and low-income populations occur within a 50-mi (80-km) radius of the proposed SEZ boundary; thus adverse impacts of solar development could disproportionately affect minority and low-income populations.

C.1.1.2 Summary of Comments Received

Most of the comments received on the proposed Brenda SEZ were in favor of identifying the area as an SEZ in the applicable land use plan if the design features for water use are followed (The Wilderness Society et al.,[2] Sierra Club, and Tonopah Area Coalition). The Wilderness Society also recommended that soils and desert pavement be left in place and that washes in the northwestern and northeastern portion of the SEZ be avoided. The Tonopah Area Coalition suggested moving the western boundary to the east to avoid a significant wash and recommended low water use to avoid subsidence. The Arizona Department of Environmental Quality indicated that air emissions would be acceptable if the mitigation measures specified are implemented.

C.1.1.3 Changes to the SEZ

No boundary revisions were identified for the proposed SEZ. However, areas specified for non-development under SEZ-specific design features were mapped, where data were available. For the proposed Brenda SEZ, 31 acres (0.13 km^2) of the Bouse Wash in the northeastern portion of the SEZ were identified as non-development areas (see Figure C.1.1-2). The remaining developable area within the SEZ is 3,847 acres (15.6 km^2).

C.1.1.4 Wilderness Character Status of SEZ

A recently maintained inventory of wilderness characteristics was used to determine whether public lands within the Brenda SEZ have wilderness characteristics. The finding of this inventory was that these lands do not contain wilderness characteristics.

C.1.1.5 Additional Data Collection Recommended

C.1.1.5.1 Lands and Realty

None.

C.1.1.5.2 Specially Designated Areas and Lands with Wilderness Characteristics

None.

[2] The Wilderness Society, Sonoran Institute, Sierra Club—Grand Canyon Chapter, Arizona Wilderness Coalition, Tucson Audubon Society, Friends of Ironwood Forest, Defenders of Wildlife, Sky Island Alliance, Grand Canyon Wildlands Council, Soda Mountains Wilderness Council, and Sierra Treks submitted joint comments on the proposed Arizona SEZs. Those comments are attributed to The Wilderness Society et al.

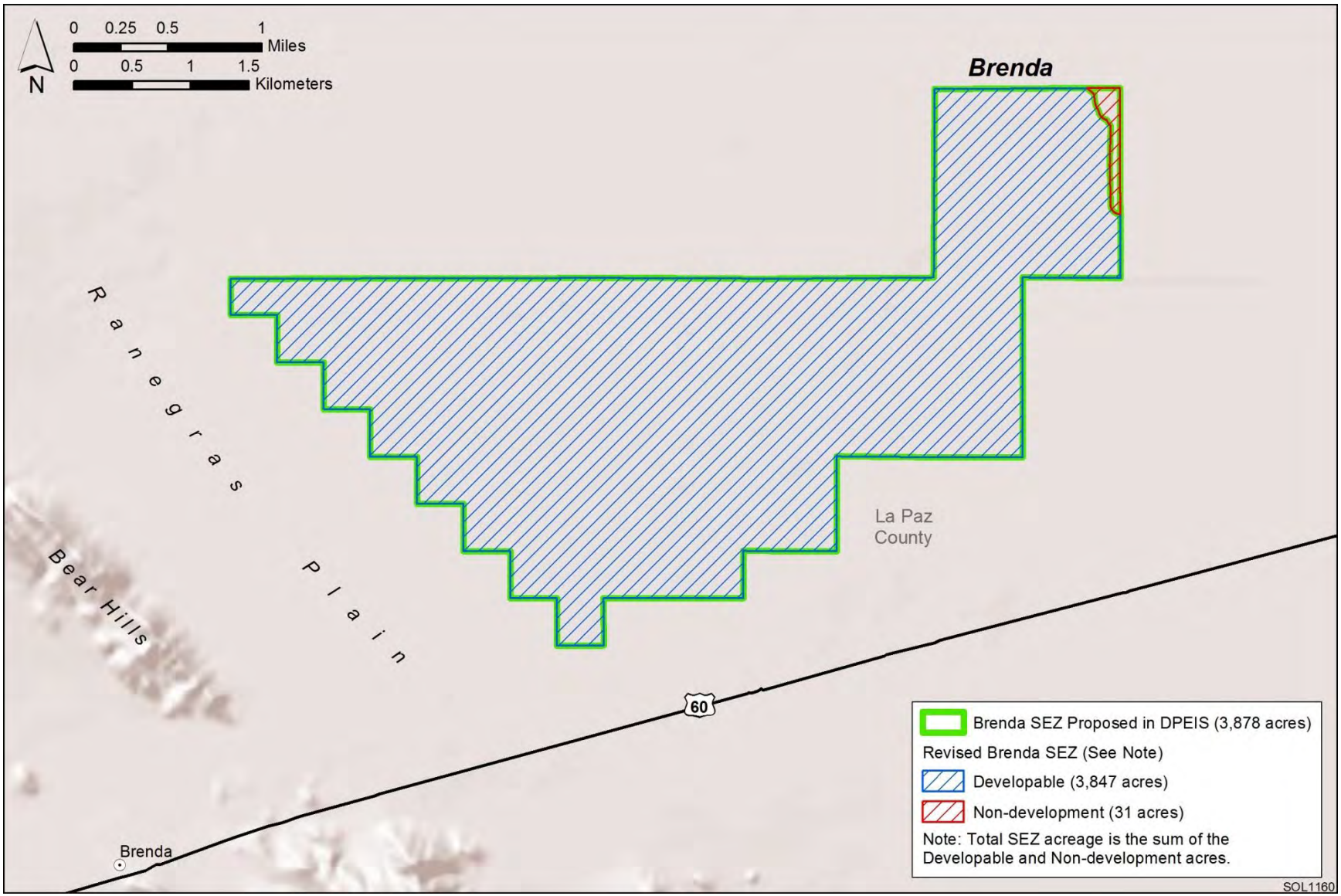

FIGURE C.1.1-2 Proposed Brenda SEZ as Described in this Supplement

C.1.1.5.3 Rangeland Resources

Livestock Grazing. None.

Wild Horses and Burros. None.

C.1.1.5.4 Recreation

The U.S. Department of the Interior Bureau of Land Management (BLM) will conduct a review to determine whether the portion of the SEZ on the west side of the county road should be identified as a non-development area to reduce impacts on the Plomosa SRMA.

C.1.1.5.5 Military and Civilian Aviation

The BLM will continue to consult with the U.S. Department of Defense regarding potential issues with military training routes.

C.1.1.5.6 Geologic Setting and Soil Resources

None.

C.1.1.5.7 Minerals

Additional information on leasable and strategic minerals in the vicinity of the proposed SEZ will be provided in the Final Solar PEIS to inform the Department of the Interior's decision on a proposed 20-year withdrawal of SEZ lands.

C.1.1.5.8 Water Resources

The following additional data and actions would help further characterize potential impacts on water resources for the proposed Brenda SEZ. A more detailed discussion of each of these activities is included in the water resources action plan provided in Section C.7.2 of this appendix.

- Prepare a planning-level water resources inventory of the Renegras Plain Basin.

- Identify additional ephemeral stream channels and alluvial fan features for non-development areas through consultation with BLM Arizona, Arizona

Game and Fish Department (AZGFD), EPA, and U.S. Army Corps of Engineers (USACE) with a focus on:
  - Alluvial fans and ephemeral wash features surrounding the eastern faces of the Plomosa Mountains and the Bear Hills (potential non-development areas; potentially important ecologically), and
  - Bouse Wash.

- Perform field surveys and hydrologic analyses to support jurisdictional water determinations and floodplain identifications. Tasks include:
  - Surveying select stream channels and alluvial fan features for elevations, high water marks, sediment conditions, and
  - Conducting hydrologic rainfall-runoff-routing analyses to identify 100-year floodplain areas.

- Coordinate with the USACE (Los Angeles District) regarding jurisdictional water determinations for the SEZ. Water features to be considered include:
  - Bouse Wash and its tributaries.

- Identify 100-year floodplain non-development areas (if they exist) for Bouse Wash. This task would require coordination with the Federal Emergency Management Agency and the following agencies:
  - Arizona Department of Water Resources (Flood Mitigation Section), and
  - La Paz County.

- Describe the formation of a stakeholder committee to conduct long-term monitoring of water resources. This activity would entail:
  - Identifying key stakeholder agencies,
  - Discussing general features of a monitoring program,
  - Providing recommendations for surface monitoring of ephemeral stream networks, and
  - Working with the U.S. Geological Survey to develop groundwater monitoring well design and numerical groundwater models.

- Develop a simple, numerical groundwater model for the Renegras Plain Basin to evaluate the potential impacts of full build-out. This activity would entail:
  - Assessing the potential for drawdown impacts on the basin, which is already in overdraft, including the potential for land subsidence.

C.1.1.5.9 Ecological Resources

Vegetation and Plant Communities. The following additional data-gathering actions would help further characterize potential impacts on vegetation and plant communities for the proposed Brenda SEZ:

- Identify and map the location and areal extent of desert dry wash, dry wash woodland, and chenopod scrub habitats within the SEZ. Identify and map the location and areal extent of these habitats, as well as mesquite bosque, outside the SEZ that may be affected by hydrologic changes, including groundwater elevations, and changes in water, sediment, and contaminant inputs associated with runoff. Such effort could help determine habitat characteristics, including water source, hydrologic regime, and dominant plant species.

- Identify and map the location and areal extent of saguaro cactus communities within the SEZ.

Wildlife. The following additional data-gathering actions would help further characterize potential impacts on wildlife resources for the SEZ:

- Conduct pre-disturbance surveys within the SEZ to determine the use of the SEZ as a movement/migratory corridor or as important habitat for mule deer.

- Identify and map the extent of wash habitat within the SEZ (see Section C.1.1.5.8 above). These areas are important habitat for a number of wildlife species.

Aquatic Biota. Investigations recommended under the water resources action plan (Section C.1.1.5.8) would be useful in characterizing and protecting habitat available to aquatic biota. Temporary ponding may occur near Bouse Wash, and seasonal aquatic invertebrate communities may be present. Therefore, Bouse Wash could be surveyed for aquatic invertebrates. Other ephemeral surface water features within the Brenda SEZ may or may not contain aquatic biota; therefore, preliminary evaluations of these surface water features could be conducted to determine the potential for aquatic communities to be present.

Special Status Species. The following additional data-gathering actions would be useful in further characterizing and protecting habitat available to special status species:

- Conduct pre-disturbance surveys within the SEZ to determine the presence and abundance of those special status species that are (1) federally listed, proposed for listing, or candidates for listing under the Endangered Species Act (ESA); or (2) designated as sensitive by the Arizona BLM State Office. These species are listed in Table C.1.1-1. Surveys should focus on areas identified as potentially suitable, and the suitability of these habitats to support these special status species should be determined in the field. All field-determined suitable habitats for special status species should be mapped. Target species and survey protocols should be developed in coordination with the USFWS and AZGFD.

TABLE C.1.1-1 Special Status Species That May Occur in the Vicinity of the Proposed Brenda SEZ[a]

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Amphibians			
Lowland leopard frog	*Lithobates yavapaiensis*	BLM-S	Aquatic systems in desert grasslands, pinyon-juniper woodlands, and agricultural areas, including rivers, streams, beaver ponds, springs, earthen cattle tanks, livestock guzzlers, canals, and irrigation sloughs. Nearest recorded quad-level occurrence is approximately 22 mi[d] east of the SEZ. About 189,500 acres[e] of potentially suitable habitat occurs within the SEZ region.
Reptiles			
Desert rosy boa	*Charina trivirgata gracia*	BLM-S	Scrublands, rocky deserts, and canyons with permanent or intermittent streams. Nearest recorded quad-level occurrence is approximately 7 mi east of the SEZ. About 3,583,000 acres of potentially suitable habitat occurs within the SEZ region.
Desert tortoise (Sonoran population)[f]	***Gopherus agassizii***	ESA-C; BLM-S	Desert creosotebush communities on firm soils for digging burrows; often along riverbanks, washes, canyon bottoms, creosote flats, and desert oases. Quad-level occurrences for this species intersect the SEZ. About 3,381,000 acres of potentially suitable habitat occurs within the SEZ region.
Birds			
American peregrine falcon	*Falco peregrinus anatum*	BLM-S	Year-round resident in the SEZ region. Open habitats, including deserts, shrublands, and woodlands that are associated with high, near-vertical cliffs and bluffs above 200 ft.[g] When not breeding, activity is concentrated in areas with ample prey, such as farmlands, marshes, lakes, rivers, and urban areas. Nearest recorded quad-level occurrence is from the vicinity of Alamo Lake, approximately 40 mi northeast of the SEZ. About 4,315,000 acres of potentially suitable habitat occurs within the SEZ region.
Ferruginous hawk	*Buteo regalis*	BLM-S	Winter resident in the SEZ region. Grasslands, sagebrush, and saltbrush habitats, as well as the periphery of pinyon-juniper woodlands throughout the project area. Populations are known to occur in La Paz County, Arizona. About 216,500 acres of potentially suitable foraging habitat occurs within the SEZ region.
Great egret	*Ardea alba*	BLM-S	Year-round resident in the lower Colorado River Valley. Transient in the SEZ affected area. Primarily associated with open water areas such as marshes, estuaries, lagoons, lakes, ponds, rivers and flooded fields. Nearest recorded quad-level occurrence is from the Colorado River, approximately 35 mi west of the SEZ. About 27,700 acres of potentially suitable year-round foraging and nesting habitat occurs within the SEZ region.

TABLE C.1.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Birds (Cont.)			
Western burrowing owl	*Athene cunicularia hypugaea*	BLM-S	Year-round resident in the SEZ region. Open grasslands and prairies, as well as disturbed sites such as golf courses, cemeteries, and airports throughout the SEZ region. Nests in burrows constructed by mammals (prairie dogs, badgers, etc.). Nearest recorded quad-level occurrence is approximately 50 mi southwest of the SEZ. About 4,124,000 acres of potentially suitable habitat occurs within the SEZ region.
Mammals			
California leaf-nosed bat	***Macrotus californicus***	BLM-S	Year-round resident in southern California and southwestern Arizona. May be locally common in some areas. Occurs in desert riparian, desert wash, desertscrub, and palm oasis habitats at elevations below 2,000 ft. Roosts in mines, caves, and buildings. Quad-level occurrences for this species intersect the SEZ. About 3,576,500 acres of potentially suitable habitat occurs within the SEZ region.
Townsend's big-eared bat	*Corynorhinus townsendii*	BLM-S	Near forests and shrubland habitats below 9,000-ft elevation throughout the SEZ region. The species may use caves, mines, and buildings for day roosting and winter hibernation. May be a summer or year-round resident throughout the SEZ region. Nearest recorded quad-level occurrence is approximately 20 mi south of the SEZ. About 4,434,500 acres of potentially suitable habitat occurs within the SEZ region.
Western yellow bat	*Lasiurus xanthinus*	BLM-S	Year-round resident in desert riparian, desert wash, and palm oasis habitats at elevations below 2,000 ft. Roosts in trees. Nearest recorded quad-level occurrence is approximately 20 mi south of the SEZ. About 4,068,000 acres of potentially suitable habitat occurs within the SEZ region.

[a] The listings for (1) federally listed, proposed for listing, or candidates for listing under the ESA, and (2) Arizona BLM State Office sensitive species have been updated since the release of the Draft Solar PEIS.

[b] BLM-S = listed as a sensitive species by the BLM; ESA-C = candidate for listing under the ESA.

[c] For plant species, potentially suitable habitat was determined by using Southwest Regional Gap Analysis Project (SWReGAP) land cover types (USGS 2005). For terrestrial vertebrate species, potentially suitable habitat was determined by using SWReGAP habitat suitability and land cover models. Area of potentially suitable habitat for each species is presented for the SEZ region, which is defined as the area within 50 mi (80 km) of the SEZ center.

[d] To convert mi to km, multiply by 1.609.

[e] To convert acres to km^2, multiply by 0.004047.

[f] Species in bold text have been recorded or have designated critical habitat in the affected area.

[g] To convert ft to m, multiply by 0.3048.

The Draft Solar PEIS presents a table of Special Status Species for which potential impacts need to be evaluated prior to development in the proposed Brenda SEZ. The list of species presented in Table 8.1.12.1-1 of the Draft Solar PEIS also includes species listed by the State of Arizona and species ranked by the State of Arizona as S1 or S2. Based on the design features presented in the Draft Solar PEIS, the potential for impacts on these additional species will also need to be addressed before development could occur in the SEZ.

- Identify and map the location and areal extent of wetland and riparian habitats within the SEZ, including habitat characteristics (such as water source, hydrologic regime, and dominant plant species) both within the wetland boundaries and in adjacent non-wetland habitats. A species potentially associated with these habitats includes the lowland leopard frog.

C.1.1.5.10 Air Quality and Climate

None.

C1.1.5.11 Visual Resources

A summary of the Draft Solar PEIS visual contrast analysis for the proposed Brenda SEZ is provided in Table C.1.1-2. This table includes only those resources that would be subject to moderate or strong visual contrast. The Draft Solar PEIS visual impact analysis predicted these levels of visual contrast from solar energy development in the Brenda SEZ for the following sensitive visual resource areas (SVRAs) and sensitive viewing locations (SVLs):

- New Water Mountains Wilderness Area
- Plomosa Backcountry Byway
- Plomosa Bouse Plain
- Plomosa Mountains
- I-10
- U.S. 60
- Community of Brenda.

TABLE C.1.1-2 Summary of Potential Visual Impacts on SVRAs and SVLs within the 25-mi (40-km) Viewshed of the Proposed Brenda SEZ

Management Area Category	SVRA/SVL within 25 mi[a] of SEZ	Total Acreage/ Mileage[a,b,c] of SVRA/SVL	Distance from SEZ at Point of Closest Approach[d]	Total Acreage/Mileage Visible within 25 mi	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes
WAs	New Water Mountains	24,628 acres	6.5 mi south of the SEZ	4,124 acres	16.7	Minimal to weak levels of visual contrast would be expected, with potentially moderate levels of contrast expected for the highest elevations within the WA that have clear lines of sight to the SEZ. The highest contrast levels would be expected for peaks in the northern part of the WA, with lower contrasts expected for lower elevations and viewpoints in the southern part of the WA. Visibility extends to about 8.5 mi from the southern boundary of the SEZ. The SEZ is visible above the large gap in the Bear Hills southwest of SEZ.
SRMAs	Plomosa Backcountry Byway	5,987 acres	9.2 mi northwest of the SEZ	5,371 acres	89.7	For those portions of the SRMA east of the Plomosa Mountains and within a few miles of the SEZ, strong visual contrasts associated with solar energy development within the SEZ would be expected, while viewpoints farther north in the unit would experience lower levels of contrast as the distance to the SEZ increased. The high peaks in the eastern part of the Plomosa Mountains with clear lines of sight to the SEZ could be subject to moderate to strong impacts depending on distance to the SEZ. Other areas in the SRMA would be subject to lower

TABLE C.1.1-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi[a] of SEZ	Total Acreage/ Mileage[a,b,c] of SVRA/SVL	Distance from SEZ at Point of Closest Approach[d]	Total Acreage/Mileage Visible within 25 mi	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes
SRMAs (Cont.)						levels of contrast, and expected contrast levels for the Plomosa Backcountry Byway unit would be minimal, due primarily to very limited visibility of the SEZ. Visibility extends from the closest approach from the SEZ to about 16 mi within the SRMA.
	Plomosa Bouse Plain	75,085 acres	0.2 mi west of the SEZ	38,228 acres	50.9	For those portions of the SRMA east of the Plomosa Mountains and within a few miles of the SEZ, strong visual contrasts associated with solar energy development within the SEZ would be expected, while viewpoints farther north in the unit would experience lower levels of contrast as the distance to the SEZ increased. The high peaks in the eastern part of the Plomosa Mountains with clear lines of sight to the SEZ could be subject to moderate to strong impacts depending on distance to the SEZ. Other areas in the SRMA would be subject to lower levels of contrast. Visibility extends to about 18 mi from the northwestern boundary of the SEZ.

TABLE C.1.1-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi[a] of SEZ	Total Acreage/ Mileage[a,b,c] of SVRA/SVL	Distance from SEZ at Point of Closest Approach[d]	Total Acreage/Mileage Visible within 25 mi	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes
SRMAs (Cont.)	Plomosa Mountains	28,112 acres	1 mi west of the SEZ	10,579 acres	37.6	For those portions of the SRMA east of the Plomosa Mountains and within a few miles of the SEZ, strong visual contrasts associated with solar energy development within the SEZ would be expected, while viewpoints farther north in the unit would experience lower levels of contrast as the distance to the SEZ increased. The high peaks in the eastern part of the Plomosa Mountains with clear lines of sight to the SEZ could be subject to moderate to strong impacts depending on distance to the SEZ. Other areas in the SRMA would be subject to lower levels of contrast. Visibility extends approximately 6.5 mi from the western boundary of the SEZ.
Other Areas of Interest (non-management areas)	I-10[e]	2,460 mi	Within 3.3 mi and is in the viewshed of the SEZ for about 20 mi	NA[f]	NA	Visual contrasts associated with solar energy development within the SEZ would be highly dependent on viewer location on I-10; solar facility type, size, and location within the SEZ; and other visibility factors. Weak to moderate visual contrast levels would be expected. Approximately 5 mi is located within the 5-mi viewshed.

TABLE C.1.1-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi[a] of SEZ	Total Acreage/ Mileage[a,b,c] of SVRA/SVL	Distance from SEZ at Point of Closest Approach[d]	Total Acreage/Mileage Visible within 25 mi	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes
Other Areas of Interest (non-management areas) (Cont.)	U.S. 60	NA	0.4 mi at the point of closest visible approach	NA	NA	Visual contrasts associated with solar energy development within the SEZ would be highly dependent on viewer location on U.S. 60; solar facility type, size, and location within the SEZ; and other visibility factors. Weak to strong visual contrast levels would be expected. Approximately 13.4 mi is located within the 5-mi viewshed.
	Brenda	NA	2.5 mi southwest of the SEZ	NA	NA	Moderate to strong visual contrast levels would be expected, depending on viewers' locations within Brenda. The far northeastern end of Brenda is 2.3 mi southwest of the SEZ, and the far southwestern end is about 3.1 mi southwest of the SEZ.

[a] To convert mi to km, multiply by 1.609.

[b] To convert acres to km^2, multiply by 0.004047.

[c] Mileage (within all columns) is used only for trails or roads, unless otherwise specified.

[d] Distances are based on the Draft Solar PEIS analysis dated December 2010; any alterations to the SEZ boundaries may result in changes to the distance at the point of closest approach.

[e] Length of I-10: AARoads' Interstate Guide (2006b).

[f] NA = data not available.

The following steps could be taken to better understand potential impacts on these SVRAs and SVLs from solar development in the Brenda SEZ:

- Identify key observation points (KOPs) within these areas through working with the management agency or other local stakeholders.

- Conduct viewshed analyses from the KOPs to determine how much of the SEZ would be in view from each KOP.

- As deemed necessary, based on viewshed analysis results, prepare wireframe Google Earth™ visualizations of hypothetical solar facilities in the SEZ depicting the 80% development scenario to better estimate potential impacts.

This additional analysis may help judge potential visual contrast more accurately for most KOPs. For KOPs of particularly high sensitivity, a site visit with photography and superimposition of the wireframe models onto the photos might be required or desired.

In addition, according to the Draft Solar PEIS, a Visual Resource Inventory (VRI) was conducted for the area, including the Brenda SEZ, in 2010. Data from this evaluation were not available for preparation of the Draft Solar PEIS. Available VRI data at the time consisted of maps dated September 2006 and May 2007. Updated data, to the extent available, will be incorporated into the Final Solar PEIS. If necessary, some additional SVRAs and/or SVLs may need to be evaluated based on these new data.

C.1.1.5.12 Acoustic Environment

None.

C.1.1.5.13 Paleontological Resources

The BLM Regional Paleontologist will be contacted to determine whether additional information is available regarding Potential Fossil Yield Classification (PFYC) identifications in Arizona. A preliminary paleontological survey could be conducted to determine the PFYC of the SEZ, in order to update the temporary assignment of PFYC Class 3b used in the Draft Solar PEIS.

C.1.1.5.14 Cultural Resources and Native American Concerns

None of the proposed Brenda SEZ has been surveyed for cultural resources; thus, absent specific information, impacts are unknown but possible. Prehistoric sites are likely and historic sites related to World War II military activity and ranching/homesteading are also possible within the SEZ. The SEZ is near several BLM-designated areas (ACECs and Special Cultural Resource Management Areas) that are rich in cultural resources. Therefore, potential impacts

could also include visual and auditory impacts on sacred sites and traditional use areas within these designated areas and possible destruction of segments of trails and associated sites. The destruction or degradation of important plant resources and the destruction of habitat or impediments to the movement of culturally important wildlife are also potential impacts of concern within the SEZ.

The following additional data collection efforts could reduce the uncertainty about potential impacts:

- Conduct a Class I literature file search to better understand (1) the site distribution pattern in the vicinity of the SEZ, (2) potential trail networks through existing ethnographic reports, and (3) overall cultural sensitivity of the landscape.

- Conduct a Class II Stratified Random Sample Survey of the SEZ to obtain a 10% sample (roughly 388 acres [1.6 km^2]).[3] Areas of interest, as determined through a Class I review, should also be identified prior to establishing the survey design and sampling strategy. If appropriate, some subsurface testing of dune areas should be considered in the sampling strategy as well.

- Prepare a cultural sensitivity map based on results of the Class II survey and Class I review.

- Continue with government-to-government consultation as described in Section 2.4.3, including follow-up to recent ethnographic studies with Tribes not included in the original studies to determine whether those Tribes have similar concerns. The Brenda SEZ falls in the traditional use area of primarily the Yavapai, Quechan, and Mohave. Potential topics to be discussed during consultation include the Ranegras Plain, Granite Wash Pass, Harquahala Mountains, bighorn sheep, nearby ACECs and Special Cultural Resource Management Areas, and plant and animal resources.

C.1.1.5.15 Socioeconomics and Environmental Justice

None.

C.1.1.5.16 Cumulative Impact Considerations

None.

[3] The BLM plans to conduct a Class II survey of 5% of this SEZ prior to the Final Solar PEIS. Additional areas could be surveyed as funding becomes available.

C.1.2 Gillespie

C.1.2.1 Summary of Potential Impacts Identified in the Draft Solar Programmatic Environmental Impact Statement (PEIS)

The proposed Gillespie solar energy zone (SEZ), as presented in the Draft Solar PEIS, had a total area of 2,618 acres (11 km^2). It is located in Maricopa County in west-central Arizona (Figure C.1.2-1). The towns of Arlington and Buckeye are about 7 mi (11 km) and 17 mi (27 km) northeast of the SEZ, respectively.

The Draft Solar PEIS identified Old U.S. 80, located about 3 mi (5 km) to the east of the SEZ, as the nearest major road, and assumed that a new access road would be constructed from the proposed SEZ to Old U.S. 80 to support development. The location of a new access road that could be constructed in the future may be different from that assumed in the Draft Solar PEIS. The Draft Solar PEIS also identified a 500-kV transmission line adjacent to the SEZ as the nearest point for connection of the SEZ to the grid. Details on the revised transmission impact assessment to be included in the Final Solar PEIS are provided in Appendix C, Section C.7.1 of this appendix. Additional analysis of transmission lines and/or access roads will be completed, as necessary, as part of the project-specific environmental reviews (see Section 2.2.2.2.2 of this Supplement).

Potential adverse impacts identified in the Draft Solar PEIS included the following:

- Wilderness values in the Woolsey Peak and Signal Mountain Wilderness Areas (WAs) would be adversely affected and solar development would contribute to a further reduction in the scenic viewshed of the Saddle Mountain Special Recreation Management Area (SRMA). A new access road would also contribute to adverse impacts on wilderness values.

- There would be about a 15% reduction in future ephemeral grazing authorizations in the Layton grazing allotment.

- Inventoried off-highway vehicle routes in the SEZ would be closed to recreational use; there could be a loss of recreational use in the nearby WAs and SRMA.

- Any development on the SEZ that exceeds 250 ft (76 m) could interfere with U.S. Department of Defense (DoD) operations in the military training route (MTR) that crosses the SEZ.

- Impacts on soil resources (e.g., soil compaction, soil horizon mixing, soil erosion by wind and runoff), sedimentation, and soil contamination) could occur.

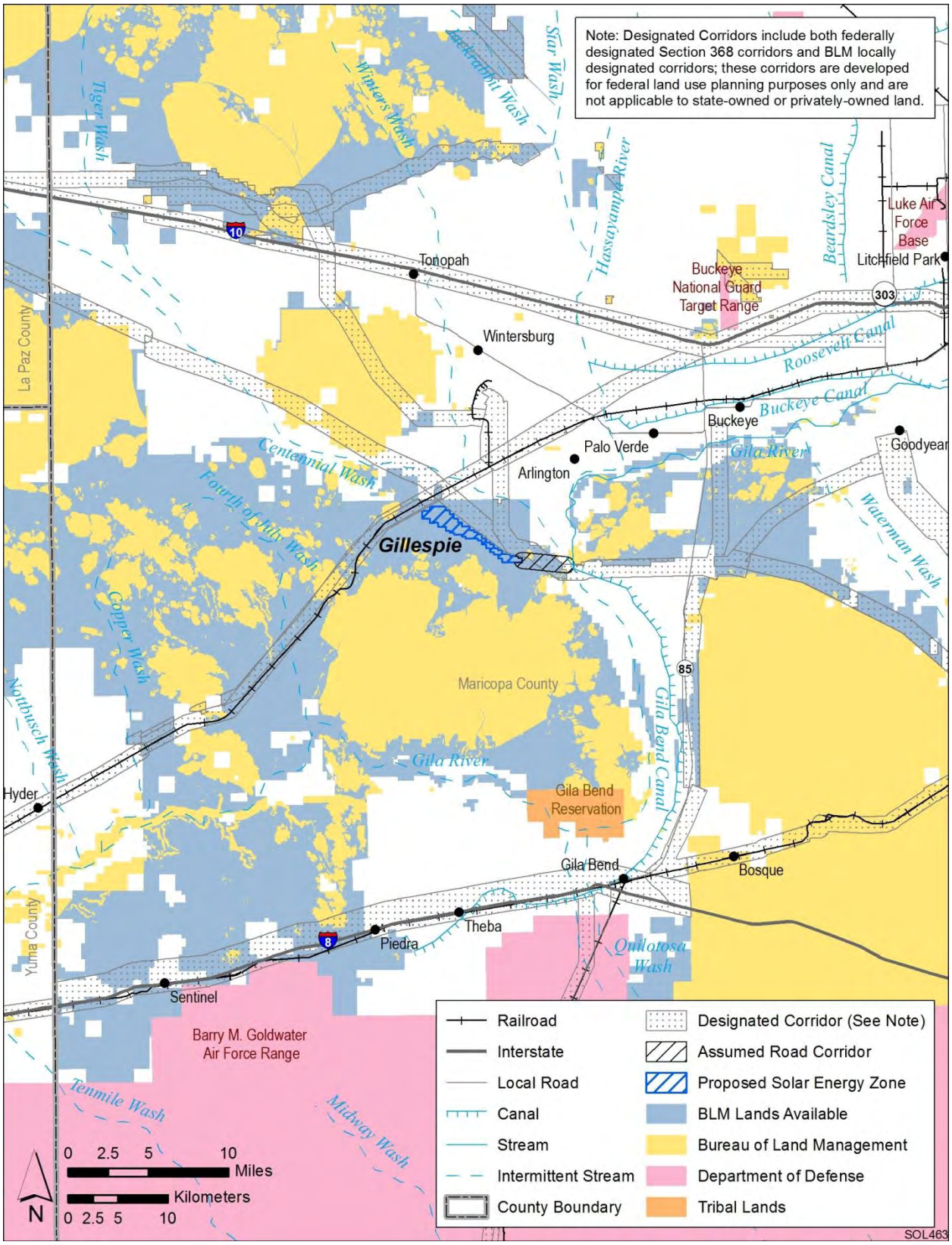

FIGURE C.1.2-1 Proposed Gillespie SEZ as Presented in the Draft Solar PEIS

- Groundwater use would deplete the aquifer to the extent that, at a minimum, wet-cooling options would not be feasible. Clearing of a large portion of the proposed SEZ could adversely affect desert dry washes, dry wash woodland, and wetland habitats, and saguaro cactus communities, depending on the amount of available habitat disturbed.

- Potentially suitable habitat for 29 special status species and more than 125 wildlife species occurs in the affected area of the proposed SEZ; less than 1% of the potentially suitable habitat for any of these species occurs in the region that would be directly affected by development.

- Impacts on aquatic biota could result from the direct removal of ephemeral washes and small wetlands within the construction footprint. Aquatic biota in surface water features could also be affected by a decline in habitat quantity and quality due to water withdrawals and changes in drainage patterns, as well as increased sediment and contaminant inputs associated with ground disturbance and construction activities.

- Temporary exceedances of ambient air quality standards for particulate matter at the SEZ boundaries are possible during construction. These high concentrations, however, would be limited to the immediate area surrounding the SEZ boundary.

- Although the SEZ is in an area of low scenic quality, weak to strong visual contrasts could be observed by visitors to Signal Peak WA, Woolsey Peak WA, and Saddle Mountain SRMA, and travelers on the Agua Caliente Road, Salome Highway and Old U.S. 80. Residents of the town of Arlington could observe strong visual contrasts, and weak visual contrasts could be observed by the residents of the towns of Palo Verde, Buckeye, and Wintersburg. Because of these potential impacts, it was recommended that development of power tower facilities be prohibited within the SEZ.

- The potential for impacts on significant paleontological and cultural resources is unknown. Impacts on cultural resources are also possible in areas related to the assumed access road. Paleontological and cultural resources surveys will likely be needed to identify any potential impacts. It is possible that there will be Native American concerns about the potential visual effects of solar energy development within the SEZ on the landscape, as well as from the elimination of traditionally important plants and animals.

- Minority populations occur within a 50-mi (80-km) radius of the proposed SEZ boundary; thus adverse impacts of solar development could disproportionately affect minority and low-income populations.

C.1.2.2 Summary of Comments Received

Most of the comments received from environmental groups on the proposed Gillespie SEZ were generally in favor of identifying the area as an SEZ, with boundary adjustments (The Wilderness Society et al.[4]). The Wilderness Society et al., Tonopah Area Coalition, and the Sierra Club recommended that the southern boundary be adjusted north of the Agua Caliente Road. The Nature Conservancy suggested that the northwest portion of the Gillespie SEZ be reshaped into a more compact area. The Western Watersheds Project and others expressed concern for visual impacts on the Sonoran Desert National Monument, Signal Peak Wilderness, and Woolsey Peak Wilderness, and suggested that U.S. Department of the Interior Bureau of Land Management (BLM) include the retirement of grazing allotments as a mitigation measure. The Wilderness Society et al. had concerns about groundwater withdrawals and the potential impacts on riparian habitats and species.

C.1.2.3 Changes to the SEZ

No boundary revisions were identified for the proposed SEZ. The Draft Solar PEIS identified potential visual impacts on the Woolsey Peak WA. To reduce the visual resource impacts on this area and on Agua Caliente Road from solar development within the SEZ, allowable solar technologies within the SEZ will be limited to photovoltaic systems with height of panels no greater than 10 ft (3.3 m), or technologies with comparable or lower heights and reflectivity. Additional required mitigation measures to address potential visual resource impacts are given in Section C.7.3 of this appendix.

C.1.2.4 Wilderness Character Status of SEZ

A recently maintained inventory of wilderness characteristics was used to determine whether public lands within the Gillespie SEZ have wilderness characteristics. The finding of this inventory was that these lands do not contain wilderness characteristics.

C.1.2.5 Additional Data Collection Recommended

C.1.2.5.1 Lands and Realty

None.

[4] The Wilderness Society, Sonoran Institute, Sierra Club—Grand Canyon Chapter, Arizona Wilderness Coalition, Tucson Audubon Society, Friends of Ironwood Forest, Defenders of Wildlife, Sky Island Alliance, Grand Canyon Wildlands Council, Natural Resources Defense Council, Soda Mountains Wilderness Council, and Sierra Treks submitted joint comments on the proposed Arizona SEZs. Those comments are attributed to The Wilderness Society et al.

C.1.2.5.2 Specially Designated Areas and Lands with Wilderness Characteristics

None

C.1.2.5.3 Rangeland Resources

Livestock Grazing. None.

Wild Horses and Burros. None.

C.1.2.5.4 Recreation

None.

C.1.2.5.5 Military and Civilian Aviation

The proposed technology restrictions described in Sections C.1.2.3 and C.7.3 are expected to minimize or eliminate any potential issues with the MTR that crosses the SEZ; however, the BLM will continue to consult with the DoD regarding potential issues with the MTR.

C.1.2.5.6 Geologic Setting and Soil Resources

None.

C.1.2.5.7 Minerals

Additional information on leasable and strategic minerals in the vicinity of the proposed SEZ will be provided in the Final Solar PEIS to inform the Department of the Interior's decision on a proposed 20-year withdrawal of SEZ lands.

C.1.2.5.8 Water Resources

The following additional data and actions would help further characterize potential impacts on water resources for the proposed Gillespie SEZ. A more detailed discussion of each of these activities is included in the water resources action plan provided Section C.7.2 of this appendix.

- Prepare a planning-level water resources inventory of the Lower Hassayampa basin.

- Identify additional ephemeral stream channels and alluvial fan features for non-development areas through consultation BLM Arizona, Arizona Game and Fish Department (AZGFD), Arizona Department of Water Resources (ADWR), U.S. Environmental Protection Agency, and U.S. Army Corps of Engineers (USACE) with a focus on:
  - The unnamed wash tributaries to Centennial Wash.

- Perform field surveys and hydrologic analyses to support jurisdictional water determinations and floodplain identifications. Tasks include:
  - Surveying unnamed wash tributaries of Centennial Wash for surface elevations, high water marks, and sediment conditions; and
  - Conducting hydrologic rainfall-runoff-routing analyses to identify 100-year floodplain areas.

- Coordinate with the USACE (Los Angeles District) regarding jurisdictional water determinations for the SEZ. Water features that need to be considered include:
  - The unnamed wash tributaries to Centennial Wash.

- Identify 100-year floodplain non-development areas (if they exist) for unnamed wash tributaries to Centennial Wash. This task would require coordination with the Federal Emergency Management Agency (FEMA) and the following agencies:
  - AZDWR (Flood Mitigation Section), and
  - The Flood Control District of Maricopa County.

- Describe the formation of a stakeholder committee to conduct long-term monitoring of water resources. This activity would entail:
  - Identifying key stakeholder agencies,
  - Discussing general features of a monitoring program, and
  - Working with the U.S. Geological Survey to develop groundwater monitoring well design and numerical groundwater models.

C.1.2.5.9 Ecological Resources

Vegetation and Plant Communities. The following additional data-gathering actions would help further characterize potential impacts on vegetation and plant communities for the proposed Gillespie SEZ:

- Identify and map the location and areal extent of desert dry wash, dry wash woodland, and wetland habitats within the SEZ. Identify and map the location

and areal extent of these habitats, as well as mesquite bosque and riparian habitats, outside the SEZ that may be affected by hydrologic changes, including groundwater elevations, and changes in water, sediment, and contaminant inputs associated with runoff. Such effort could help determine habitat characteristics, including water source, hydrologic regime, and dominant plant species.

- Identify and map the location and areal extent of saguaro cactus communities within the SEZ. Identify and map the locations of all cacti occurring on the SEZ, including saguaro, pencil cholla, barrel cactus, and others.

Wildlife. None.

Aquatic Biota. Investigations recommended under the water resources action plan (Section C.1.2.5.8) would be useful in characterizing and protecting habitat available to aquatic biota. Most washes and wetlands in the SEZ are typically dry and contain water only for brief periods following precipitation. These features may or may not contain aquatic biota; therefore, preliminary evaluations of these surface water features could be conducted to determine the potential for aquatic communities to be present.

Special Status Species. The following additional data-gathering actions would be useful in further characterizing and protecting habitat available to special status species:

- Conduct pre-disturbance surveys within the SEZ to determine the presence and abundance of those special status species that are (1) federally listed, proposed for listing, or candidates for listing under the Endangered Species Act; or (2) designated as sensitive by the Arizona BLM State Office. These species are listed in Table C.1.2-1. Surveys should focus on areas identified as potentially suitable, and the suitability of these habitats to support these special status species should be determined in the field. All field-determined suitable habitats for special status species should be mapped. Target species and survey protocols should be developed in coordination with the U.S. Fish and Wildlife Service (USFWS) and AZGFD.

  The Draft Solar PEIS presents a table of special status species for which potential impacts need to be evaluated prior to development in the proposed Gillespie SEZ. The list of species presented in Table 8.3.12.1-1 of the Draft Solar PEIS also includes species listed by the State of Arizona and species ranked by the State of Arizona as S1 or S2. Based on the design features presented in the Draft Solar PEIS, the potential for impacts on these additional species will also need to be addressed before development could occur in the SEZ.

TABLE C.1.2-1 Special Status Species That May Occur in the Vicinity of the Proposed Gillespie SEZ[a]

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Plants			
Hohokam agave	*Agave murpheyi*	BLM-S	Endemic to Arizona and Sonora, Mexico on benches or alluvial terraces on gentle bajada slopes above major drainages in desert scrub communities. Elevation ranges between 1,300 and 3,200 ft.[d] Nearest recorded quad-level occurrences are approximately 45 mi[e] north of the SEZ. About 50,800 acres[f] of potentially suitable habitat occurs within the SEZ region.
Tumamoc globeberry	*Tumamoca macdougalii*	BLM-S	Endemic to southern Arizona and northern Mexico in xeric situations, in shady areas of nurse plants along gullies and sandy washes at elevations below 3,000 ft. Nearest quad-level occurrence is approximately 35 mi southeast of the SEZ. About 50,800 acres of potentially suitable habitat occurs within the SEZ region.
Fish			
Roundtail chub[g]	***Gila robusta***	BLM-S	Larger tributaries in the Colorado Basin, from Wyoming south to Arizona and New Mexico; cool to warm water streams and rivers consisting of pools adjacent to riffles and runs and with boulders, tree roots, submerged trees and branches, and undercut cliff walls. Historic quad-level occurrence intersects the affected area from the Gila River, within 5 mi east of the SEZ. The species is currently not known to occur in the affected area. About 300 mi of potentially suitable habitat within the Gila and Hassayampa Rivers occurs within the SEZ region.
Amphibians			
Lowland leopard frog	***Lithobates yavapaiensis***	BLM-S	Aquatic systems in desert grasslands, pinyon-juniper woodlands, and agricultural areas, including rivers, streams, beaver ponds, springs, earthen cattle tanks, livestock guzzlers, canals, and irrigation sloughs. Quad-level occurrences intersect the affected area. About 246,500 acres of potentially suitable habitat occurs within the SEZ region.
Reptiles			
Desert tortoise (Sonoran population)	***Gopherus agassizii***	ESA-C; BLM-S	Desert creosotebush communities on firm soils for digging burrows, along riverbanks, washes, canyon bottoms, creosote flats, and desert oases. Quad-level occurrences intersect the affected area. About 3,750,000 acres of potentially suitable habitat occurs within the SEZ region.
Mexican rosy boa	*Charina trivirgata trivirgata*	BLM-S	Sonoran Desert near rocky hillsides and rock outcroppings. Nearest quad-level occurrence is approximately 20 mi southeast of the SEZ. About 3,800,000 acres of potentially suitable habitat occurs within the SEZ region.
Tucson shovel-nosed snake	*Chionactis occipitalis klauberi*	ESA-C	Endemic to Arizona from Pima, Pinal, and Maricopa Counties in creosote-mesquite floodplain habitats with soft sandy loam soils and sparse gravel. Nearest quad-level occurrence is approximately 20 mi southeast of the SEZ. About 1,436,500 acres of potentially suitable habitat occurs within the SEZ region.

TABLE C.1.2-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Birds			
Ferruginous hawk	*Buteo regalis*	BLM-S	Winter resident in the SEZ region. Grasslands, sagebrush and saltbrush habitats, as well as the periphery of pinyon-juniper woodlands. Nests in tall trees or on rock outcrops along cliff faces. Known to occur in Maricopa County, Arizona. About 395,000 acres of potentially suitable foraging habitat occurs within the SEZ region.
Great egret	*Ardea alba*	BLM-S	Year-round resident in the lower Colorado River Valley in open water areas such as marshes, estuaries, lagoons, lakes, ponds, rivers and flooded fields. Nearest quad-level occurrence is from Painted Rock Reservoir, approximately 11 mi (18 km) south of the SEZ. About 28,750 acres of potentially suitable habitat occurs within the SEZ region.
Snowy egret	*Egretta thula*	BLM-S	Year-round resident in the lower Colorado River Valley in open water areas such as marshes, estuaries, lagoons, lakes, ponds, rivers and flooded fields. Nearest quad-level occurrence is from Painted Rock Reservoir, approximately 11 mi (18 km) south of the SEZ. About 675,200 acres of potentially suitable habitat occurs within the SEZ region. The species is expected to occur as a transient only on the SEZ.
Southwestern willow flycatcher	***Empidonax traillii extimus***	ESA-E	Riparian shrublands and woodlands, thickets, scrubby and brushy areas, open second growth, swamps, and open woodlands. Quad-level occurrences intersect the affected area. About 50,000 acres of potentially suitable habitat occurs within the SEZ region.
Western burrowing owl	*Athene cunicularia hypugaea*	BLM-S	Open grasslands and prairies, as well as disturbed sites such as golf courses, cemeteries, and airports throughout the SEZ region. Nests in burrows constructed by mammals (prairie dog, badger, etc.). Nearest quad-level occurrence is approximately 14 mi (22 km) east of the SEZ. About 4,376,000 acres of potentially suitable habitat occurs within the SEZ region.
Western yellow-billed cuckoo	***Coccyzus americanus***	ESA-C	Considered to be a riparian obligate, usually found in large tracts of cottonwood/willow habitats with dense sub-canopies. Quad-level occurrences intersect the affected area. About 50,000 acres of potentially suitable habitat occurs within the SEZ region.
Yuma clapper rail	***Rallus longirostris yumanensis***	ESA-E	Year-round resident in the SEZ region. Freshwater marshes containing dense stands of cattails. Nests on dry hummocks or in small shrubs among dense cattails or bulrushes along the edges of shallow ponds in freshwater marshes with stable water levels. Quad-level occurrences intersect the affected area. About 50,000 acres of potentially suitable habitat occurs within the SEZ region.
Mammals			
California leaf-nosed bat	***Macrotus californicus***	BLM-S	Year-round resident in desert riparian, desert wash, desert scrub, and palm oasis habitats at elevations below 2,000 ft (600 m). Roosts in mines, caves, and buildings. Quad-level occurrences intersect the affected area. About 3,960,000 acres of potentially suitable habitat occurs within the SEZ region.

TABLE C.1.2-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Mammals (Cont.)			
Western red bat	*Lasiurus blossevillii*	BLM-S	Year-round resident in SEZ region. Forages in riparian and other wooded areas. Roosts primarily in cottonwood trees along riparian areas. Nearest recorded quad-level occurrence is from the Hassayampa River, approximately 50 mi north of the SEZ. About 17,400 acres of potentially suitable habitat occurs within the SEZ region.
Western yellow bat	*Lasiurus xanthinus*	BLM-S	Year-round resident in desert riparian, desert wash, and palm oasis habitats at elevations below 2,000 ft. Roosts in trees. Nearest quad-level occurrence is from the vicinity of Phoenix, approximately 40 mi (64 km) northeast of the SEZ. About 4,407,500 acres of potentially suitable habitat occurs within the SEZ region.

[a] The listings for (1) federally listed, proposed for listing, or candidates for listing under the ESA, and (2) Arizona BLM State Office sensitive species have been updated since the release of the Draft Solar PEIS.

[b] BLM-S = listed as a sensitive species by the BLM; ESA-C = candidate for listing under the ESA; ESA-E = listed as endangered under the ESA.

[c] For plant species, potentially suitable habitat was determined by using Southwest Regional Gap Analysis Project (SWReGAP) land cover types (USGS 2005). For terrestrial vertebrate species, potentially suitable habitat was determined by using SWReGAP habitat suitability and land cover models. Area of potentially suitable habitat for each species is presented for the SEZ region, which is defined as the area within 50 mi (80 km) of the SEZ center.

[d] To convert ft to m, multiply by 0.3048.

[e] To convert mi to km, multiply by 1.609.

[f] To convert acres to km^2, multiply by 0.004047.

[g] Species in bold text have been recorded or have designated critical habitat in the affected area.

- Identify and map the areal extent of wetland and riparian habitats within the SEZ, including habitat characteristics (such as water source, hydrologic regime, and dominant plant species) both within the wetland boundaries and in adjacent non-wetland habitats. Species potentially associated with these habitats include the Hohokam agave, Tumamoc globeberry, lowland leopard frog, snowy egret, southwestern willow flycatcher, western yellow-billed cuckoo, Yuma clapper rail, and western yellow bat.

C.1.2.5.10 Air Quality and Climate

None.

C.1.2.5.11 Visual Resources

Visual resources will be re-evaluated for the Final Solar PEIS based on proposed technology restrictions described in Section C.1.2.3 of this Supplement. A summary of the Draft Solar PEIS visual contrast analysis for the proposed Gillespie SEZ is provided in Table C.1.2-2. This table includes only the resources that would be subject to moderate or strong visual contrast. The Draft Solar PEIS visual impact analysis predicted these levels of visual contrast from solar energy development in the Gillespie SEZ for the following sensitive visual resource areas (SVRAs) and sensitive viewing locations (SVLs):

- Signal Mountain WA
- Woolsey Peak WA
- Saddle Mountain SRMA
- Agua Caliente Road
- Salome Highway
- Old U.S. 80
- Arlington.

The following steps could be taken to better understand potential impacts on these SVRAs and SVLs from solar development in the Gillespie SEZ:

- Identify key observation points (KOPs) within these areas through working with the management agency or other local stakeholders.
- Conduct viewshed analyses from the KOPs to determine how much of the SEZ would be in view from each KOP.
- As deemed necessary, based on viewshed analysis results, prepare wireframe Google Earth™ visualizations of hypothetical solar facilities in the SEZ depicting the 80% development scenario to better estimate potential impacts.

This additional analysis may help judge potential visual contrast more accurately for most KOPs. For KOPs of particularly high sensitivity, a site visit with photography and superimposition of the wireframe models onto the photos might be required or desired.

Additional required mitigation measures to address potential visual resource impacts are given in Section C.7.3 of this appendix.

TABLE C.1.2-2 Summary of Potential Visual Impacts on SVRAs and SVLs within the 25-mi (40-km) Viewshed of the Proposed Gillespie SEZ

Management Area Category	SVRA/SVL within 25 mi[a] of SEZ	Total Acreage/ Mileage[a,b,c] of SVRA/SVL	Distance from SEZ at Point of Closest Approach[d]	Total Acreage/ Mileage Visible within 25 mi[e]	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes[f]
WAs	Signal Mountain	13,467 acres	3.5 mi southwest of the SEZ	2,514 acres	18.7	Portions of the WA are within a relatively short distance of the SEZ, and regardless of the elevation of the viewpoints, where open views of the SEZ existed, viewers in these areas could be subjected to strong visual contrasts from solar facilities; in other portions of the WA, topographic screening of portions of the SEZ and lower height facilities would tend to reduce visual contrast levels, as would decreased elevation of viewpoints and increased distance from the SEZ: Visible area of the WA extends about 6.5 mi from the southwestern boundary of the SEZ
	Woolsey Peak	64,465 acres	2.1 mi south of the SEZ	11,389 acres	17.7	WA is sufficiently close to the SEZ that for many viewpoints, and particularly for elevated viewpoints in the northern portion, solar energy development would be expected to result in strong visual contrast levels; lower contrast levels would be expected for lower elevation viewpoints, and for higher elevation viewpoints deeper in the interior of the WA: visible area of the WA extends about 12.5 mi from the southern boundary of the SEZ.

TABLE C.1.2-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi[a] of SEZ	Total Acreage/ Mileage[a,b,c] of SVRA/SVL	Distance from SEZ at Point of Closest Approach[d]	Total Acreage/ Mileage Visible within 25 mi[e]	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes[f]
SRMA	Saddle Mountain	47,696 acres	4.3 mi northwest of the SEZ	27,237 acres	57.1	SRMA is sufficiently close to the SEZ that for some viewpoints within the SRMA, solar energy development within the SEZ would be expected to result in moderate to strong visual contrast levels; lower contrast levels would be expected for lower elevation viewpoints, and for higher elevation viewpoints in the northwestern portion, farther from the SEZ. Visible area extends from the point of closest approach to 12 mi within the SRMA; development likely would be visible from low elevation areas in the southeast of the SRMA, and from the south and east facing slopes of the Saddle Mountain and the Palo Verde Hills
Other Areas of Interest (non-management areas)	Agua Caliente Road (Agua Caliente Scenic Drive)	49 mi	1.6 mi from the southeastern boundary of the SEZ	2.2 mi	4.5	Visual contrast levels arising from solar facilities would vary depending on viewer location and the type, size, location, and layout of solar facilities; weak to strong levels of visual contrast would be expected for travelers, primarily because the road crosses the SEZ several times and otherwise passes very near the SEZ. Proposed BLM Backcountry Byway

TABLE C.1.2-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi[a] of SEZ	Total Acreage/ Mileage[a,b,c] of SVRA/SVL	Distance from SEZ at Point of Closest Approach[d]	Total Acreage/ Mileage Visible within 25 mi[e]	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes[f]
Other Areas of Interest (non-management areas) (*Cont.*)	Salome Highway	NA[g]	9 to 10 mi northeast of the SEZ	11	NA	Moderate levels of visual contrast would be expected for most viewpoints on the Salome Highway: Portions in viewshed of SEZ are about 9-10 mi northeast of SEZ
	Old U.S. 80[h]	1,032 mi	2 mi northeast of the southeast corner of the SEZ	29 mi	2.8	Strong levels of visual contrast would be expected to result from solar energy development: viewpoints along Old U.S. 80 are generally slightly lower in elevation than the SEZ, particularly in the southern sections of the road within the SEZ viewshed
	Arlington	NA	7 mi northeast of the SEZ	NA	NA	Strong levels of visual contrast would be expected, as seen from unscreened viewpoints within Arlington: Located approximately 7 mi from northeast of SEZ; A detailed future site-specific NEPA analysis is required to determine visibility precisely

[a] To convert mi to km, multiply by 1.609.

[b] To convert acres to km^2, multiply by 0.004047.

[c] Mileage (within all columns) is used only for trails or roads, unless otherwise specified.

Footnotes continued on next page.

TABLE C.1.2-2 (Cont.)

[d] Distances at the point of closest approach are based on the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries would result in changes to these calculations.

[e] The total acreage/mileage visible within 25 mi (40 km) of the SEZ is based on the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries would result in changes to these acreages/mileages, as well as the percent total acreages/mileages visible within 25 mi (40 km) of the SEZ.

[f] The assessment of impacts is based the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries may result in reduced impacts in some of the SVRAs/SVLs due to the reduction in the overall footprint of the SEZ.

[g] NA = data not available.

[h] Length of U.S. 80: US-Highways.com (2007).

C.1.2.5.12 Acoustic Environment

None.

C.1.2.5.13 Paleontological Resources

The BLM Regional Paleontologist will be contacted to determine whether additional information is available regarding Potential Fossil Yield Classification (PFYC) identifications in Arizona. A preliminary paleontological survey could be conducted to determine the PFYC of the SEZ, in order to update the temporary assignment of PFYC Class 3b used in the Draft Solar PEIS.

C.1.2.5.14 Cultural Resources and Native American Concerns

A very small percentage of the proposed Gillespie SEZ has been surveyed for cultural resources, so, absent specific information, impacts are unknown but possible. Five small surveys had been conducted within the SEZ, but no sites were recorded. A spur of the Southern Pacific Railroad, the second transcontinental railroad in the United States, is located 1 mi (1.6 km) north of the SEZ, and the Craig Railroad Station, listed in the *National Register of Historic Places*, is located within 5 mi (8 km). Gillespie Dam Highway Bridge is also listed on the *National Register of Historic Places* and is located within 3 mi of the SEZ. The Juan Batista de Anza National Historic Trail is approximately 17 mi (27 km) south of the SEZ, but intervening topography would preclude most visibility of the SEZ—only a 4-mi (6.4 km) stretch of the trail would be within a 25-mi (40-km) viewshed and visual impacts were assessed as minimal.

Prehistoric sites are likely and historic sites related to the railroad and ranching/homesteading are also possible within the SEZ. The eastern portion of the SEZ, closest to the Gila River, has the most potential for containing sensitive prehistoric archaeological sites. The newly proposed Gila River Terraces Area of Critical Environmental Concern (ACEC) is a corridor containing significant resources that runs along the Gila River.[5] These resources may extend into the Gillespie SEZ.

The northern area of the SEZ has the highest potential for historic sites associated with the railroad. Potential impacts could also include visual and auditory impacts on sacred sites and traditional use areas along the Gila River corridor and within the Gila Bend Mountains. Drawdown of groundwater and water rights issues may be of potential concern for the Tohono O'odham Reservation that is located 16 mi (26 km) south of the SEZ. The destruction or degradation of important plant resources and the destruction of habitat or impediments to the movement of culturally important wildlife are also potential impacts of concern within the SEZ.

The following additional data collection efforts could reduce the uncertainty about potential impacts on cultural resources:

[5] Information on the proposed Gila River Terraces ACEC is new and was not presented in the Draft Solar PEIS.

- Conduct a Class I literature file search to better understand (1) the site distribution pattern in the vicinity of the SEZ; (2) potential trail networks; and (3) overall cultural sensitivity of the landscape. A Class I review can determine the actual percentage of survey coverage already conducted within the SEZ.

- Conduct a Class II Stratified Random Sample Survey of the proposed SEZ to obtain a 10% sample (roughly 262 acres [1.1 km^2] or less).[6] Areas of interest, as determined through a Class I review, should also be identified prior to establishing the survey design and sampling strategy.

- Prepare a cultural sensitivity map based on results of the Class II survey and Class I review.

- Continue with government-to-government consultation as described in Section 2.4.3, including follow-up to recent ethnographic studies with Tribes not included in the original studies to determine whether those Tribes have similar concerns. The Gillespie SEZ falls in the traditional use area of primarily the Maricopa, Akimel O'odham (Pima), and Tohono O'odham (Papago). Potential topics to be discussed during consultation include: water rights, the Gila River corridor, sacred mountains in the area, local Hohokam sites, and plant and animal resources.

C.1.2.5.15 Socioeconomics and Environmental Justice

None.

C.1.2.5.16 Cumulative Impact Considerations

None.

[6] The BLM plans to conduct a Class II survey of 5% of this SEZ prior to the Final Solar PEIS. Additional areas could be surveyed as funding becomes available.

C.2 CALIFORNIA PROPOSED SOLAR ENERGY ZONES

C.2.1 Imperial East

C.2.1.1 Summary of Potential Impacts Identified in the Draft Solar Programmatic Environmental Impact Statement (PEIS)

The proposed Imperial East solar energy zone (SEZ), as presented in the Draft Solar PEIS, had a total area of 5,722 acres (23.2 km^2). It is located in Imperial County in southeastern California, near the United States–Mexico border (Figure C.2.1-1). The nearest town is the community of Holtville, located approximately 10 mi (16 km) northwest of the SEZ.

A designated Section 368 energy corridor covers about 80% of the SEZ, potentially leaving less than 1,000 acres (4 km^2) available for solar development.[7] This corridor could limit development in the SEZ because solar facilities cannot be constructed under transmission lines. The discussion of impacts of solar energy development in the SEZ in the Draft Solar PEIS acknowledged that the presence of the corridor would reduce the amount of land available for solar power production, and, conversely, that full development of solar facilities within the SEZ would limit use of the transmission corridor.

The location of new transmission that could be constructed for this SEZ in the future may be different from that assumed in the Draft Solar PEIS. Details on the revised transmission impact assessment to be included in the Final Solar PEIS are provided in Section C.7.1 of this appendix. Analysis of transmission lines and/or access roads will be completed, as necessary, as part of the project-specific environmental reviews (see Section 2.2.2.2.2 of this Supplement).

Potential adverse impacts identified in the Draft Solar PEIS included the following:

- Impacts on two nearby Areas of Critical Environmental Concern (ACECs) with prehistoric resources (Lake Cahuilla C and D) could occur due to increased human traffic.

- Development could encroach into military training routes (MTRs) and special use airspace (SUA), thereby creating safety issues and conflicting with military training. Also, power towers could pose some hazard to operation of the Mexicali Airport.

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7 Section 368 of the Energy Policy Act of 2005 (Public Law 109-58) required federal agencies to engage in transmission corridor planning (see Section 1.6.2.1 of the Draft Solar PEIS). As a result of this mandate, the U.S. Department of the Interior Bureau of Land Management (BLM), U.S. Department of Energy (DOE), U.S. Forest Service (USFS), and U.S. Department of Defense (DoD) prepared a PEIS to evaluate the designation of energy corridors on federal lands in 11 western states, including the 6 states evaluated in this study (DOE and DOI 2008). The BLM and USFS issued Records of Decision to amend their respective land use plans to designate numerous corridors, often referred to as Section 368 corridors.

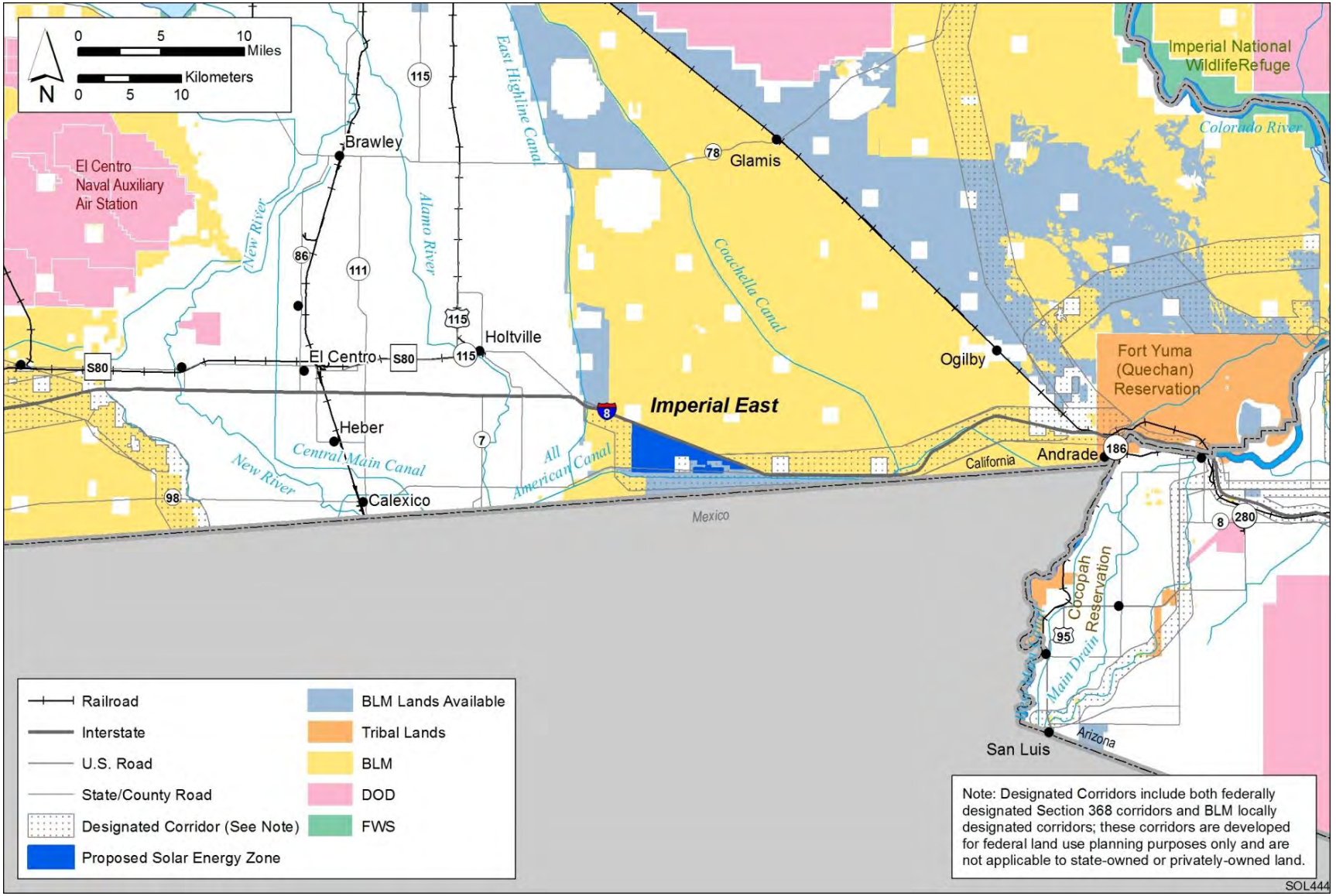

FIGURE C.2.1-1 Proposed Imperial East SEZ as Presented in the Draft Solar PEIS

- Impacts on soil resources (e.g., soil compaction, soil horizon mixing, soil erosion and deposition by wind and runoff, sedimentation, and soil contamination) could occur.

- About 60% of the SEZ is included within a known geothermal resource area (KGRA); solar development would prevent geothermal resource development.

- Groundwater use would deplete the aquifer to the extent that, at a minimum, wet-cooling options would not be feasible.

- Runoff of water and sediments from the proposed SEZ could adversely affect the existing wetlands and mitigation wetlands.

- Clearing of a large portion of the proposed SEZ could adversely affect wetlands, riparian habitats, desert dry washes, and sand dune habitats, depending on the amount of available habitat disturbed. The establishment of noxious weeds could result in habitat degradation. Deposition of fugitive dust could cause reduced productivity or changes in plant community structure.

- Potentially suitable habitat for 35 special status species and 160 wildlife species occurs in the affected area of the proposed SEZ; less than 1% of the potentially suitable habitat for any of these species occurs in the region that would be directly affected by development.

- Temporary exceedances of ambient air quality standards for particulate matter at the SEZ boundaries are possible during construction. These high concentrations, however, would be limited to the immediate area surrounding the SEZ boundary.

- Generally, there would be minimal visual impacts on communities and highly sensitive visual resource areas; however, portions of the Juan Baptista de Anza Historic Trail auto route lie within the SEZ and the viewshed. Two major roads are also within the SEZ viewshed. Strong visual contrasts could be observed by travelers on these routes.

- Noise levels at the nearest residences could be higher during construction than the U.S. Environmental Protection Agency guideline levels. During operations, it was estimated that noise levels at the nearest residences would exceed county regulation levels if concentrating solar power facilities with energy storage technologies (which could extend the daily operational time by 6 hours or more) were used at the SEZ.

- The potential for impacts on significant paleontological and cultural resources is unknown. It is possible that there will be Native American concerns about the potential for burials within or near the SEZ and visual impacts on landscape features.

- Minority populations occur within a 50-mi (80-km) radius of the proposed SEZ boundary; thus adverse impacts of solar development could disproportionately affect minority populations.

- Users of California State Route 98 could experience moderate traffic congestion during construction at the SEZ.

C.2.1.2 Summary of Comments Received

Most of the comments received on the proposed Imperial East SEZ were in favor of identifying the area as an SEZ in the applicable land use plan, but with reduction in size to eliminate conflicts (California Public Utilities Commission, California Desert Coalition, Natural Resources Defense Council [NRDC] et al.,[8] and Center for Biological Diversity). The California Energy Commission and Department of Fish and Game (CDFG) were in favor of expanding the SEZ, assuming Areas of Rare Species Richness could be avoided (these are being evaluated in the Desert Renewable Energy Conservation Plan [DRECP]). However, the Quechan Tribe, Western Watersheds Project, and California State Parks recommended eliminating the SEZ because of cultural, wildlife, and special status species concerns.

With respect to cumulative impacts, the NRDC requested that information from other solar energy EISs in the vicinity of this SEZ be considered in the Final Solar PEIS. In addition, a member of a wildlife organization noted the absence of a means for prioritizing competing renewable energy interests in a given area, noting that a KGRA underlies the SEZ.

Several comments from the solar industry requested additional analysis of transmission capacity and details on when, where, and how transmission would be developed.

C.2.1.3 Changes to the SEZ

No boundary revisions were identified for the proposed SEZ. However, areas specified for non-development under SEZ-specific design features were mapped, where data were available. For the proposed Imperial East SEZ, 5 acres (0.02 km^2) of wetlands along the southern border of the SEZ were identified as non-development areas (see Figure C.2.1-2). The remaining developable area within the SEZ is 5,717 acres (23.1 km^2).

[8] The Natural Resources Defense Council, Audubon Society, California Native Plant Society, California Wilderness Coalition, Californians for Western Wilderness, Defenders of Wildlife, the National Parks Conservation Association, Point Reyes Bird Observatory Conservation Science, Sierra Club, The Wilderness Society, and The Wildlands Conservancy submitted joint comments on the proposed California SEZs. Those comments are attributed to The Natural Resources Defense Council et al.

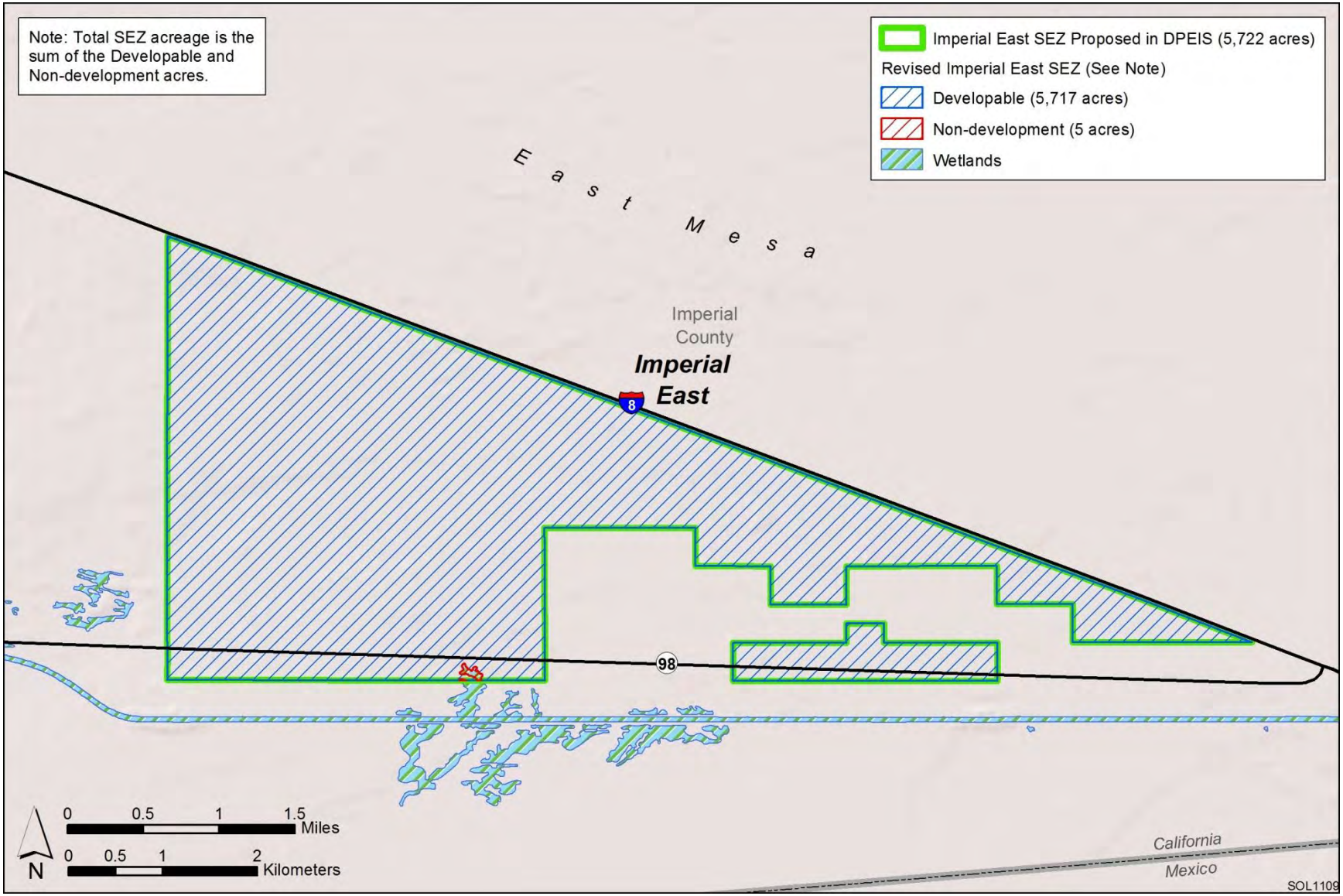

FIGURE C.2.1-2 Proposed Imperial East SEZ as Described in this Supplement

C.2.1.4 Wilderness Character Status of SEZ

A recently maintained inventory of wilderness characteristics was used to determine whether public lands within the Imperial East SEZ have wilderness characteristics. The finding of this inventory was that these lands do not contain wilderness characteristics.

C.2.1.5 Additional Data Collection Recommended

C.2.1.5.1 Lands and Realty

None.

C.2.1.5.2 Specially Designated Areas and Lands with Wilderness Characteristics

None.

C.2.1.5.3 Rangeland Resources

Livestock Grazing. None.

Wild Horses and Burros. None.

C.2.1.5.4 Recreation

None.

C.2.1.5.5 Military and Civilian Aviation

The BLM will continue to consult with the DoD regarding potential issues with MTRs and SUA. The potential impact of power towers in this SEZ, including the ability of power towers to comply with Federal Aviation Administration regulations pertaining to air navigation obstructions, could be further investigated.

C.2.1.5.6 Geologic Setting and Soil Resources

None.

C.2.1.5.7 Minerals

Sixty percent of the SEZ is within a KGRA. The compatibility of solar and geothermal development could be further investigated.

Additional information on leasable and strategic minerals in the vicinity of the proposed SEZ will be provided in the Final Solar PEIS to inform the Department of the Interior's decision on a proposed 20-year withdrawal of SEZ lands.

C.2.1.5.8 Water Resources

The following additional data and actions would help further characterize potential impacts on water resources for the proposed Imperial East SEZ. A more detailed discussion of each of these activities is included in the water resources action plan provided in Section C.7.2 of this appendix.

- Prepare a planning-level water resources inventory of the Imperial Valley Basin.

- Verify the mitigation wetland enhancement project for jurisdictional water determinations with the U.S. Army Corps of Engineers (USACE) (Los Angeles District) and the Imperial Irrigation District (IID). It is likely these were considered jurisdictional waters during the IID's restoration efforts. If no jurisdictional water determination has been made for the wetlands along the southern border of SEZ, then:
  - A field survey should be conducted, and
  - A jurisdictional water determination should be obtained from the USACE (Los Angeles District).

- Describe the formation of a stakeholder committee to conduct long-term monitoring of water resources. This activity would entail:
  - Identifying key stakeholder agencies,
  - Discussing general features of a monitoring program, and
  - Working with the U.S. Geological Survey to develop groundwater monitoring well design and numerical groundwater models.

- Develop a simple, numerical groundwater model for the southern portion of Imperial Valley. This activity would entail:
  - Assessing the potential for drawdown impacts on the restored, mitigation wetlands located along the All-American Canal, and
  - Coordinating with the IID to identify any potential groundwater drawdown concerns regarding its operations (e.g., All-American Canal, East Highland Canal, other drainage ditches) to be evaluated in the numerical groundwater model.

C.2.1.5.9 Ecological Resources

Vegetation and Plant Communities. The following additional data-gathering actions would help further characterize potential impacts on vegetation and plant communities for the proposed Imperial East SEZ.

- Identify and map the location and areal extent of desert riparian, wash, and wetland habitats within the SEZ. Identify and map the location and areal extent of desert riparian, wash, and wetland habitats outside the SEZ that may be affected by hydrologic changes, including groundwater elevations, and changes in water, sediment, and contaminant inputs associated with runoff. Such effort could determine the habitat characteristics (including water source, hydrologic regime, and dominant plant species) both within the wetland boundaries and in adjacent non-wetland habitats.

- Identify and map the location and areal extent of sand dunes and sand transport systems within the SEZ.

Wildlife. The following additional data-gathering actions would help further characterize potential impacts on wildlife resources for the SEZ:

- Conduct pre-disturbance surveys within the SEZ to determine the use of the SEZ as a movement/migratory corridor for desert bighorn sheep.

- Identify and map the location and areal extent of desert riparian wash, wetland, and sand dune and sand transport habitats within the SEZ. These areas are important habitat areas for many game and nongame species of wildlife.

Aquatic Biota. Wetlands are present, and, therefore, direct impacts on wetland communities are possible as a result of solar energy development within the SEZ. These areas could be surveyed for aquatic communities. Additionally, the man-made All-American Canal and East Highline Canal and associated palustrine wetlands within 5 mi (8 km) of the SEZ could be indirectly affected by development and operation of solar energy facilities. However, the All-American Canal and associated wetlands have primarily non-native fish, and no protected aquatic biota are known to be present. Thus, impacts on aquatic biota would likely be to invasive or common species. New surveys could be conducted to confirm this, but the primary value of these features is for nonaquatic animals that may consume aquatic biota within the SEZ. Therefore, no surveys are recommended.

Special Status Species. The following additional data-gathering actions would be useful in further characterizing and protecting habitat available to special status species:

- Conduct pre-disturbance surveys within the SEZ to determine the presence and abundance of those special status species that are (1) federally listed, proposed for listing, or candidates for listing under the Endangered Species Act (ESA); (2) listed by the State of California as endangered, threatened, or fully protected; or (3) designated as sensitive by the California BLM State Office. These species are listed in Table C.2.1-1. Surveys should focus on areas identified as potentially suitable, and the suitability of these habitats to support these special status species should be determined in the field. All field-determined suitable habitats for special status species should be mapped. Target species and survey protocols should be developed in coordination with the U.S. Fish and Wildlife Service and CDFG.

  The Draft Solar PEIS presents a table of special status species for which potential impacts need to be evaluated prior to development in the proposed Imperial East SEZ. The list of species presented in Table 9.1.12.1-1 of the Draft Solar PEIS also includes species listed by the State of California and species ranked by the State of California as S1 or S2. Based on the design features presented in the Draft Solar PEIS, the potential for impacts on these additional species will also need to be addressed before development could occur in the SEZ.

- Identify and map the location and areal extent of desert riparian, wash, and wetland habitats within the SEZ, including habitat characteristics (such as water source, hydrologic regime, and dominant plant species) both within the wetland boundaries and in adjacent non-wetland habitats. Species potentially associated with these habitats include Munz's cholla, Colorado Desert fringe-toed lizard, California black rail, ferruginous, least bittern, Yuma clapper rail, California leaf-nosed bat, pallid bat, Townsend's big-eared bat, and western mastiff bat.

- Identify and map the location and areal extent of sand dunes and sand transport systems on the SEZ. Species potentially associated with these habitats include chaparral sand-verbena, flat-seeded spurge, giant Spanish-needle, sand food, Colorado Desert fringe-toed lizard, and flat-tailed horned lizard.

C.2.1.5.10 Air Quality and Climate

None.

TABLE C.2.1-1 Special Status Species That May Occur near the Proposed Imperial East SEZ[a]

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Plants			
Chaparral sand-verbena	*Abronia villosa* var. *aurita*	BLM-S	Endemic to southern California. Chaparral desert sand dunes at elevations between 350 and 5,250 ft.[d] Historically occurred on and in the vicinity of the SEZ; the species has not been recorded in the project area since 1964. Most recent recorded occurrences are 15 mi[e] west of the SEZ. About 190,582 acres[f] of potentially suitable habitat occurs within the SEZ region.
Flat-seeded spurge	*Chamaesyce platysperma*	BLM-S	Sandy substrates of desert dunes within Sonoran desertscrub communities at elevations below 650 ft. Nearest recorded occurrences are 45 mi from the SEZ. About 1,249,216 acres of potentially suitable habitat occurs within the SEZ region.
Giant Spanish-needle[g]	***Palafoxia arida* var. *gigantea***	BLM-S	Desert sand dune habitats at elevations below 330 ft. Known to occur in the affected area within 5 mi east of the SEZ. About 190,187 acres of potentially suitable habitat occurs within the SEZ region.
Munz's cholla	*Opuntia munzii*	BLM-S	Gravelly or sandy to rocky soils, often on lower bajadas, washes, and flats. Also occurs in hills and canyon sides. Occurs in Sonoran Desert creosotebush shrub communities at elevations below 3,280 ft. Nearest recorded occurrences are 25 mi north (upgradient) of the SEZ. About 1,856,676 acres of potentially suitable habitat occurs within the SEZ region.
Sand food	***Pholisma sonorae***	BLM-S	Sonoran sand dune habitats at elevations below 650 ft. Known to occur in the affected area within 5 mi east of the SEZ. About 190,187 acres of potentially suitable habitat occurs within the SEZ region.
Reptiles			
Colorado Desert fringe-toed lizard	*Uma notata*	BLM-S	Sparsely vegetated arid areas with windblown sand, including dunes, flats, and washes at elevations below 1,600 ft. Nearest recorded occurrence is 6 mi northeast of the SEZ. About 658,770 acres of potentially suitable habitat occurs within the SEZ region.
Flat-tailed horned lizard	***Phrynosoma mcallii***	BLM-S	Sandy desert hardpan, gravel flats, and dunes with sparse vegetation of low species diversity at elevations below 850 ft. Known to occur in the affected area within 3 mi north of the SEZ. About 281,300 acres of potentially suitable habitat occurs within the SEZ region.

TABLE C.2.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Birds			
California black rail	***Laterallus jamaicensis coturniculus***	BLM-S; CA-FP; CA-T	Year-round resident in the Imperial Valley and lower Colorado River in Arizona and California. Locally common in marshes along the Colorado River or canal systems. Known to occur in the affected area from the All-American Canal. About 184,792 acres of potentially suitable habitat occurs within the SEZ region.
Ferruginous hawk	*Buteo regalis*	BLM-S	Winter resident and migrant at lower elevations and open grasslands, shrublands, and agricultural areas in southern California. Open grasslands, sagebrush flats, desertscrub, desert valleys, and fringes of pinyon-juniper habitats. This species is known to occur in Imperial County, California. About 1,252,826 acres of potentially suitable habitat occurs within the SEZ region.
Least bittern	*Ixobrychus exilis*	BLM-S	Year-round resident in the lower Colorado River Valley, including the Salton Sea and the Colorado River in California and Arizona. Emergent vegetation of larger bodies of water such as lakes, ponds, and rivers. Nests in dense cattail marshes and thickets of saltcedar. The species occurs near the Colorado River as near as 35 mi and 40 mi east and northwest of the SEZ, respectively. About 206,149 acres of potentially suitable habitat occurs within the SEZ region.
Western burrowing owl	*Athene cunicularia hypugaea*	BLM-S	Year-round resident within the SEZ region. Open areas with short sparse vegetation, including grasslands, agricultural fields, and disturbed areas. Nests in burrows created by mammals or tortoises. Feeds on insects and small mammals. Nearest recorded occurrence is 10 mi west of the SEZ. About 2,531,363 acres of potentially suitable habitat occurs within the SEZ region.
Yuma clapper rail	***Rallus longirostris yumanensis***	ESA-E; CA-FP; CA-T	Freshwater marshes containing dense stands of cattails. Nests on dry hummocks or in small shrubs among dense cattails or bulrushes along the edges of shallow ponds in freshwater marshes with stable water levels. Known to occur in the affected area along the All-American Canal within 0.5 mi south of the SEZ. About 185,175 acres of potentially suitable habitat occurs within the SEZ region.
Mammals			
California leaf-nosed bat	*Macrotus californicus*	BLM-S	Year-round resident in SEZ region. Desert riparian, desert wash, desertscrub, and palm oasis habitats at elevations below 2,000 ft. Roosts in mines, caves, and buildings. Nearest recorded occurrences are 20 mi east of the SEZ. About 1,539,377 acres of potentially suitable habitat occurs within the SEZ region.

TABLE C.2.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Mammals (Cont.)			
Pallid bat	*Antrozous pallidus*	BLM-S	Year-round resident throughout the California solar region. Inhabits low-elevation desert communities, including grasslands, shrublands, and woodlands. Day roosts in caves, crevices, and mines. Nearest recorded occurrence is from the North Algodones Dunes Wilderness, approximately 18 mi north of the SEZ. About 1,403,590 acres of potentially suitable habitat occurs within the SEZ region.
Townsend's big-eared bat	*Corynorhinus townsendii*	BLM-S	Found throughout California, in all but subalpine and alpine habitats, and may be found at any season throughout its range. Roosts in caves, mines, tunnels, buildings, or other man-made structures. Nearest recorded occurrence is approximately 35 mi from the SEZ. About 2,919,158 acres of potentially suitable habitat occurs within the SEZ region.
Western mastiff bat	*Eumops perotis californicus*	BLM-S	Year-round resident in southern California and southwestern Arizona in many open semiarid habitats, including conifer and deciduous woodlands, shrublands, grasslands, chaparral, and urban areas. Day roosts in crevices in cliff faces, buildings, and tall trees. Nearest recorded occurrence is 16 mi west of the SEZ. About 2,435,906 acres of potentially suitable habitat occurs within the SEZ region.

[a] The listings for (1) federally listed, proposed for listing, or candidates for listing under the ESA, and (2) California BLM State Office sensitive species have been updated since the release of the Draft Solar PEIS.

[b] BLM-S = listed as a sensitive species by the BLM; CA-FP = listed as fully protected by the State of California; CA-T = listed as threatened by the State of California; ESA-E = listed as endangered under the ESA

[c] For plant and invertebrate species, potentially suitable habitat was determined by using California Regional Gap Analysis Project (CAReGAP) and Southwest Regional Gap Analysis Project (SWReGAP) land cover types (USGS 2005, 2010). For reptile, bird, and mammal species, potentially suitable habitat was determined by using CAReGAP and SWReGAP habitat suitability models as well as CAReGAP and SWReGAP land cover models. Area of potentially suitable habitat for each species is presented for the SEZ region, which is defined as the area within 50 mi (80 km) of the SEZ center.

[d] To convert ft to m, multiply by 0.3048.

[e] To convert mi to km, multiply by 1.609.

[f] To convert acres to km^2, multiply by 0.004047.

[g] Species in bold text have been recorded or have designated critical habitat in the affected area.

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C.2.1.5.11 Visual Resources

A summary of the Draft Solar PEIS visual contrast analysis for the proposed Imperial East SEZ is provided in Table C.2.1-2. This table includes only those resources that would be subject to moderate or strong visual contrast. The Draft Solar PEIS visual impact analysis predicted these levels of visual contrast from solar energy development in the Imperial East SEZ for the following sensitive visual resource areas (SVRAs) and sensitive viewing locations (SVLs):

- Juan Batista de Anza National Historic Trail
- Interstate 8 (I-8)
- State Route 98.

The following steps could be taken to better understand potential impacts on these SVRAs and SVLs from solar development in the Imperial East SEZ:

- Identify key observation points (KOPs) within these areas through working with the management agency or other local stakeholders.
- Conduct viewshed analyses from the KOPs to determine how much of the SEZ would be in view from each KOP.
- As deemed necessary, based on viewshed analysis results, prepare wireframe Google Earth™ visualizations of hypothetical solar facilities in the SEZ depicting the 80% development scenario to better estimate potential impacts.

This additional analysis may help judge potential visual contrast more accurately for most KOPs. For KOPs of particularly high sensitivity (e.g., the historic trail), a site visit with photography and superimposition of the wireframe models onto the photos might be required or desired.

C.2.1.5.12 Acoustic Environment

None.

C.2.1.5.13 Paleontological Resources

The BLM Regional Paleontologist will be contacted to determine whether additional information is available regarding Potential Fossil Yield Classification (PFYC) identifications in California. A preliminary paleontological survey could be conducted to determine the PFYC of the SEZ, in order to update the temporary assignment of PFYC Class 3b used in the Draft Solar PEIS. In addition, the San Bernardino County Museum paleontologist could be contacted to

TABLE C.2.1-2 Summary of Potential Visual Impacts on SVRAs and SVLs within the 25-mi (40-km) Viewshed of the Proposed Imperial East SEZ

Management Area Category	SVRA/SVL within 25 mi[a] of SEZ	Total Acreage/ Mileage[a,b] of SVRA/SVL	Distance from SEZ at Point of Closest Approach[c]	Total Acreage/ Mileage Visible within 25 mi	Percentage of Total Acreage/ Mileage Visible within 25 mi	Notes
National Historic Trail	Juan Batista de Anza	1,210 mi	10 mi south of the SEZ	4 mi	0.3	Strong visual contrasts observed within and near the SEZ would be anticipated for travelers on the auto tour route. Minimal visual contrast would be experienced by nonmotorized trail users.
Other Areas of Interest (non-management areas)	I-8 and State Route 98	NA[d]	Passes through the southern portion of the SEZ	NA	NA	Strong visual contrasts could be observed within and near the SEZ by travelers on I-8 and State Route 98.

[a] To convert mi to km, multiply by 1.609.

[b] To convert acres to km^2, multiply by 0.004047.

[c] Distances are based on the Draft Solar PEIS analysis dated December 2010; any alterations to the SEZ boundaries may result in changes to the distance at the point of closest approach.

[d] NA = data not available.

obtain more detailed information about the potential paleontological resources that may occur in the vicinity of the SEZ.

C.2.1.5.14 Cultural Resources and Native American Concerns

Very little area within the proposed Imperial East SEZ has been surveyed for cultural resources (only about 300 acres [1.2 km^2] in the northwest corner); thus, absent specific information, impacts are unknown but possible on archaeological sites. Two sites are recorded in the SEZ, and two burial sites are recorded with the Native American Heritage Commission in Township/Range sections partially included within or near the SEZ. More than 50 sites were recorded south of the SEZ during the All-American Canal survey.

The SEZ is in the midst of a sacred landscape traversed by a network of trails. The Yuma-San Diego Trail is either close to or goes through the SEZ. This trail links two sacred areas: Pilot Knob (to the east) and Yuha Mesa (to the west). Other related sacred areas with possible viewsheds encompassing the SEZ include the western branch of the Xam Kwatcan Trail at Indian Pass, Gold Basin and Rand Intaglios, and Picacho Peak—all within approximately 35 mi (56.3 km) of the SEZ, to the northeast. Potential impacts could include visual and auditory impacts on sacred sites and possible destruction of segments of the trails system and associated sites.

The destruction or degradation of important plant resources and the destruction of habitat or impediments to the movement of culturally important wildlife are also potential impacts of concern within the SEZ.

The following additional data collection efforts could reduce the uncertainty about potential impacts on cultural resources:

- Conduct a Class I literature file search to better understand (1) the site distribution pattern in the vicinity of the SEZ, (2) the trail networks through existing ethnographic reports, and (3) overall cultural sensitivity of the landscape. (SWCA Environmental Consultants is currently conducting a Class I study of all California SEZs on behalf of the BLM.

- Conduct a Class II Stratified Random Sample Survey of the SEZ to obtain a 10% sample (roughly 572 acres [2.3 km^2]).[9] If the roughly 300 acres (1.2 km^2) previously surveyed meets current survey standards, then approximately 272 additional acres (1.1 km^2) of survey could satisfy a 10% sample. However, all approximately 300 acres (1.2 km^2) are clustered in one area of the SEZ, and additional areas should be considered to provide a more representative sample of the SEZ. Areas of interest as determined through the

[9] The BLM plans to conduct a Class II survey of 5% of this SEZ prior to the Final Solar PEIS. Additional areas could be surveyed as funding becomes available.

Class I review should also be identified when defining the sampling strategy. If appropriate, some subsurface testing of dune areas should be considered in the sampling strategy as well.

- Prepare a cultural sensitivity map based on results of Class I and Class II studies (and incorporation of the results of the DRECP cultural sensitivity map, if applicable for this SEZ).

- Continue with government-to-government consultation as described in Section 2.4.3, including follow-up to recent ethnographic studies with Tribes not included in the original studies to determine whether those Tribes have similar concerns. The Imperial East SEZ falls in the traditional use area of primarily the Quechan, Cocopah, and Cahuilla. Potential topics to be discussed during consultation include two known burials identified in the NAHC database, Indian Pass, Xam Kwatcan Trail, Pilot Knob, Picacho Peak, Yuha Basin, Yuma-San Diego Trail, Lake Cahuilla ACEC Areas C and D, and plant and animal resources.

C.2.1.5.15 Socioeconomics and Environmental Justice

None.

C.2.1.5.16 Cumulative Impact Considerations

None.

C.2.2 Riverside East

C.2.2.1 Summary of Potential Impacts Identified in the Draft Solar Programmatic Environmental Impact Statement (PEIS)

The proposed Riverside East solar energy zone (SEZ), as presented in the Draft Solar PEIS, had a total area of 202,896 acres (821 km^2). It is located in Riverside County in southeastern California (Figure C.2.2-1). The small town of Desert Center is located at the far southwestern edge of the SEZ, along Interstate 10 (I-10).The towns of Blythe and Indio are about 6 mi (10 km) southeast of and 45 mi (72 km) west of the SEZ, respectively.

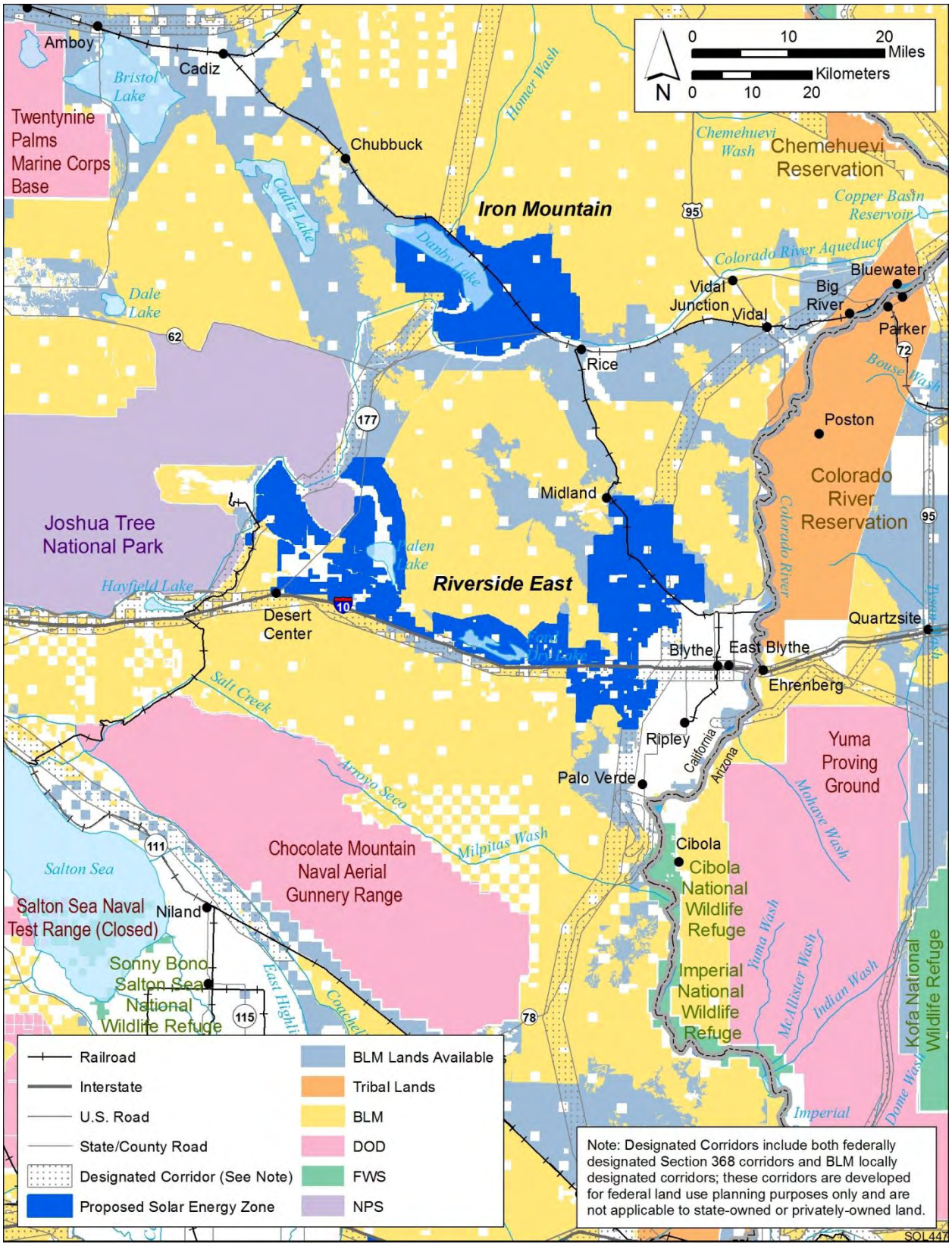
The Draft Solar PEIS identified a 500-kV transmission line that runs east–west parallel to the southern SEZ boundary as the nearest point for connection of the SEZ to the grid. In addition, a 230-kV line passes through the far western section of the SEZ, and a 69-kV line passes through the eastern portion of the SEZ. The location of new transmission that could be constructed for this SEZ in the future may be different from that assumed in the Draft Solar PEIS. Details on the updated transmission impact assessment to be included in the Final Solar PEIS are provided in Section C.7.1 of this appendix. Analysis of transmission lines and/or access roads will be completed, as necessary, as part of project-specific environmental reviews (see Section 2.2.2.2.2 of this Supplement).

A Section 368 federally designated energy corridor overlaps the SEZ along I-10.[10] In addition, there are two north–south corridors within the SEZ; one is located in the western portion of the SEZ, and one is in the eastern portion. These corridors could limit development in the SEZ because solar facilities cannot be constructed under transmission lines. The discussion of impacts of solar energy development in the SEZ in the Draft Solar PEIS acknowledged that the presence of the corridor would reduce the amount of land available for solar power production and that, conversely, full development of solar facilities within the SEZ would limit use of the transmission corridor.

Potential adverse impacts identified in the Draft Solar PEIS included the following:

- Solar development in the western portion of the SEZ would likely create conflict with existing residential use near Desert Center, Lake Tamarisk Resort, and scattered private residences.

[10] Section 368 of the Energy Policy Act of 2005 (Public Law 109-58) required federal agencies to engage in transmission corridor planning (see Section 1.6.2.1 of the Draft Solar PEIS). As a result of this mandate, the U.S. Department of the Interior Bureau of Land Management (BLM), U.S. Department of Energy (DOE), U.S. Forest Service (USFS), and U.S. Department of Defense (DoD) prepared a PEIS to evaluate the designation of energy corridors on federal lands in 11 western states, including the 6 states evaluated in this study (DOE and DOI 2008). The BLM and USFS issued Records of Decision to amend their respective land use plans to designate numerous corridors, often referred to as Section 368 corridors.



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2 **FIGURE C.2.2-1 Proposed Riverside East SEZ as Presented in the Draft Solar PEIS**

- Development in the SEZ would adversely affect wilderness characteristics in the Palen-McCoy, Rice Valley, Big Maria Mountains, Chuckwalla Mountains, and Little Chuckwalla Mountains Wilderness Areas (WAs) and in Joshua Tree National Park (NP). There is potential for adverse impacts on resources within the seven Areas of Critical Environmental concern (ACECs) in and near the SEZ. Solar facility development could adversely affect the scenic view from Joshua Tree NP, the natural soundscape, and the quality of the night sky environment as viewed from the National Park and WAs in the region.

- The BLM Midland Long Term Visitor Area (LTVA) is located within the SEZ, although the impact of solar development on the use of the LTVA by winter visitors is not known. Solar development would discourage recreational use in areas adjacent to the SEZ, including designated wilderness, undesignated public lands, and Joshua Tree NP.

- There is potential for adverse impacts on military use and training in eight military training routes (MTRs). Any solar facility that intrudes into military airspace would adversely affect the use of that airspace. The potential impact on operations of two civilian airports located within or adjacent to the SEZ will need to be considered if solar development is proposed.

- Impacts on soil resources (e.g., soil compaction, soil horizon mixing, soil erosion by wind and runoff, sedimentation, and soil contamination) could occur. Palen and Ford Dry Lakes may not be suitable locations for construction.

- Groundwater use would deplete the aquifer to the extent that, at a minimum, wet-cooling options would not be feasible. High total dissolved solids values of groundwater could produce water that is nonpotable and corrosive to infrastructure.

- Clearing of a large portion of the proposed SEZ could primarily affect wetland, riparian, playa, dry wash woodland, and chenopod scrub, depending on the amount of habitat disturbed. The establishment of noxious weeds could result in habitat degradation. Deposition of fugitive dust could cause reduced productivity or changes in plant community structure.

- Potentially suitable habitat for 69 special status species and more than 130 wildlife species occurs in the affected area of the proposed SEZ; between 1 and 10% of the potentially suitable habitat for most of these species occurs in the region that would be directly affected by development. For several dune-obligate special status species, up to 32% of the potentially suitable habitat in the region occurs in the area of direct effects.

- If aquatic biota exist within McCoy Wash, ephemeral washes, the Palen Lake or Ford Dry Lake, they could be affected by the direct removal of these

surface water features within the construction footprint. Some of these features may be defined as non-development areas, and such areas would not be directly affected by ground disturbance. Aquatic biota, if present, could also be indirectly affected by a decline in habitat quantity and quality due to water withdrawals and changes in drainage patterns, as well as increased sediment and contaminant inputs associated with ground disturbance and construction activities.

- Temporary exceedances of ambient air quality standards for particulate matter at the SEZ boundaries are possible during construction. These high concentrations, however, would be limited to the immediate area surrounding the SEZ boundary. Modeling indicates that emissions from construction activities could result in considerable impacts at the nearest Class I area (Joshua Tree NP), but the potential impacts would be temporary.

- Strong visual contrasts could be observed by visitors to Joshua Tree NP, Joshua Tree WA, Big Maria Mountains WA, Rice Valley WA, Corn Springs ACEC, travelers on I-10 and Route 177, and from the communities of Desert Center and Lake Tamarisk. Moderate to strong visual contrasts could be observed by visitors to the Little Chuckwalla Mountains WA. Weak to strong visual contrasts could be observed from the Chuckwalla Mountains WA, the Little Chuckwalla Mountains WA, the Bradshaw Trail BLM Backcountry Byway, and residents of Blythe, East Blythe, and Ripley. Weak to moderate visual contrast would be observed by visitors to the Palo Verde Mountains WA and residents of Ehrenberg and Palo Verde. The SEZ is located within the California Desert Conservation Area (CDCA), and substantial, immitigable visual impacts will occur within the CDCA in the SEZ and surrounding lands.

- During construction, noise levels at the nearest residences could be higher than the U.S. Environmental Protection Agency (EPA) guideline level. During operations, on the basis of analyses presented in the Draft Solar PEIS, noise levels at the nearest residences could be higher than the EPA guideline level if concentrating solar power facilities with energy storage technologies (which could extend the daily operational time by 6 hours or more) or if dish engine technologies were used at the SEZ.

- Impacts on significant paleontological resources are unknown, but could be high in some areas. Direct impacts on significant cultural resources could occur in the SEZ; numerous prehistoric and Native American sites and trails are potentially located within the SEZ and could be affected by solar energy development. Concerns have been expressed in the past over the Salt Song Trail, and solar development within the SEZ is likely to be visible from the trail. Additional features of potential concern include Big Maria, Coxcomb, and Eagle Mountains, Alligator Rock, Black Rock, and McCoy Springs. The Soboba Band of Luiseno Indians and the Quechan have expressed concern over highly sensitive areas within their Tribal Traditional Use Areas.

- Minority and low-income populations occur within a 50-mi (80-km) radius of the proposed SEZ boundary; thus adverse impacts of solar development could disproportionately affect minority and low-income populations.

C.2.2.2 Summary of Comments Received

Many of the comments received on the proposed Riverside East SEZ were in favor of identifying the area as an SEZ, with boundary adjustments (The California Public Utilities Commission, Center for Biological Diversity, California Energy Commission, Defenders of Wildlife, Natural Resources Defense Council [NRDC] et al.,[11] California Native Plant Society, and The Wildlands Conservancy). In particular, the Center for Biological Diversity recommended eliminating all Wildlife Habitat Management Areas (WHMAs) and the sand transport corridor. In addition, NRDC suggested that the microphyll woodlands and habitat connectivity areas also be excluded from solar energy development. The Cultural Resources Preservation Coalition and Partnership for the National Trails System proposed that lands within the western end of the SEZ be eliminated to avoid impacts on Joshua Tree National Park's cultural and natural resources. The National Parks Conservation Association also recommended reconfiguring the SEZ to avoid impacts on Joshua Tree National Park's southern and eastern border.

Residents of Lake Tamarisk and Desert Center opposed designating the area as an SEZ because of its proximity to the two towns. The California Desert Coalition and the Western Watersheds Project recommended that the Riverside East SEZ be eliminated because of occupied desert tortoise habitat and other wildlife habitat, important cultural sites, and off-highway vehicle use that would be affected by solar energy development. The Big Pine Paiute of the Owens Valley favored eliminating the area as an SEZ because of conflicts with environmentally and/or culturally sensitive resources.

Many commentors expressed concern for the potential impact on Joshua Tree NP and wildlife corridors. EnXco expressed concern over the proposed visual resource mitigation requirements for the Riverside East SEZ in the Draft Solar PEIS and other restrictions that would constrain solar energy development within the SEZ. The Society for American Archaeology expressed concern for impacts on Native American trails such as the Salt Song Trail and adequacy of government-to-government consultation. The EPA was concerned that full build-out of the Riverside East SEZ would be unlikely, given the groundwater availability and its potential impacts on groundwater resources and groundwater-dependent species. The Metropolitan Water District of Southern California was concerned about the transmission line assumptions made in the Draft Solar PEIS and questioned whether those lines would actually be available for interconnection.

[11] The Natural Resources Defense Council, Audubon Society, California Native Plant Society, California Wilderness Coalition, Californians for Western Wilderness, Defenders of Wildlife, the National Parks Conservation Association, Point Reyes Bird Observatory Conservation Science, Sierra Club, The Wilderness Society, and The Wildlands Conservancy submitted joint comments on the proposed California SEZs. Those comments are attributed to The Natural Resources Defense Council et al.

C.2.2.3 Changes to the SEZ

The proposed Riverside East SEZ has been reconfigured to eliminate 43,439 acres (176 km^2) in the northwest portion of the SEZ (see Figure C.2.2-2). Excluding this area will reduce impacts on Joshua Tree NP. In addition, 11,547 acres (46.7 km^2) within the SEZ boundaries have been identified as non-development areas. These areas consist of intermittent lakes, major washes, and areas identified for non-development through investigations for approved projects. The remaining developable area within the SEZ is 147,910 acres (598.6 km^2).

To reduce the visual resource impacts of solar development within the proposed Riverside East SEZ which is proximate to and at a lower elevation than Joshua Tree NP and several WAs, SEZ-specific visual resource mitigation requirements have been developed. All forms of development within the area identified as needing to meet Visual Resource Management (VRM) Class II-consistent objectives in the Draft Solar PEIS will be limited to 10 ft (3.3 m) or under, and technology will be restricted to either photovoltaic technologies of less than 10 ft (3.3 m), or technologies with comparable or lower height and reflectivity. Within the area of the SEZ that was identified as needing to meet VRM Class III-consistent objectives in the Draft Solar PEIS, the solar development will be restricted to either PV technologies of less than 10 ft (3.3 m), or technologies with comparable or lower heights and reflectivity. Additional required mitigation measures to address potential visual resource impacts are given in Section C.7.3 of this appendix.

The lands that had composed the northwest area of the proposed SEZ that are being eliminated from the SEZ through this Supplement will be considered solar right-of-way exclusion areas; that is, applications for solar development on these lands will not be accepted by the BLM. Additionally, lands within the SEZ identified during investigations for approved projects as areas where solar energy development should not occur will be defined as non-development areas.

All proposed projects within the Riverside East SEZ will continue to be reviewed by California's Renewable Energy Action Team (see Section 2.2.2.2.6 of this Supplement) to ensure consistency with the ongoing efforts of the Desert Renewable Energy Conservation Plan, minimize impacts on habitat connectivity, and address other resource concerns in the SEZ area.

C.2.2.4 Wilderness Character Status of SEZ

A recently maintained inventory of wilderness characteristics was used to determine whether public lands within the proposed Riverside East SEZ have wilderness characteristics. The inventory found that approximately 11,925 acres (48.3 km^2) on the eastern side of the SEZ (in the area of McCoy Wash) have wilderness characteristics. The lands are shown in Figure C.2.2-3.

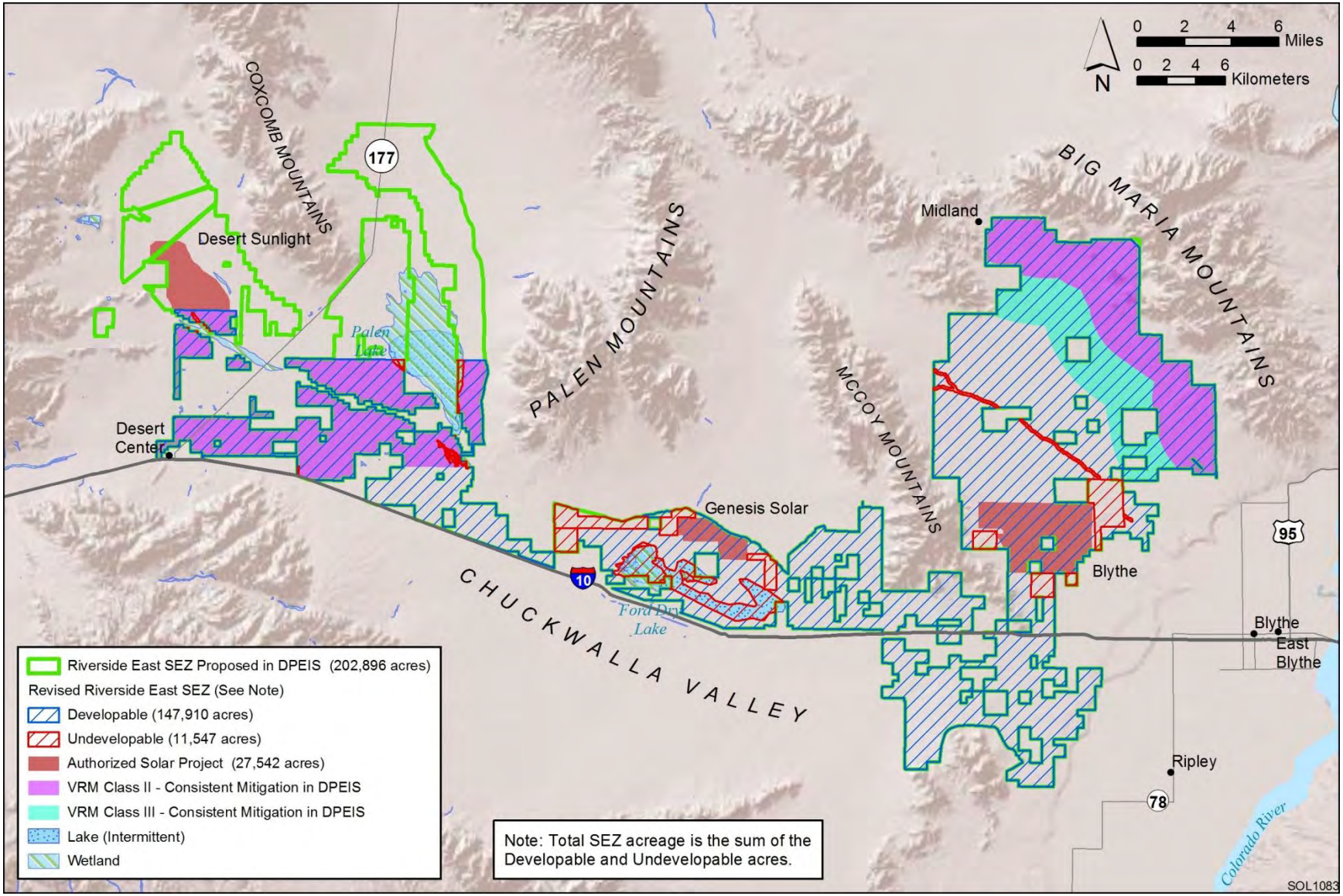


FIGURE C.2.2-2 Proposed Riverside East SEZ as Described in this Supplement

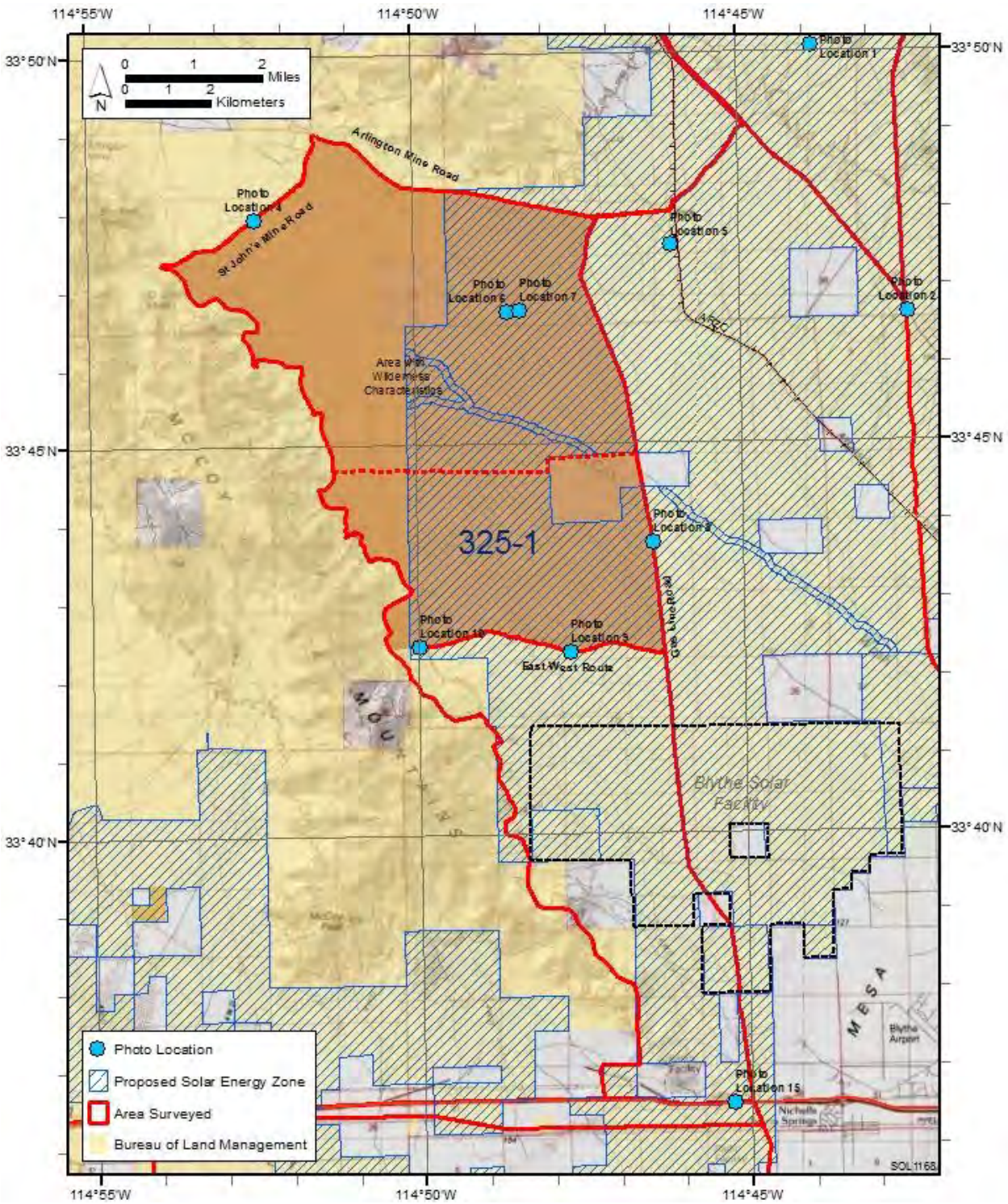


FIGURE C.2.2-3 Area within the Proposed Riverside East SEZ with Wilderness Characteristics

C.2.2.5 Additional Data Collection Recommended

C.2.2.5.1 Lands and Realty

None.

C.2.2.5.2 Specially Designated Areas and Lands with Wilderness Characteristics

None.

C.2.2.5.3 Rangeland Resources

Livestock Grazing. None.

Wild Horses and Burros. None.

C.2.2.5.4 Recreation

None.

C.2.2.5.5 Military and Civilian Aviation

The BLM will continue to consult with the DoD regarding potential issues with MTRs. The potential impact of power towers in this SEZ, including the ability of power towers to comply with Federal Aviation Administration regulations pertaining to air navigation obstructions, could be further investigated.

C.2.2.5.6 Geologic Setting and Soil Resources

None.

C.2.2.5.7 Minerals

Additional information on leasable and strategic minerals in the vicinity of the proposed SEZ will be provided in the Final Solar PEIS to inform the Department of the Interior's decision on a proposed 20-year withdrawal of SEZ lands.

C.2.2.5.8 Water Resources

The following additional data and actions would help further characterize potential impacts on water resources for the proposed Riverside East SEZ. A more detailed discussion of each of these activities is included in the water resources action plan provided in Section C.7.2 of this appendix.

- Prepare a planning-level water resources inventory of the Chuckwalla and Palo Verde Mesa basins.

- Identify additional ephemeral stream channels and alluvial fan features for non-development areas through consultation with the California Department of Fish and Game (CDFG), California BLM, EPA, and U.S. Army Corps of Engineers (USACE) with a focus on (moving west to east):
  - Alluvial fans and sand dune features surrounding Palen Lake and western face of Coxcomb Mountains,
  - Alluvial fan features on south face of Palen Mountains,
  - Alluvial fan features on western and southern faces of McCoy Mountains,
  - Alluvial fan features on western, northern, and eastern faces of Mule Mountains,
  - Ephemeral headwater channels of McCoy Wash,
  - Alluvial fan features on eastern face of McCoy Mountains,
  - Alluvial fan features on southern and eastern faces of Little Maria Mountains, and
  - Alluvial fan features on western face of Big Maria Mountains.

- Perform field surveys and hydrologic analyses to support jurisdictional water determinations and floodplain identifications. Tasks include:
  - Surveying select stream channels and alluvial fan features for elevations, high water marks, and sediment conditions, and
  - Conducting hydrologic rainfall-runoff-routing analyses to identify 100-year floodplain areas.

- Coordinate with the USACE (Los Angeles District) regarding jurisdictional water determinations. Water features to be considered include:
  - McCoy Wash and its tributaries.

- Identify 100-year floodplain exclusion areas for the SEZ. This task would require coordination with the California Department of Water Resources (Division of Flood Management), the Riverside County Flood Control and Water Conservation District, and the Southern California Alluvial Fan Task Force.

- Describe the formation of a stakeholder committee to conduct long-term monitoring of water resources. This activity would entail:
  - Identifying key stakeholder agencies;

  - Discussing general features of a monitoring program;
  - Providing recommendations of surface monitoring of ephemeral stream networks through consultations with CDFG, California BLM, EPA, and USACE; and
  - Working with the U.S. Geological Survey to develop groundwater monitoring well design and numerical groundwater models.

- Develop a modified version of the Leake et al. (2008) superposition groundwater model in order to estimate potential impacts of full-build-out groundwater pumping scenarios (according to estimated, technology-specific water requirements) to include:
  - Assessing the potential for drawdown impacts on the Colorado River Accounting Surface;
  - Coordinating with the U.S. Bureau of Reclamation (managing agency of Colorado River Act) regarding results and implications;
  - Assessing the potential for drawdown impacts on Palen Lake (wet playa) and other surface water features identified in planning level inventory; and
  - Assess ting the potential for drawdown impacts on other groundwater users of the Chuckwalla and Palo Verde Mesa basins.

C.2.2.5.9 Ecological Resources

Vegetation and Plant Communities. The following additional data-gathering actions would help further characterize potential impacts on vegetation and plant communities for the proposed Riverside East SEZ:

- Identify and map the location and areal extent of desert dry washes, dry wash woodland/microphyll woodland (including ironwood forest), riparian (including mesquite bosque), desert chenopod scrub, and wetland habitats within the SEZ. Identify and map the location and areal extent of these habitats, as well as bush seep-weed (Suaeda moquinii) communities, outside the SEZ that could be affected by hydrologic changes, including groundwater elevations, and changes in water, sediment, and contaminant inputs associated with runoff. Such efforts could determine habitat characteristics, including water source, hydrologic regime, and dominant plant species.

- Identify and map the location and areal extent of sand dunes and sand transport systems within the SEZ.

- Identify and map the location of cactus, including barrel cactus and cholla, and Yucca species, within the SEZ.

Wildlife. The following additional data-gathering actions would help further characterize potential impacts on wildlife resources for the SEZ:

- Conduct pre-disturbance surveys within the SEZ to determine the use of the SEZ as a movement/migratory corridor or as important habitat for mule deer.

- Identify and map the location and areal extent of wash and playa habitats within the SEZ (see Section C.2.2.5.8 above). These areas are important habitat for a number of wildlife species.

Aquatic Biota. Investigations recommended under the water resources action plan (Section C.2.2.5.8) would be useful in characterizing and protecting habitat available to aquatic biota. No surveys are necessary for surface water features that have been identified as non-development areas (e.g., McCoy Wash). However, if it is determined that the surface water features in the non-development areas could be affected indirectly by water withdrawals, changes in drainage patterns, and construction activities, the potential for aquatic communities in these areas to be affected could require further investigation prior to development. Other surface water features within the SEZ not identified as non-development zones may contain aquatic biota; therefore, preliminary evaluations of these surface water features could be conducted to determine the potential for aquatic communities to be present.

Special Status Species. The following additional data-gathering actions would be useful in further characterizing and protecting habitat available to special status species:

- Conduct pre-disturbance surveys within the SEZ to determine the presence and abundance of those special status species that are federally listed, proposed for listing, or candidates for listing under the Endangered Species Act; (2) listed by the State of California as endangered, threatened, or fully protected; or (3) designated as sensitive by the California BLM State Office. These species are listed in Table C.2.2-1. Surveys should focus on areas identified as potentially suitable and the suitability of these habitats to support these special status species should be determined in the field. All field-determined suitable habitats for special status species should be mapped. Target species and survey protocols should be developed in coordination with the U.S. Fish and Wildlife Service (USFWS) and CDFG.

  The Draft Solar PEIS presents a table of special status species for which potential impacts need to be evaluated prior to development in the proposed Riverside East SEZ. The list of species presented in Table 9.4.12.1-1 of the Draft Solar PEIS also includes species listed by the State of California and species ranked by the States of California or Arizona as S1 or S2, or species of concern by the State of California. Based on the design features presented in the Draft Solar PEIS, the potential for impacts on these additional species will also need to be addressed before development could occur in the SEZ.

TABLE C.2.2-1 Special Status Species That May Occur near the Proposed Riverside East SEZ[a]

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Plants			
Alkali mariposa-lily	*Calochortus striatus*	BLM-S	Alkaline seeps, springs, and meadows at elevations between 2,600 and 4,600 ft.[d] Nearest recorded occurrences are 40 mi[e] west of the SEZ. About 68,658 acres[f] of potentially suitable habitat occurs within the SEZ region.
Chaparral sand-verbena	*Abronia villosa* var. *aurita*	BLM-S	Endemic to southern California. Inhabits chaparral desert sand dunes at elevations between 350 and 5,250 ft. Historically occurred on and in the vicinity of the SEZ; the species has not been recorded in the project area since 1964. Most recent recorded occurrences are 23 mi from the SEZ. About 84,357 acres of potentially suitable habitat occurs within the SEZ region.
Creamy blazing star	*Mentzelia tridentata*	BLM-S	Mojave desert creosotebush scrub communities on rocky and sandy substrates at elevations below 3,900 ft. Nearest recorded occurrences are 45 mi west of the SEZ. About 2,215,155 acres of potentially suitable habitat occurs within the SEZ region.
Giant spanish-needle	*Palafoxia arida* var. *gigantea*	BLM-S	Desert sand dune habitats at elevations below 330 ft. Nearest recorded occurrences are 40 mi south of the SEZ. Suitable habitat may exist on the site. About 84,168 acres of potentially suitable habitat occurs within the SEZ region.
Harwood's eriastrum	*Eriastrum harwoodii*	BLM-S	Known from fewer than 20 occurrences in southern California on desert dunes and other sandy habitats at elevations between 650 and 3,000 ft. Nearest recorded occurrence is 15 mi northwest of the SEZ in the Pinto Mountains DWMA (Desert Wildlife Management Area). About 84,168 acres of potentially suitable habitat occurs within the SEZ region.
Latimer's woodland-gilia	*Saltugilia latimeri*	BLM-S	Mojave Desert scrub communities, pinyon-juniper woodlands, and washes on rocky or sandy substrates at elevations between 1,300 and 6,500 ft. Nearest recorded occurrence is 30 mi west of the SEZ. About 2,920,277 acres of potentially suitable habitat occurs within the SEZ region.

TABLE C.2.2-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Plants (Cont.)			
Little San Bernardino Mountains linanthus	*Linanthus maculatus*	BLM-S	Known from fewer than 20 occurrences in southern California near Joshua Tree NP in desert dunes and sandy flats with creosotebush scrub and Joshua tree woodland communities at elevations less than 6,900 ft. Nearest recorded occurrences are 30 mi west of the SEZ. About 84,168 acres of potentially suitable habitat occurs within the SEZ region.
Munz's cholla	*Opuntia munzii*	BLM-S	Gravelly or sandy to rocky soils, often on lower bajadas, washes, flats, hills and canyon sides in Sonoran Desert creosotebush shrub communities at elevations below 3,280 ft. Nearest recorded occurrences are from the Chuckwalla DWMA, approximately 20 mi south of the SEZ. About 4,187,934 acres of potentially suitable habitat occurs within the SEZ region.
Orocopia sage[g]	***Salvia greatae***	BLM-S	Creosotebush scrub communities and dry washes at elevations less than 2,600 ft. Known to occur in the affected area. Nearest occurrences are from the Chuckwalla DWMA about 2 mi south of the SEZ. About 2,853,196 acres of potentially suitable habitat occurs within the SEZ region.
White-margined beardtongue	*Penstemon albomarginatus*	BLM-S	Desert sand dune habitats and Mojave Desert scrub communities at elevations below 3,600 ft. Nearest recorded occurrences are 50 mi north of the SEZ. About 2,366,404 acres of potentially suitable habitat occurs within the SEZ region.
Reptiles			
Desert tortoise	***Gopherus agassizii***	ESA-T; CA-T	Mojave and Sonoran Deserts in desert creosotebush communities on firm soils for digging burrows, along riverbanks, washes, canyon bottoms, creosote flats, and desert oases. Known to occur on the SEZ (western and northeastern portions) and in the affected area. About 4,205,025 acres of potentially suitable habitat occurs within the SEZ region.

TABLE C.2.2-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Reptiles (Cont.)			
Mojave fringe-toed lizard	*Uma scoparia*	BLM-S	Sandy habitats in the Mojave Desert from Death Valley south to the Colorado River near Blythe, California and extreme western Arizona. Sparsely-vegetated desert areas with fine windblown sand, including dunes, flats, and washes at elevations below 3,000 ft. Nearest recorded occurrences are 25 mi north of the SEZ. About 1,840,628 acres of potentially suitable habitat occurs within the SEZ region.
Rosy boa	*Charina trivirgata*	BLM-S	Southeastern California and western Arizona in scrublands, rocky deserts, and canyons with permanent or intermittent streams. Nearest recorded occurrences are from Joshua Tree NP, approximately 25 mi west of the SEZ. About 4,171,153 acres of potentially suitable habitat occurs within the SEZ region.
Birds			
Bendire's thrasher	***Toxostoma bendirei***	BLM-S	Summer resident in the SEZ region in a variety of desert habitats with fairly large shrubs or cacti and open ground, or open woodland with scattered shrubs and trees, between 0 and 1,180 ft elevation. Nearest recorded occurrence is 2 mi south of the SEZ in the Chuckwalla DWMA. About 2,526,161 acres of potentially suitable habitat occurs within the SEZ region.
Ferruginous hawk	*Buteo regalis*	BLM-S	Winter resident and migrant in the SEZ region at lower elevations in open grasslands, shrublands, sagebrush flats, desert scrub, desert valleys, and fringes of pinyon-juniper habitats. Occurs in Riverside County, California in the SEZ region. About 1,978,858 acres of potentially suitable habitat occurs within the SEZ region.
Gila woodpecker	*Melanerpes uropygialis*	CA-E	Year-round resident in the SEZ region along the Colorado River in desert riparian and desert wash habitats, orchards, vineyards, and urban habitats. Nearest recorded occurrence is from the Colorado River, approximately 6 mi east of the SEZ. About 297,582 acres of potentially suitable habitat occurs within the SEZ region.

TABLE C.2.2-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Birds (Cont.)			
Western burrowing owl	***Athene cunicularia hypugaea***	BLM-S	Year-round resident in the SEZ region. Open areas with short, sparse vegetation, including grasslands, agricultural fields, and disturbed areas. Nests in burrows created by mammals or tortoises. Known to occur in the affected area. Nearest occurrences are within 1 mi east of the SEZ. About 4,653,092 acres of potentially suitable habitat occurs within the SEZ region.
Mammals			
California leaf-nosed bat	***Macrotus californicus***	BLM-S	Year-round resident in SEZ region in desert riparian, desert wash, desert scrub, and palm oasis habitats at elevations below 2,000 ft. Roosts in mines, caves, and buildings. Known to occur in the affected area. Nearest recorded occurrences are from the Palen/McCoy Wilderness within 2 mi of the SEZ. About 3,973,317 acres of potentially suitable habitat occurs within the SEZ region.
Cave myotis	***Myotis velifer***	BLM-S	Year-round resident in SEZ region in desert scrub, shrublands, washes, and riparian habitats. Roosts in colonies in caves. Known to occur in the affected area. Nearest recorded occurrence is from the Mule Mountains ACEC about 2 mi south of the SEZ. About 4,136,719 acres of potentially suitable habitat occurs within the SEZ region.
Nelson's bighorn sheep	***Ovis canadensis nelsoni***	BLM-S	Open, steep rocky terrain in mountainous habitats of the eastern Mojave and Sonoran Deserts in California. Rarely uses desert lowlands, except as corridors for travel between mountain ranges. Known to occur in the affected area. Nearest recorded occurrences are from the Joshua Tree Wilderness and the Chuckwalla DWMA, about 2 mi north, west, and south of the SEZ. About 1,896,141 acres of potentially suitable habitat occurs within the SEZ region.
Pallid bat	***Antrozous pallidus***	BLM-S	Year-round resident in SEZ region in low-elevation desert communities, including grasslands, shrublands, and woodlands. Roosts in caves, crevices, and mines. Known to occur in the affected area. Nearest recorded occurrence is from the Chuckwalla Mountains Wilderness approximately 5 mi south of the SEZ. About 3,668,119 acres of potentially suitable habitat occurs within the SEZ region.

TABLE C.2.2-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Mammals (Cont.)			
Palm Springs pocket mouse	*Perognathus longimembris bangsi*	BLM-S	Creosote scrub, desert scrub, and grasslands on loose or sandy soils. Nearest recorded occurrence is from the Chuckwalla DWMA, approximately 25 mi west of the SEZ. About 3,749,649 acres of potentially suitable habitat occurs within the SEZ region.
Spotted bat	*Euderma maculatum*	BLM-S	Year-round resident in SEZ region in deserts, grasslands, and mixed coniferous forests at elevations below 10,000 ft. Roosts in caves, rock crevices, and buildings. Nearest recorded occurrence is 40 mi west of the SEZ. Suitable habitat exists on the site. About 2,363,936 acres of potentially suitable habitat occurs within the SEZ region.
Townsend's big-eared bat	***Corynorhinus townsendii***	BLM-S	Year-round resident in SEZ region in all habitats but subalpine and alpine habitats, and at any season. Roosts in caves, mines, tunnels, buildings, or other man-made structures. Known to occur in the affected area. Nearest recorded occurrences are approximately 4 mi southeast of the SEZ. About 5,065,765 acres of potentially suitable habitat occurs within the SEZ region.
Western mastiff bat	***Eumops perotis californicus***	BLM-S	Year-round resident in SEZ region in open semiarid habitats, including conifer and deciduous woodlands, shrublands, grasslands, chaparral, and urban areas. Roosts in crevices in cliff faces, buildings, and tall trees. Known to occur in the affected area. Nearest recorded occurrence is 5 mi south of the SEZ. About 4,069,881 acres of potentially suitable habitat occurs within the SEZ region.
Western small-footed myotis	*Myotis ciliolabrum*	BLM-S	Year-round resident in SEZ region in woodland and riparian habitats at elevations below 9,000 ft. Roosts in caves, buildings, mines, and crevices of cliff faces. Nearest recorded occurrence is from the Chocolate Mountains, approximately 30 mi south of the SEZ. About 661,873 acres of potentially suitable habitat occurs within the SEZ region.

TABLE C.2.2-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Birds			
Western yellow bat	*Lasiurus xanthinus*	BLM-S	Year-round resident in SEZ region in desert riparian, desert wash, and palm oasis habitats at elevations below 2,000 ft. Roosts in trees. Nearest recorded occurrence is from Blythe, California, approximately 6 mi east of the SEZ. About 1,340,978 acres of potentially suitable habitat occurs within the SEZ region.

[a] The listings for (1) federally listed, proposed for listing, or candidates for listing under the ESA, and (2) California BLM State Office sensitive species have been updated since the release of the Draft Solar PEIS.

[b] BLM-S = listed as a sensitive species by the BLM; CA-E = listed as endangered by the State of California; CA-T = listed as threatened by the State of California; ESA-T = listed as threatened under the ESA..

[c] For plant and invertebrate species, potentially suitable habitat was determined using California Regional Gap Analysis Project (CAReGAP) and Southwest Regional Gap Analysis Project (SWReGAP) land cover types (USGS 2005, 2010). For reptile, bird, and mammal species, potentially suitable habitat was determined using CAReGAP and SWReGAP habitat suitability models as well as CAReGAP and SWReGAP land cover models. Area of potentially suitable habitat for each species is presented for the SEZ region, defined as the area within 50 mi (80 km) of the SEZ center.

[d] To convert ft to m, multiply by 0.3048.

[e] To convert mi to km, multiply by 1.609.

[f] To convert acres to km^2, multiply by 0.004047.

[g] Species in bold text have been recorded or have designated critical habitat in the affected area.

- Identify and map the location and areal extent of desert playa and wash habitats within the SEZ, including habitat characteristics (such as water source, hydrologic regime, and dominant plant species) both within the habitat boundaries and in adjacent habitats. Species potentially associated with these habitats include alkali mariposa-lily, California saw-grass, Coves' cassia, Emory's crucifixion-thorn, jackass-clover, Salt Spring checkerbloom, sand evening-primrose, Roberts' rhopalolemma bee, and crissal thrasher.

- Identify and map the location and areal extent of sand dunes and sand transport systems on the SEZ. Species potentially associated with these habitats include chaparral sand-verbena, dwarf germander, giant Spanish-needle, Harwood's eriastrum, jackass-clover, Little San Bernardino Mountains linanthus, and Mojave fringe-toed lizard.

- Identify and map the location and areal extent of woodland habitats on the SEZ should be determined and mapped. Species potentially associated with

these habitats include loggerhead shrike, Lucy's warbler, Arizona myotis, and western yellow bat.

- Identify and map the location and areal extent of rocky cliff and outcrop habitats on the SEZ. Species potentially associated with these habitats include California leaf-nosed bat (roosting), cave myotis (roosting), Nelson's bighorn sheep, pallid bat (roosting), pocketed free-tailed bat (roosting), spotted bat (roosting), Townsend's big-eared bat (roosting), western mastiff bat (roosting), and western small-footed myotis (roosting).

C.2.2.5.10 Air Quality and Climate

None.

C.2.2.5.11 Visual Resources

Visual resources will be re-evaluated for the Final Solar PEIS based on the boundary adjustments and proposed technology restrictions described in Section C.2.2.3 of this Supplement. A summary of the Draft Solar PEIS visual contrast analysis for the Riverside East SEZ is provided in Table C.2.2-2. This table includes only the resources that would be subject to moderate or strong visual contrast. The Draft Solar PEIS visual impact analysis predicted these levels of visual contrast from solar energy development in the Riverside East SEZ for the following sensitive visual resource areas (SVRAs) and sensitive viewing locations (SVLs):

- California Desert Conservation Area
- Joshua Tree NP
- Big Maria Mountains WA
- Chuckwalla Mountains WA
- Joshua Tree WA
- Little Chuckwalla Mountains WA
- Palen-McCoy WA
- Palo Verde Mountains WA
- Rice Valley WA
- Corn Springs ACEC

TABLE C.2.2-2 Summary of Potential Visual Impacts on SVRAs and SVLs within the 25-mi (40-km) Viewshed of the Proposed Riverside East SEZ

Management Area Category	SVRA/SVL within 25 mi[a] of SEZ	Total Acreage/ Mileage[a,b,c] of SVRA/SVL	Distance from SEZ at Point of Closest Approach[d]	Total Acreage/ Mileage Visible within 25 mi[e]	Percentage of Total Acreage/ Mileage Visible within 25 mi	Notes[f]
National Conservation Area (NCA)	CDCA	25,919,319 acres	Riverside East SEZ is located within the CDCA.	1,494,552 acres	5.8	Construction and operation of solar facilities would result in strong visual contrasts within the SEZ viewshed that might not be completely mitigated
NP	Joshua Tree	793,331 acres	The eastern boundary of the NP is adjacent to the SEZ's northwestern boundary, and other portions are located between 0.2 and 2.5 mi of the SEZ.	117,591 acres	14.8	Strong visual contrasts could be observed by NP and WA visitors. The 650-ft viewshed extends approximately 14.2 mi into the NP from the northwestern boundary of the SEZ.
Scenic Highway	Bradshaw Trail[g]	70 mi	Near the southeastern corner of the SEZ, passes within 1.7 mi of the SEZ and parallels the SEZ at roughly that distance for more than 6 mi.	23 mi	32.9	Weak to strong visual contrasts could be observed within and near the SEZ by travelers.
WAs	Big Maria Mountains	46,056 acres	0.3 mi east of the SEZ	8,873 acres	19.3	Strong visual contrasts could be observed by WA visitors.
	Chuckwalla Mountains	88,202 acres	1.1 mi south of the western portion of the SEZ	49,952 acres	56.6	Weak to strong visual contrasts could be observed by WA visitors.

TABLE C.2.2-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi[a] of SEZ	Total Acreage/ Mileage[a,b,c] of SVRA/SVL	Distance from SEZ at Point of Closest Approach[d]	Total Acreage/ Mileage Visible within 25 mi[e]	Percentage of Total Acreage/ Mileage Visible within 25 mi	Notes[f]
WAs (Cont.)	Joshua Tree	586,623 acres	Same as for the Joshua Tree NP	99,460 acres	17.0	Strong visual contrasts could be observed by NP and WA visitors.
	Little Chuckwalla Mountains	28,708 acres	5.0 mi south of the SEZ	16,679 acres	58.1	Moderate to strong visual contrasts could be observed by WA visitors.
	Palen-McCoy	224,414 acres	Adjacent to the northern and eastern boundaries of the western portion of the SEZ	170,666 acres	76.0	Weak to strong visual contrasts could be observed by WA visitors.
	Palo Verde Mountains	30,403 acres	6.2 mi south of the SEZ	13,254 acres	43.6	Weak to moderate visual contrasts could be observed by WA visitors.
	Rice Valley	43,412 acres	0.5 mi north of the SEZ	35,773 acres	82.4	Strong visual contrasts could be observed by WA visitors; WA includes portion of Big Maria Mountains.
ACECs designated for outstanding scenic values	Corn Springs	2,463 acres	4.8 mi south of the SEZ	1,075 acres	43.6	Strong visual contrasts could be observed by ACEC visitors. Portions of the ACEC within the viewshed extend from the nearest approach to approximately 5.9 mi from the SEZ.

TABLE C.2.2-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi[a] of SEZ	Total Acreage/ Mileage[a,b,c] of SVRA/SVL	Distance from SEZ at Point of Closest Approach[d]	Total Acreage/ Mileage Visible within 25 mi[e]	Percentage of Total Acreage/ Mileage Visible within 25 mi	Notes[f]
Other Areas of Interest (non-management areas)	I-10[h]	2,460 mi	Passes through the SEZ for a distance of approximately 4.0 mi, abuts the southern boundary of the SEZ for an additional 1.7 mi, and is within 0.67 mi of the SEZ for an additional 34 mi.	79 mi	3.2	Strong levels of visual contrast would be expected as travelers in both directions approached and passed through the SEZ.
	State Route 177	NA[i]	Passes through or is immediately adjacent to the SEZ for a distance of approximately 8.4 mi.	27	NA[k]	Solar energy development could potentially cause strong visual contrasts for travelers and would likely dominate the view from some locations: generally open views of the SEZ throughout the viewshed. However, solar collector/reflector arrays within the SEZ would be seen nearly edge-on. This would reduce their apparent size, conceal their strong regular geometry, and cause them to repeat the horizontal line of the plain in which the SEZ is situated.
	Blythe[j]	16,013 acres	8.3 mi east of the SEZ	NA	NA	Moderate to strong visual contrasts may be observed.
	East Blythe[j]	326 acres	9.6 mi east of the SEZ	NA	NA	Moderate to strong visual contrasts may be observed.

TABLE C.2.2-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi[a] of SEZ	Total Acreage/ Mileage[a,b,c] of SVRA/SVL	Distance from SEZ at Point of Closest Approach[d]	Total Acreage/ Mileage Visible within 25 mi[e]	Percentage of Total Acreage/ Mileage Visible within 25 mi	Notes[f]
Other Areas of Interest (non-management areas) (*Cont.*)	Ehrenberg[k]	NA	13 mi east of the SEZ	NA	NA	Contrast levels would be expected to be weak to moderate.
	Palo Verde[j]	378 acres	5.8 mi south of the SEZ	NA	NA	Weak to moderate visual contrasts may be observed.
	Ripley[k]	NA	4.5 mi east of the SEZ	NA	NA	Moderate to strong visual contrasts may be observed.
	Desert Center[k]	NA	Adjacent to the southwest boundary of the SEZ	NA	NA	Strong visual contrasts may be observed.

[a] To convert mi to km, multiply by 1.609.

[b] To convert acres to km^2, multiply by 0.004047.

[c] Mileage (within all columns) is used only for trails or roads, unless otherwise specified.

[d] Distances at the point of closest approach are based on the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries would result in changes to these calculations.

[e] The total acreage/mileage visible within 25 mi (40 km) of the SEZ is based on the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries would result in changes to these acreages/mileages, as well as the percent total acreages/mileages visible within 25 mi (40 km) of the SEZ.

[f] The assessment of impacts is based the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries may result in reduced impacts in some of the SVRAs/SVLs due to the reduction in the overall footprint of the SEZ.

[g] Length of Bradshaw Trail: BLM California (2011).

[h] Length of I-10: AA Roads' Interstate Guide (2006b).

[i] NA = data not available.

[j] Acreage of California Towns/Cities: U.S. Bureau of the Census (2011c).

[k] Acreage of Arizona Towns: U.S. Bureau of the Census (2011d).

- Bradshaw Trail Scenic Highway
- I-10
- State Route 177
- Communities of Blythe, East Blythe, Ehrenberg, Palo Verde, Ripley, and Desert Center.

The following steps could be taken to better understand potential impacts on these SVRAs and SVLs from solar development in the Riverside East SEZ:

- Identify key observation points (KOPs) within these areas through working with the management agency or other local stakeholders.
- Conduct viewshed analyses from the KOPs to determine how much of the SEZ would be in view from each KOP.
- As deemed necessary, based on viewshed analysis results, prepare wireframe Google Earth™ visualizations of hypothetical solar facilities in the SEZ depicting the 80% development scenario to better estimate potential impacts.

This additional analysis may help judge potential visual contrast more accurately for most KOPs. For KOPs of particularly high sensitivity, a site visit with photography and superimposition of the wireframe models onto the photos might be required or desired.

A visual resource inventory (VRI) was conducted for the area including the Riverside East SEZ in 2010. The area was re-examined in 2011 for maintenance of an inventory for lands with wilderness characteristics. Because these two efforts reached somewhat different conclusions concerning visual resource values on the eastern side of the McCoy Mountains and the western face of the Big Maria Mountains, additional analysis of the visual values in these areas may be needed to determine if adjustments to the SEZ-specific mitigation identified in the Draft Solar PEIS are warranted.

Additional required mitigation measures to address potential visual resource impacts are given in Section C.7.3 of this appendix.

C.2.2.5.12 Acoustic Environment

None.

C.2.2.5.13 Paleontological Resources

The BLM Regional Paleontologist will be contacted to determine whether additional information is available regarding Potential Fossil Yield Classification (PFYC) identifications in

California, such as from recent solar applications in which paleontological surveys were completed. A preliminary paleontological survey could be conducted to determine the PFYC of the SEZ, in order to update the temporary assignment of PFYC 3b used in the Draft Solar PEIS for most of the SEZ.

C.2.2.5.14 Cultural Resources and Native American Concerns

Approximately 108 surveys for cultural resources have occurred in the revised Riverside East SEZ area, identifying about 327 sites within the SEZ. At least six of these sites are considered eligible for listing in the *National Register of Historic Places* (NRHP). At least 160 sites have been recorded within 5 mi (8 km) of the larger, original SEZ footprint. As with other SEZs, dune areas and areas along washes and dry lakes have the highest potential for containing significant archaeological resources. Several culturally-important areas have also been identified near the SEZ, including specific mountain ranges and peaks, rock formations, geoglyphs and rock art, sacred trails, ACECs, and important water sources. The destruction and degradation of important plant resources and the destruction of habitat or impediments to the movement of culturally important wildlife are also potential impacts of concern within the SEZ.

The following additional data collection efforts could reduce the uncertainty about potential impacts on cultural resources:

- Incorporate the Class I literature file search currently being conducted by SWCA Environmental Consultants on behalf of the BLM.

- Conduct a Class II reconnaissance level stratified random sample survey of the SEZ to achieve a 10% sample (a total of approximately 15,959 acres [64.5 km^2], but will be less than that once it is determined through the Class I review how many acres have already been sufficiently surveyed).[12] Areas of interest, such as dune areas and along washes and dry lakes, as determined through the Class I review, should also be identified prior to establishing the survey design and sampling strategy. If appropriate, some subsurface testing of dune areas should be considered in the sampling strategy as well.

- Prepare a cultural sensitivity map based on the results of the Class I and Class II studies (and incorporating the results of the Desert Renewable Energy Conservation Plan cultural sensitivity map, if available).

- Continue government-to-government consultation as described in Section 2.4.3, including follow-up to recent ethnographic studies with Tribes not included in the original studies in Utah and Nevada to determine whether those Tribes have similar concerns or whether they would want to participate in a similar ethnographic study. The Riverside East SEZ falls in the traditional

[12] The BLM plans to conduct a Class II survey of 5% of this SEZ prior to the Final Solar PEIS. Additional areas could be surveyed as funding becomes available.

use area of the Serrano, Cahuilla, Quechan, Mohave, and Chemehuevi. Potential topics presented in the Draft Solar PEIS to be discussed during consultation include the proposed Prehistoric Trail Network Cultural Landscape/Historic District, which includes the Salt Song Trail, the *Xam Kwatcan* Trail, and the Cocomaricopa Trail; effects of workers and increased traffic on sacred sites; the loss of culturally important plants; the use and availability of water and the contamination of groundwater; ecological segmentation; important natural landscape features, such as the Big Marias, Coxcomb Mountains, Eagle Mountain, Alligator Rock, Black Rock, Palen Dry Lake, Ford Dry Lake, McCoy Springs, Corn Springs; local shrines and sacred sites; and several nearby ACECs and NRHP-listed properties, such as the Blythe Intaglios.

C.2.2.5.15 Socioeconomics and Environmental Justice

None.

C.2.2.5.16 Cumulative Impact Considerations

None.

C.3 COLORADO PROPOSED SOLAR ENERGY ZONES

C.3.1 Antonito Southeast

C.3.1.1 Summary of Potential Impacts Identified in the Draft Solar Programmatic Environmental Impact Statement (PEIS)

The proposed Antonito Southeast solar energy zone (SEZ), as presented in the Draft Solar PEIS, had a total area of 9,729 acres (39.4 km^2). It is located in Conejos County on the southern Colorado state boundary with New Mexico (Figure C.3.1-1). The largest nearby town, Alamosa, is located about 34 mi (55 km) to the north of the SEZ. Several small towns lie closer to the SEZ, with Antonito, Colorado about 2 mi (3 km) to the northwest of the SEZ.

The Draft Solar PEIS identified a 69-kV transmission line that is located about 4 mi (6 km) north of the SEZ as the nearest point for connection of the SEZ to the grid. The location of new transmission that could be constructed for this SEZ in the future may be different from that assumed in the Draft Solar PEIS. Details on the revised transmission impact assessment to be included in the Final Solar PEIS are provided in Section C.7.1 of this appendix. Analysis of transmission lines and/or access roads will be completed, as necessary, as part of the project-specific environmental reviews (see Section 2.2.2.2.2 of this Supplement).

Potential adverse impacts identified in the Draft Solar PEIS included the following:

- Access to U.S. Department of the Interior Bureau of Land Management (BLM), state, and private lands to the east and south of the SEZ could be affected by solar development if public access through the SEZ is not maintained. The current boundary of the SEZ would create an isolated parcel of public land that could be difficult to manage.

- The Cumbres & Toltec Area of Environmental Concern (ACEC) could be moderately affected by development within the SEZ, and there is potential that the scenic train ride experience could be diminished for some visitors. Wilderness characteristics within the San Antonio Wilderness Study Area (WSA) in New Mexico could be impaired. Potential impact on use of the Los Caminos Antiguos Scenic Byway is not known. The SEZ is located within the designated Sangre de Cristo National Heritage Area. The SEZ has the potential to adversely affect the West Fork of the North Branch of the Old Spanish Trail.

- Three seasonal grazing allotments would be cancelled and 575 animal unit months would be lost. Five grazing permittees would be displaced and would incur economic and possible social impacts.

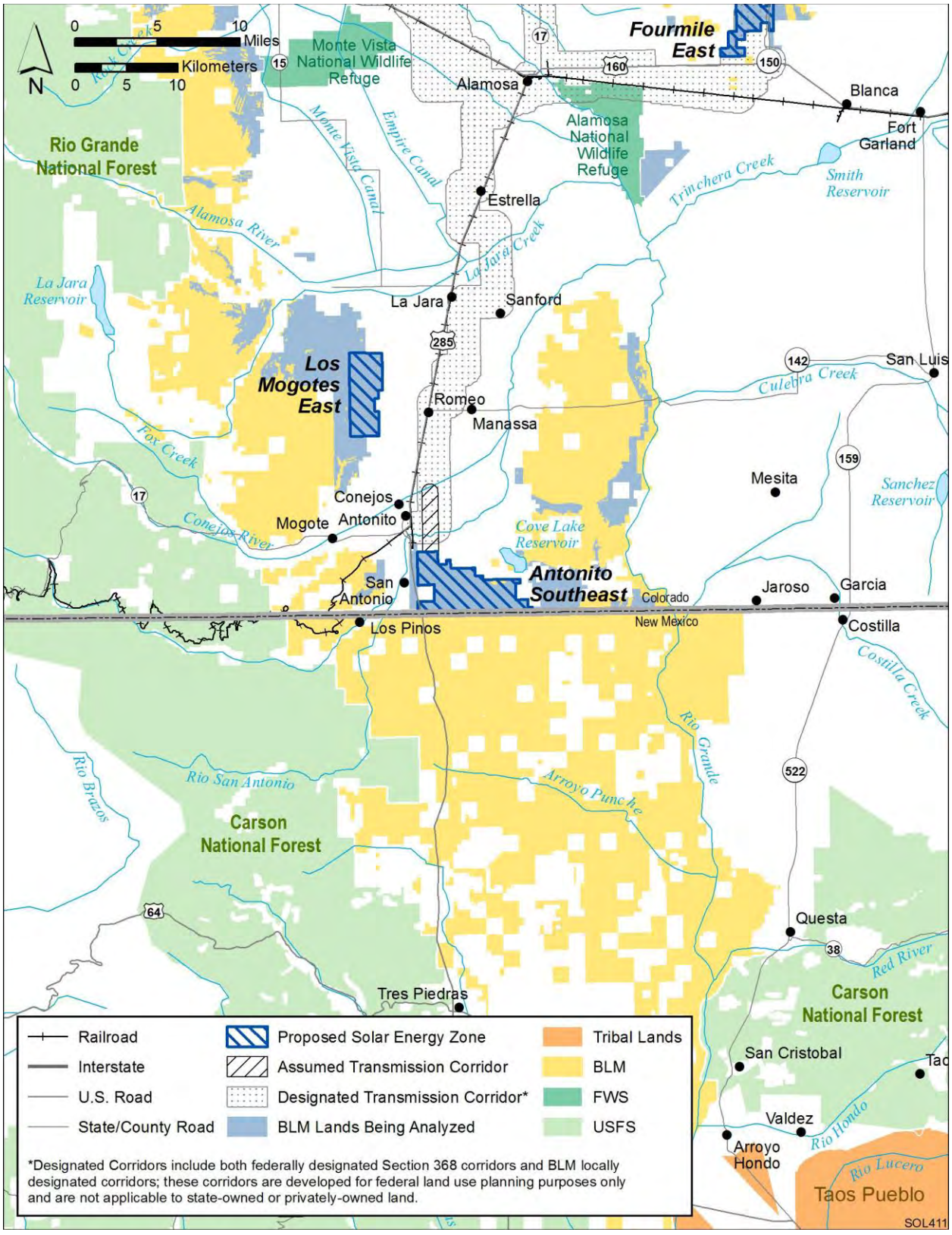


FIGURE C.3.1-1 Proposed Antonito Southeast SEZ as Presented in the Draft Solar PEIS

- The SEZ is located under two military training routes (MTRs) and any solar facility that impinges into military airspace would interfere with military training activities.

- Impacts on soil resources (e.g., soil compaction, soil horizon mixing, soil erosion by wind and runoff, sedimentation, and soil contamination) could occur.

- Groundwater use would deplete the aquifer to the extent that, at a minimum, wet-cooling options would not be feasible.

- Clearing of a large portion of the proposed SEZ could primarily affect semi-desert shrub steppe semi-desert grassland, and may adversely affect desert dry wash or wetland habitats, depending on the amount of habitat disturbed. The establishment of noxious weeds could result in habitat degradation.

- Potentially suitable habitat for 38 special status species and more than 50 wildlife species occurs in the affected area of the proposed SEZ; less than 1% of the potentially suitable habitat for any of these species occurs in the region that would be directly affected by development.

- If aquatic biota are present in ephemeral washes and Alta Lake and associated wetlands, they could be affected by the direct removal of surface water features within the construction footprint. Aquatic biota, if present in surface water features within the SEZ, could be indirectly affected by a decline in habitat quantity and quality because of water withdrawals and changes in drainage patterns, as well as increased sediment and contaminant inputs associated with ground disturbance and construction activities.

- Temporary exceedances of ambient air quality standards for particulate matter at the SEZ boundaries are possible during construction. These high concentrations, however, would be limited to the immediate area surrounding the SEZ boundary. Modeling indicates that emissions from construction activities could exceed Class I Prevention of Significant Deterioration (PSD) PM_{10} (particulate matter with an aerodynamic diameter of 10 μm or less) increments at the nearest federal Class I areas (Wheeler Peak Wilderness Area [WA] and Great Sand Dunes WA).

- Strong visual contrasts could be observed by visitors to the San Antonio WSA, the Los Caminos Antiguos Scenic Byway, and the Cumbres & Toltec Scenic Railroad depot in Antonito. Moderate visual contrasts could be observed from some locations by visitors to the San Luis Hills WSA and scenic ACEC, and the Cumbres & Toltec Scenic Railroad scenic ACEC. Because of these potential impacts, Visual Resource Management (VRM) Class II- and III-consistent mitigation measures were recommended for application to approximately the western half of the SEZ.

- During operations, noise levels at the nearest residences could be higher than the U.S. Environmental Protection Agency (EPA) guideline level if concentrating solar power facilities with energy storage technologies (which could extend the daily operational time by 6 hours or more) were used at the SEZ.

- Few impacts on significant paleontological resources are expected because these resources are not exposed and are not likely to occur within the SEZ. Direct impacts on significant cultural resources could occur. Further evaluation is needed to determine the effects of solar energy development on the West Fork of the North Branch of the Old Spanish Trail. Preliminary viewshed analyses indicate that the visual integrity of the Cumbres & Toltec Scenic Railroad Corridor ACEC and depot in the town of Antonito could be affected. It is possible that there will be Native American concerns about potential visual and noise effects of solar energy development in the SEZ on Blanca Peak. Effects on traditionally important plants and animals are also possible.

- Minority populations occur within a 50-mi (80-km) radius of the proposed SEZ boundary; thus adverse impacts of solar development could disproportionately affect minority populations.

C.3.1.2 Summary of Comments Received

Many of the comments received from environmental groups on the proposed Antonito Southeast SEZ were in favor of identifying the area as an SEZ (e.g., The Wilderness Society et al.[13]). Several members of the public commented that development of the SEZ would affect their ranching operations, while others were in support of the designating the area as an SEZ. Conejos County Clean Water, Inc., requested that representatives from the Town of Antonito, the Town of Romeo, and the Conejos County Board of Commissioners be added as cooperating agency officials for further National Environmental Policy Act of 1969 (NEPA) analysis for SEZs.

The EPA expressed concern with wetland protection in the Antonito Southeast SEZ, including Alta Lake, and suggested that the Final Solar PEIS include specific design criteria for wetland protection. The San Luis Valley Renewable Communities Alliance (SLVRCA) was concerned that the SEZ contains Colorado Department of Wildlife (CDOW)-identified elk severe winter range for pronghorn and recommended that activity should be limited outside of project fencing during severe winters when elk are using these areas.

[13] The Wilderness Society, Center for Native Ecosystems, Biodiversity Conservation Alliance, Rocky Mountain Recreation Initiative, Colorado Wild, Wild Connections, High Country Citizens' Alliance, Colorado Environmental Coalition, Audubon Colorado, Natural Resources Defense Council, Sierra Club, Soda Mountain Wilderness Council, and Sierra Trek submitted joint comments on the proposed Colorado SEZs. Those comments are attributed to The Wilderness Society et al.

The Wilderness Society et al. and SLVRCA were concerned that the SEZ contains a Gunnison prairie dog colony of unknown status and that surveys for the species have not been conducted. The Wilderness Society et al. also provided recommendations to avoid impacts on the Gunnison prairie dog, including avoidance of active colonies, clearance surveys within any area defined by CDOW as having colonies of inactive or unknown status, potential off-site mitigation within areas of high species viability, and project siting that avoids blocking migration corridors used by the species to migrate between colonies. The Conejos County Clean Water, Inc., group was concerned about the potential socioeconomic impact of solar energy development at the proposed Antonito Southeast SEZ.

C.3.1.3 Changes to the SEZ

No boundary revisions were identified for the proposed SEZ. However, areas specified for non-development under SEZ-specific design features were mapped, where data were available. For the proposed Antonito Southeast SEZ, 17 acres (0.07 km^2) of non-development wetland and lake areas were identified. (see Figure C.3.1-2). The remaining developable area within the SEZ is 9,712 acres (39.3 km^2).

To reduce the visual resource impacts of solar development within the proposed Antonito Southeast SEZ, SEZ-specific visual resource mitigation requirements have been developed. On the western side of the SEZ that was labeled to meet VRM Class II-consistent objectives in the Draft Solar PEIS, all forms of development will be limited to 10 ft (3.3 m) or under, and the technology will be restricted to either photovoltaic technologies of less than 10 ft (3.3 m), or technologies with comparable or lower height and reflectivity. Within the area of the SEZ that was labeled to meet VRM Class III-consistent objectives in the Draft Solar PEIS, the solar development will be restricted to either PV technologies of less than 10 ft (3.3 m) or technologies with comparable or lower height and reflectivity. Additional required mitigation measures to address potential visual resource impacts are given in Section C.7.3 of this appendix.

C.3.1.4 Wilderness Character Status of SEZ

A recently maintained inventory of wilderness characteristics was used to determine whether public lands within the Antonito Southeast SEZ have wilderness characteristics. The finding of this inventory was that these lands do not contain wilderness characteristics.

C.3.1.5 Additional Data Collection Recommended

C.3.1.5.1 Lands and Realty

None.

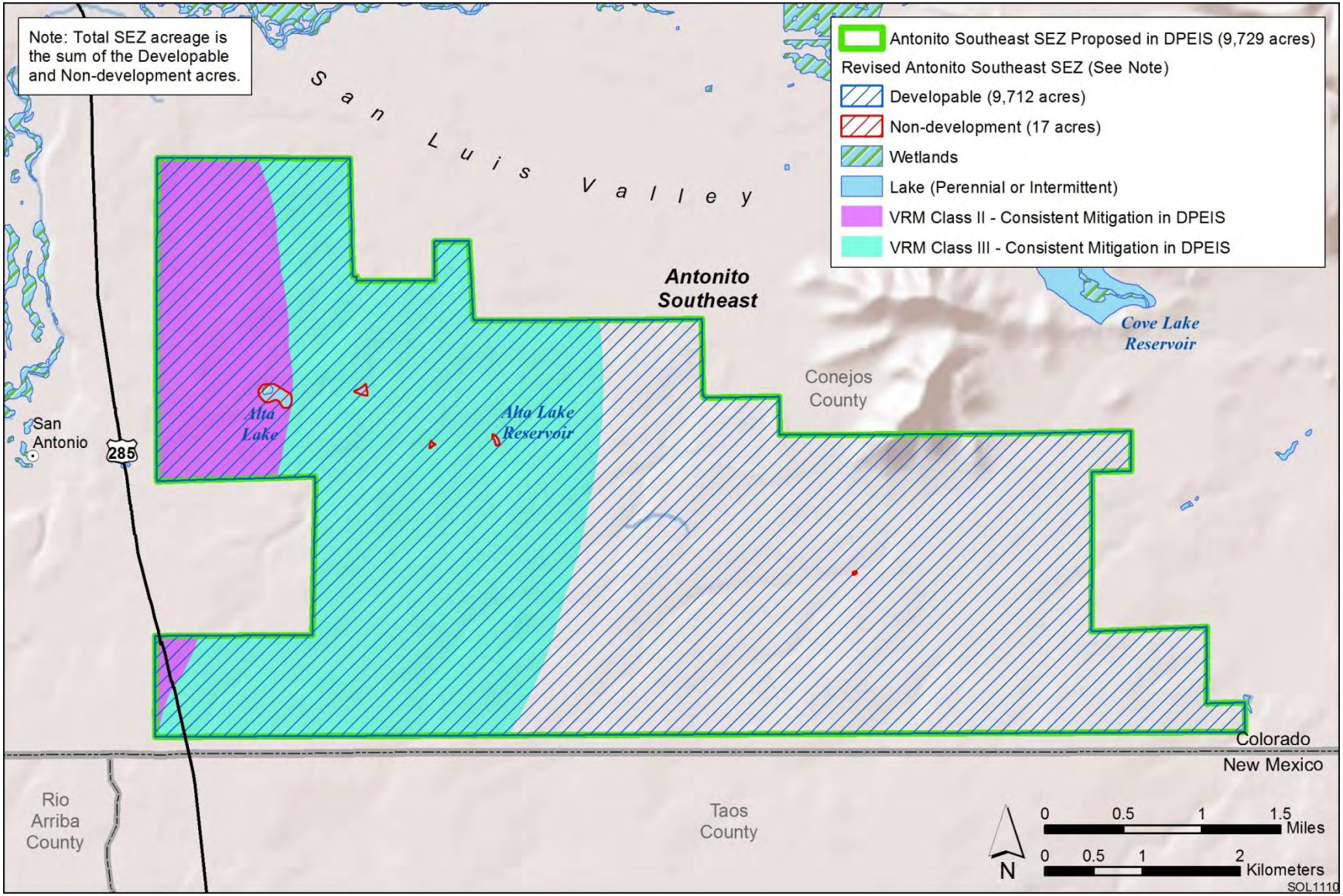


FIGURE C.3.1-2 Proposed Antonito Southeast SEZ as Described in this Supplement

C.3.1.5.2 Specially Designated Areas and Lands with Wilderness Characteristics

None.

C.3.1.5.3 Rangeland Resources

Livestock Grazing. None.

Wild Horses and Burros. None.

C.3.1.5.4 Recreation

Additional information on the potential impacts on hunting for big game species would help further characterize impacts on recreation. In addition, the San Luis Valley-wide effort to promote recreational use could warrant additional consideration. The status of off-highway vehicle use designation in the area may also warrant additional consideration.

C.3.1.5.5 Military and Civilian Aviation

The BLM will continue to consult with the U.S. Department of Defense (DoD) regarding potential issues with MTRs.

C.3.1.5.6 Geologic Setting and Soil Resources

None.

C.3.1.5.7 Minerals

Additional information on leasable and strategic minerals in the vicinity of the proposed SEZ will be provided in the Final Solar PEIS to inform the Department of the Interior's decision on a proposed 20-year withdrawal of SEZ lands.

C.3.1.5.8 Water Resources

The following additional data and actions would help further characterize potential impacts on water resources for the proposed Antonito Southeast SEZ. A more detailed discussion of each of these activities is included in the water resources action plan provided in Section C.7.2 of this appendix.

- Prepare a planning-level water resources inventory of the San Luis Valley (southern portion).

- Identify additional ephemeral stream channels and wetland features for non-development areas through consultation with Colorado Division of Water Resources (CDWR) (Division 3), CDOW, EPA, and U.S. Army Corps of Engineers (USACE) with a focus on:
  - Taos Valley Canal and its tributaries (western half of SEZ),
  - Unnamed tributaries to Cove Lake Reservoir (western half of SEZ), and
  - Ephemeral channels flowing southwest to northeast on the eastern half of the SEZ.

- Conduct a field survey to:
  - Survey Taos Valley Canal and ephemeral channels for surface elevations, high water marks, and sediment conditions, and
  - Conduct hydrologic rainfall-runoff-routing analyses to identify 100-year floodplain areas.

- Coordinate with the USACE (Albuquerque District) regarding jurisdictional water determinations for the SEZ. Water features to be considered include:
  - Taos Valley Canal and its tributaries (western half of SEZ),
  - Unnamed tributaries to Cove Lake Reservoir (western half of SEZ), and
  - Ephemeral channels flowing southwest to northeast on eastern half of SEZ.

- Identify 100-year floodplain exclusion areas for the SEZ. This task would require coordination with the Federal Emergency Management Agency and the Colorado Water Conservation Board.

- Describe the formation of a stakeholder committee to conduct long-term monitoring of water resources. This activity would entail:
  - Identifying key stakeholder agencies,
  - Discussing general features of a monitoring program, and
  - Working with the U.S. Geological Survey and the CDWR (Division 3) to develop groundwater monitoring well design and numerical groundwater models. (Groundwater monitoring should coordinate with the Rio Grande Decision Support System through the CDWR [Division 3].)

C.3.1.5.9 Ecological Resources

Vegetation and Plant Communities. The following additional data-gathering action would help further characterize potential impacts on vegetation and plant communities for the proposed Antonito Southeast SEZ:

- Identify and map the location and areal extent of dry wash and wetland communities within the SEZ. Identify and map the location and areal extent of these habitats, as well as riparian and greasewood flats habitats, outside the SEZ that may be affected by hydrologic changes, including groundwater elevations, and changes in water, sediment, and contaminant inputs associated with runoff.. Such effort could help determine habitat characteristics, including water source, hydrologic regime, and dominant plant species.

Wildlife. The following additional data-gathering actions would help further characterize potential impacts on wildlife resources for the SEZ:

- Conduct pre-disturbance surveys within the SEZ to determine the use of the SEZ as a movement/migratory corridor or as important habitat for elk and pronghorn.

Aquatic Biota. Investigations recommended under the water resources action plan (Section C.3.1.5.8) would be useful in characterizing and protecting habitat available to aquatic biota. Alta Lake likely contains aquatic biota and has been designated a non-development area. Therefore, a preliminary survey of Alta Lake is not necessary. However, if it is determined that Alta Lake could be affected indirectly by water withdrawals, changes in drainage patterns, and construction activities, the potential for aquatic communities to be affected in these areas could require further investigation prior to development. Ephemeral streams and wetlands within the SEZ are typically dry and contain water only for brief periods. They may or may not contain aquatic biota; therefore, preliminary evaluations of these surface water features could be conducted to determine the potential for aquatic communities to be present.

Special Status Species. The following additional data-gathering actions would be useful in further characterizing and protecting habitat available to special status species:

- Conduct pre-disturbance surveys within the SEZ to determine the presence and abundance of those special status species that are (1) federally listed, proposed for listing, or candidates for listing under the Endangered Species Act (ESA); or (2) listed by the State of Colorado as threatened or endangered; or (3) designated as sensitive by the Colorado BLM State Office. These species are listed in Table C.3.1-1. Surveys should focus on areas identified as potentially suitable, and the suitability of these habitats to support these special status species should be determined in the field. All field-determined suitable habitats for special status species should be mapped. Target species and survey protocols should be developed in coordination with the U.S. Fish and Wildlife Service (USFWS) and CDOW. The BLM is currently conducting surveys for various special status species (e.g., mountain plover, western burrowing owl, Gunnison prairie dog) within the State of Colorado. In areas where these surveys overlap with the Colorado SEZs and areas of direct

TABLE C.3.1-1 Special Status Species That May Occur in the Vicinity of the Proposed Antonito Southeast SEZ[a]

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Plants			
Brandegee's milkvetch	*Astragalus brandegeei*	BLM-S	Sandy or gravelly banks, flats, and stony meadows within pinyon-juniper woodlands. Substrates are usually sandstone with granite or occasional basalt. Elevation ranges between 5,400 and 8,800 ft.[d] Nearest occurrences are approximately 10 mi[e] west of the SEZ. About 1,628,700 acres[f] of potentially suitable habitat occurs within the analysis area.
Ripley's milkvetch[g]	***Astragalus ripleyi***	BLM-S	Mixed conifer woodlands on rocky volcanic substrates at elevations above 8,000 ft. Known to occur approximately 5 mi west of the SEZ. About 1,819,100 acres of potentially suitable habitat occurs within the analysis area.
Fish			
Rio Grande chub	***Gila pandora***	BLM-S	Clear, cool, fast-flowing water over rubble or gravel substrates. Quad-level occurrences intersect the affected area north of the SEZ. The nearest potentially suitable habitat is located in the Rio San Antonio, approximately 1 mi north (downgradient) of the SEZ. Approximately 29.3 mi of potentially suitable habitat in the Rio San Antonio, Rio de los Pinos, and the Conejos River occurs within the area of indirect effects.
Rio Grande sucker	*Catostomus plebeius*	CO-E	Restricted to streams of the Rio Grande Basin in channels and backwaters near rapidly flowing waters. Nearest potentially suitable habitat is located in the Rio San Antonio, approximately 1 mi north (downgradient) of the SEZ. Approximately 29.3 mi of potential habitat in the Rio San Antonio, Rio de los Pinos, and the Conejos River occurs within the area of indirect effects.
Reptiles			
Milk snake	*Lampropeltis triangulum*	BLM-S	Shortgrass prairie, sandhills, shrubby hillsides, pinyon-juniper woodlands, and arid river valleys at elevations below 8,000 ft. The species is known to occur in Conejos County, Colorado. About 42,000 acres of potentially suitable habitat occurs in the affected area.
Birds			
American peregrine falcon	*Falco peregrinus anatum*	BLM-S	Year-round resident in the SEZ region. Open spaces associated with high, near vertical cliffs and bluffs above 200 ft in height overlooking rivers. Nearest occurrences are from the Rio Grande National Forest approximately 20 mi west of the SEZ. About 3,747,350 acres of potentially suitable habitat occurs within the analysis area.
Bald eagle	*Haliaeetus leucocephalus*	CO-T	Year-round resident in the SEZ region. Seldom seen far from water, especially larger rivers, lakes, and reservoirs. Occurs locally in semiarid shrubland habitats where there is an abundance of small mammal prey. Known to occur in riparian habitats along the Rio Grande as near as 7 mi east of the Antonito Southeast SEZ. About 96,000 acres of potentially suitable habitat occurs in the affected area.
Barrow's goldeneye	*Bucephala islandica*	BLM-S	Winter resident in the SEZ region on larger lakes and rivers. Known to occur in the San Luis Valley. About 150,000 acres of potentially suitable habitat occurs in the affected area.

TABLE C.3.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Birds (Cont.)			
Ferruginous hawk	*Buteo regalis*	BLM-S	Summer resident in the affected area, but year-round resident in the SEZ region. Grasslands, sagebrush, and saltbrush habitats, as well as the periphery of pinyon-juniper woodlands throughout the project area. Nests in tall trees or on rock outcrops along cliff faces. Known to occur approximately 10 mi east of the Antonito Southeast SEZ. About 28,000 acres of potentially suitable habitat occurs in the affected area.
Mountain plover	***Charadrius montanus***	BLM-S	Summer resident in the SEZ region. Prairie grasslands and arid plains and fields. Nests in shortgrass prairies associated with prairie dogs, bison, and cattle. More than 50% of the global population nests in the states of Colorado and New Mexico. Known to occur about 5 mi east of the Antonito Southeast SEZ. About 100,000 acres of potentially suitable habitat occurs in the affected area.
Southwestern willow flycatcher	*Empidonax traillii extimus*	ESA-E; CO-E	Nests in thickets, scrubby and brushy areas, open second growth, swamps, and open woodlands in the Alamosa National Wildlife Refuge along the Rio Grande, approximately 25 mi northeast of the SEZ. About 4,400 acres of potentially suitable habitat occurs in the affected area.
Western burrowing owl	*Athene cunicularia hypugaea*	BLM-S; CO-T	Open grasslands and prairies, as well as disturbed sites such as golf courses, cemeteries, and airports throughout the SEZ region. Nests in burrows constructed by mammals (prairie dog, badger, etc.). Known to occur in Conejos County, Colorado. About 1,984,700 acres of potentially suitable habitat occurs in the SEZ region.
Mammals			
Gunnison's prairie dog	***Cynomys gunnisoni***	ESA-C	Mountain valleys, plateaus, and open brush habitats in the project area at elevations between 1,000 and 12,000 ft. Known to occur in the SEZ affected area in Colorado and northern New Mexico. About 83,000 acres of potentially suitable habitat occurs in the affected area.

[a] The listings for (1) federally listed, proposed for listing, or candidates for listing under the ESA, and (2) Colorado BLM State Office sensitive species have been updated since the release of the Draft Solar PEIS.

[b] BLM-S = listed as a sensitive species by the BLM; CO-E = listed as endangered by the State of Colorado; CO-T = listed as threatened by the State of Colorado; ESA-C = candidate for listing under the ESA; ESA-E = listed as endangered under the ESA.

[c] For plant species, potentially suitable habitat was determined by using Southwest Regional Gap Analysis Project (SWReGAP) land cover types (USGS 2005). For terrestrial vertebrate species, potentially suitable habitat was determined by using SWReGAP habitat suitability and land cover models. Area of potentially suitable habitat for each species is presented for the SEZ region, which is defined as the area within 50 mi (80 km) of the SEZ center.

[d] To convert ft to m, multiply by 0.3048.

[e] To convert mi to km, multiply by 1.609.

[f] To convert acres to km^2, multiply by 0.004047.

[g] Species in bold text have been recorded or have designated critical habitat in the affected area.

effects, the BLM survey information will be used to make appropriate determinations regarding the potential occurrence of species and their habitats. Additional survey efforts may be necessary, as appropriate.

The Draft Solar PEIS presents a table of special status species for which potential impacts need to be evaluated prior to development in the proposed Antonito Southeast SEZ. The list of species presented in Table 10.1.12.1-1 of the Draft Solar PEIS also includes species listed by the states of Colorado or New Mexico and species ranked by the States of Colorado or New Mexico as S1 or S2 or species of concern. Based on the design features presented in the Draft Solar PEIS, the potential for impacts on these additional species will also need to be addressed before development could occur in the SEZ.

- Identify and map the location and areal extent of grassland habitat within the SEZ. The suitability of this habitat for special status species should be determined. Species potentially associated with grassland habitat include the milk snake, mountain plover, and western burrowing owl.

- Identify and map the location and areal extent of aquatic, wetland, and riparian habitats within the SEZ. The suitability of these habitats for special status species should be determined. Species potentially associated with these habitats include the Rio Grande chub, Rio Grande sucker, milk snake, bald eagle, Barrow's goldeneye, ferruginous hawk, and southwestern willow flycatcher.

- Identify and map the location and areal extent of woodland habitats within the SEZ. The suitability of these habitats for special status species should be determined. Species potentially associated with woodland habitats include the Brandegee's milkvetch, Ripley's milkvetch, milk snake, and ferruginous hawk.

- Identify and map the location and areal extent of active Gunnison prairie dog colonies within the SEZ. Associated burrows also could be used by western burrowing owls.

C.3.1.5.10 Air Quality and Climate

None.

C.3.1.5.11 Visual Resources

Visual resources will be revaluated for the Final Solar PEIS based on the proposed technology restrictions described in Section C.3.1.3 of this Supplement. A summary of the Draft Solar PEIS visual contrast analysis for the proposed Antonito Southeast SEZ is provided in

Table C.3.1-2. This table includes only the resources that would be subject to moderate or strong visual contrast. The Draft Solar PEIS visual impact analysis predicted these levels of visual contrast from solar energy development in the Antonito Southeast SEZ for the following sensitive visual resource areas (SVRAs) and sensitive viewing locations (SVLs):

- San Antonio WSA
- San Luis Hills WSA
- Los Caminos Antiguos Scenic Highway
- Cumbres & Toltec Railroad Corridor ACEC
- San Luis Hills ACEC
- Antonito
- West Fork of the North Branch of the Old Spanish Trail.

The following steps could be taken to better understand potential impacts on these SVRAs and SVLs from solar development in the Antonito Southeast SEZ:

- Identify key observation points (KOPs) within these areas through working with the management agency or other local stakeholders.
- Conduct viewshed analyses from the KOPs to determine how much of the SEZ would be in view from each KOP.
- As deemed necessary, based on viewshed analysis results, prepare wireframe Google Earth™ visualizations of hypothetical solar facilities in the SEZ depicting the 80% development scenario to better estimate potential impacts.

This additional analysis may help judge potential visual contrast more accurately for most KOPs. For KOPs of particularly high sensitivity, a site visit with photography and superimposition of the wireframe models onto the photos might be required or desired.

Additional required mitigation measures to address potential visual resource impacts are given in Section C.7.3 of this appendix.

C.3.1.5.12 Acoustic Environment

None.

TABLE C.3.1-2 Summary of Potential Visual Impacts on SVRAs and SVLs within the 25-mi (40-km) Viewshed of the Proposed Antonito Southeast SEZ

Management Area Category	SVRA/SVL within 25 mi[a] of SEZ	Total Acreage/ Mileage[a,b,c] of SVRA/SVL	Distance from SEZ at Point of Closest Approach[d]	Total Acreage/Mileage Visible within 25 mi[e]	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes[f]
WSAs	San Antonio	7,321 acres	1.5 mi southwest of the SEZ	6,920 acres	94.5	Visual contrast would be highly dependent on viewer location and project location and characteristics. Solar energy development would be expected to create weak to strong visual contrasts as viewed from the WSA; roughly half of the WSA is within 3 to 5 mi of the SEZ.
	San Luis Hills	10,896 acres	6 mi northeast of the SEZ	5,258 acres	48.3	Visual contrast would be dependent on viewer and project locations and the projects' characteristics. Solar energy development would be expected to create weak to moderate visual contrasts. Contrast levels would be highest at high-elevation viewpoints in the southwestern part of the WSA, and lower for low-elevation viewpoints, such as in canyons or on bajadas. Visible areas extend from approximately 6 mi from the northern boundary of the SEZ to approximately 9 mi from the SEZ.
Scenic Highways	Los Caminos Antiguos[g]	129 mi	2 mi northwest of the northwest corner of the SEZ	38 mi	29.5	Range of contrast would be highly dependent on viewer and project locations and design. Solar facilities could attract attention but are not likely to dominate views from the byway. Solar energy development would be expected to create weak to strong visual contrasts.

TABLE C.3.1-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi[a] of SEZ	Total Acreage/ Mileage[a,b,c] of SVRA/SVL	Distance from SEZ at Point of Closest Approach[d]	Total Acreage/Mileage Visible within 25 mi[e]	Percent Total Acreage/ Mileage Visible within 25 mi	Notes[f]
ACECs designated for Outstanding Scenic Values	Cumbres &Toltec Railroad Corridor	3,868 acres	1.5 mi north-northwest of the SEZ	3,219 acres	83.2	Moderate visual contrasts from solar energy development at some points on the railroad would be expected. In some locations, development might create strong contrasts in form, line, color, and texture, especially if viewed against a sky backdrop. A detailed future site-specific NEPA analysis would be required to determine visibility and potential impacts precisely.
	San Luis Hills	39,421 acres	5 mi north-northeast of the SEZ	12,516 acres	31.7	Range of visual contrasts would depend on viewer and solar facility locations, as well the projects' characteristics. Solar facilities could attract attention but would not likely dominate the view and would be expected to create weak to moderate visual contrasts. Contrast levels would be highest at high-elevation viewpoints in the southern part of the ACEC, and lower for low-elevation viewpoints or high-elevation viewpoints in the northern portion of the ACEC.

TABLE C.3.1-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi[a] of SEZ	Total Acreage/ Mileage[a,b,c] of SVRA/SVL	Distance from SEZ at Point of Closest Approach[d]	Total Acreage/Mileage Visible within 25 mi[e]	Percent Total Acreage/ Mileage Visible within 25 mi	Notes[f]
Other Areas of Interest (non-management areas)	Antonito[h]	250 acres	1.5 mi north-northwest of the SEZ	NA[i]	NA	Where clear views to the SEZ exist, residents and visitors could observe strong visual contrasts. Locations farther north generally would be subject to lower visual contrast due to the increased distance, but also because of the more extensive screening of views of the SEZ by vegetation and buildings within the community. A detailed future site-specific NEPA analysis is required to determine visibility.
	West Fork of the North Branch of the Old Spanish Trail[j]	2,700 mi	Passes within approximately 0.1 mi of the SEZ	NA	NA	Trail users would be expected to observe strong visual contrasts from solar energy development at some points on the trail. The SEZ would be visible from many points along the trail starting approximately 9 mi south of the SEZ to beyond 25 mi north of the SEZ.

[a] To convert mi to km, multiply by 1.609.

[b] To convert acres to km^2, multiply by 0.004047.

[c] Mileage (within all columns) is used only for trails or roads, unless otherwise specified.

[d] Distances at the point of closest approach are based on the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries would result in changes to these calculations.

[e] The total acreage/mileage visible within 25 mi (40 km) of the SEZ is based on the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries would result in changes to these acreages/mileages, as well as the percentage of total acreages/mileages visible within 25 mi (40 km) of the SEZ.

Footnotes continued on next page.

TABLE C.3.1-2 (Cont.)

[f] The assessment of impacts is based on the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries may result in reduced impacts in some of the SVRAs and SVLs due to the reduction in the overall footprint of the SEZ.

[g] Length of byway: America's Byways (2011a).

[h] Acreage of Colorado towns: U.S. Bureau of the Census (2011a).

[i] NA = data not available.

[j] Length of trail: BLM (2011a).

C.3.1.5.13 Paleontological Resources

The potential for impacts on paleontological resources within the proposed Antonito Southeast SEZ is low. Most of the SEZ has a Potential Fossil Yield Classification (PFYC) of Class 1 as noted in the Draft Solar PEIS. Only about 4 acres (0.016 km^2) is currently classified as Class 4/5 in an area in the northern part of the SEZ. Prior to development, the depth of the potentially paleontologically significant Alamosa Formation would need to be determined in that small area, and the remainder of the SEZ should be field checked to verify the PFYC classification of Class 1.

The BLM Regional Paleontologist will be contacted to determine whether additional information is available regarding the paleontological potential of the SEZ.

C.3.1.5.14 Cultural Resources and Native American Concerns

None of the proposed Antonito Southeast SEZ has been systematically surveyed, and consequently no sites have been recorded within the original footprint of the SEZ. About 80 sites (including isolated finds) have been recorded within 5 mi (8 km) of the SEZ. Paleoindian sites could be encountered throughout the San Luis Valley. Several linear features have been noted in the Draft Solar PEIS as being within the SEZ, and, more recently some of these features were spotted on light detection and ranging (LIDAR) imagery. These features may be associated with former railroads, irrigation features, and general trail routes. The West Fork of the North Branch of the Old Spanish Trail is a culturally significant trail that proceeds close to the western boundary of the SEZ. Visual and auditory impacts are possible on the trail and also on Blanca Peak, a sacred mountain to the Navajo northeast of the SEZ. Impacts on the visual integrity of the Cumbres and Toltec Scenic Railroad are also possible. The destruction and degradation of important plant resources and the destruction of habitat or impediments to the movement of culturally important wildlife are also potential impacts of concern within the SEZ.

The following additional data collection efforts could reduce the uncertainty about potential impacts on cultural resources:

- Conduct a Class I literature file search to better understand (1) the site distribution pattern in the vicinity of the SEZ; (2) trail networks through existing ethnographic reports; and 3) overall cultural sensitivity of the landscape.

- Conduct a Class II Stratified Random Sample Survey of the SEZ to obtain a 10% sample (roughly 971 acres [3.9 km^2]). Areas of interest, as determined through a Class I review, should also be identified prior to establishing the survey design and sampling strategy. A Class III inventory of linear features detected using LIDAR in the Antonito SEZ is currently under way and will account for a portion of the recommended sample.

- Prepare a cultural sensitivity map based on results of the Class II survey, the Class I review, and the Class III inventory of linear features.

- Identify the integrity and historical significance of the portion of the West Fork of the North Branch of the Old Spanish Trail in the vicinity of the SEZ, and conduct viewshed analyses from key points along the trail. If this portion of the trail is determined significant, a mitigation strategy would need to be developed to address unavoidable impacts on the trail.

- Continue with government-to-government consultation as described in Section 2.4.3., including follow-up to recent ethnographic studies covering some SEZs in Nevada and Utah with Tribes not included in the original studies to determine whether those Tribes have similar concerns. The Antonito Southeast SEZ was used by Tribes historically for hunting and trading rather than long-term settlement. The Ute, Jicarilla Apache, Navajo, Kiowa, Comanche, Arapaho, Pueblo groups, and Cheyenne may all have traditional interests in the valley. Potentially significant sites and landscapes for the Navajo, Upper Rio Grande Pueblo (Tewa), and Taos Pueblo are present in the San Luis Valley (Blanca Peak, Great Sand Dunes, San Luis Lakes). Potential topics to be discussed during consultation include the above-mentioned places, trail systems, mountain springs and other water sources, mineral resources, burial sites, ceremonial areas, and plant and animal resources. An ethnographic study of the SEZs in the San Luis Valley is currently proposed; results of the study will be incorporated into the Final Solar PEIS, if available at the time of publication.

C.3.1.5.15 Socioeconomics and Environmental Justice

None.

C.3.1.5.16 Cumulative Impact Considerations

None.

C.3.2 De Tilla Gulch

C.3.2.1 Summary of Potential Impacts Identified in the Draft Solar Programmatic Environmental Impact Statement (PEIS)

The proposed De Tilla Gulch solar energy zone (SEZ), as presented in the Draft Solar PEIS, had a total area of 1,522 acres (6.2 km^2). It is located in Saguache County in south-central Colorado (Figure C.3.2-1). The towns of Lund and Zane are about 4 mi (6 km) north of, and 5 mi (8 km) west of, the SEZ, respectively. The town of Saguache is located about 8 mi (12 km) west of the SEZ, and the larger town of Alamosa is located about 50 mi (80 km) to the south.

A U.S. Department of the Interior Bureau of Land Management (BLM)-designated transmission corridor covers about two-thirds of the SEZ and could limit development in the SEZ because solar facilities cannot be constructed under transmission lines. The discussion of impacts of solar energy development in the SEZ in the Draft Solar PEIS acknowledged that the presence of the corridor would reduce the amount of land available for solar power production, and that, conversely, full development of solar facilities within the SEZ would limit use of the transmission corridor.

The Draft Solar PEIS identified a 115-kV transmission line adjacent to the proposed De Tilla Gulch SEZ as the nearest point for connection of the SEZ to the grid. The actual location of connection to the transmission grid could be different than that assumed in the Draft Solar PEIS. Details on a revised transmission impact assessment for the SEZs to be included in the Final Solar PEIS are provided in Section C.7.1 of this appendix. Analysis of transmission lines and/or access roads will be completed, as necessary, as part of the project-specific environmental reviews (see Section 2.2.2.2.2 of this Supplement).

Potential adverse impacts identified in the Draft Solar PEIS included the following:

- Development of the site could further fragment the public land in the area and could make the remaining lands more difficult to manage. Non-mitigable impacts on private and state lands related to changes in existing land uses may occur.

- The historic setting of the designated Old Spanish National Historic Trail and future management of the trail would be adversely affected.

- The SEZ is located in an area under a military training route (MTR) and is identified as being a consultation area for the U.S. Department of Defense (DoD). Development of any solar or transmission facilities that impinge into airspace used by the military would be of concern to the military and could interfere with military training activities.

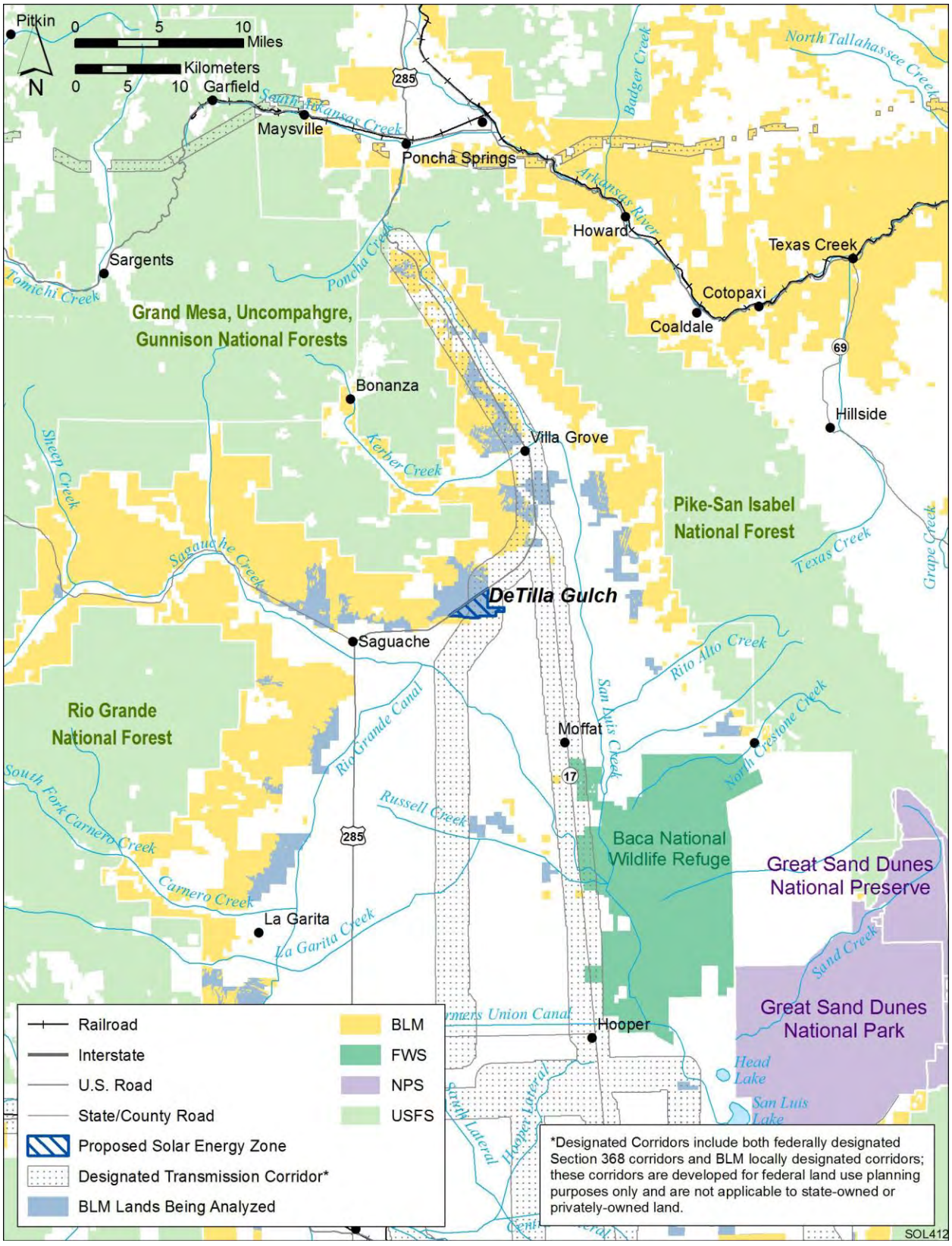


FIGURE C.3.2-1 Proposed De Tilla Gulch SEZ as Presented in the Draft Solar PEIS

- Impacts on soil resources (e.g., soil compaction, soil horizon mixing, soil erosion by wind and runoff, sedimentation, and soil contamination) could occur.

- Clearing of a large portion of the proposed SEZ could primarily affect semidesert shrub steppe and may adversely affect desert dry wash and greasewood flats habitats, depending on the amount of habitat disturbed. The establishment of noxious weeds could result in habitat degradation. Deposition of fugitive dust could cause reduced productivity or changes in plant community structure.

- Potentially suitable habitat for 13 special status species and more than 50 wildlife species occurs in the affected area of the proposed SEZ; less than 1.0% of the potentially suitable habitat for any of these species occurs in the region that would be directly affected by development.

- If aquatic biota exist within the small ephemeral washes, they could be affected by the direct removal of these surface water features within the construction footprint, a decline in habitat quantity and quality due to water withdrawals and changes in drainage patterns, as well as increased sediment and contaminant inputs associated with ground disturbance and construction activities.

- Temporary exceedances of ambient air quality standards for particulate matter at the SEZ boundaries are possible during construction. These high concentrations, however, would be limited to the immediate area surrounding the SEZ boundary. Modeling indicates that emissions from construction activities could exceed Class I Prevention of Significant Deterioration (PSD) PM_{10} (particulate matter with an aerodynamic diameter of 10 μm or less) increments at the nearest Class I area (the Great Sand Dunes Wilderness Area), but the potential impacts would be moderate and temporary.

- Strong visual contrasts could be observed by visitors along the Old Spanish National Historic Trail and travelers on U.S. 285. Weak to moderate visual contrasts could be observed from the northern portions of the Baca National Wildlife Refuge (NWR), and weak visual contrast would be observed by residents of Moffat. Because of these potential impacts, it was recommended that development of power tower facilities be prohibited within the SEZ.

- During operations, noise levels at the nearest residences could be higher than the U.S. Environmental Protection Agency (EPA) guideline level if concentrating solar power facilities with energy storage technologies (which could extend the daily operational time by 6 hours or more) were used at the SEZ.

- Impacts on significant paleontological and cultural resources are unknown. Further investigation is needed to determine the possibility of the Old Spanish National Historic Trail crossing through a portion of the SEZ. It is possible that there will be Native American concerns about potential visual and noise effects of solar energy development in the SEZ on culturally significant locations within the valley.

C.3.2.2 Summary of Comments Received

Many of the comments received on the proposed De Tilla Gulch SEZ were in favor of identifying the area as an SEZ with proper siting, design, and mitigation (The Wilderness Society et al.[14] and others).

The residents of Saguache, Colorado, commented that they expect to be involved in any solar energy development that takes place on the SEZ. The Wilderness Society et al. proposed adjusting the boundary to remove the active prairie dog colony that overlaps the northern edge of the SEZ. Also, if surveys performed within the intersection area of the SEZ and Mineral Hot Springs Potential Conservation Area (PCA) indicate that there is significant activity by special status species within the SEZ, boundary adjustments should be considered to eliminate the PCA. Because the SEZ contains Colorado Division of Wildlife (CDOW)-identified severe winter range for elk and winter concentration habitat for pronghorn, The Wilderness Society et al. recommended that disturbance during the winter season be avoided or minimized in these areas. The CDOW recommends that the BLM and U.S. Department of Energy consider re-evaluating the magnitude of impacts of habitat loss within each SEZ for individual species or groups of species.

The Cultural Resources Preservation Coalition recommended the removal of the De Tilla Gulch SEZ because of potential impacts on the Old Spanish National Historic Trail. If the area is retained as an SEZ, the coalition suggested that solar development should be restricted to areas that do not have the potential to adversely affect the setting of the trail, and a combination of mitigation measures should be required to minimize impacts on high-potential route segments located within the SEZ viewshed.

The EPA suggested that if wet cooling is considered as an option for the De Tilla Gulch SEZ, the Final Solar PEIS should clearly identify the level of groundwater withdrawal that can be maintained without adversely affecting groundwater levels in the area. The CDOW recommended that SEZ-specific design features be adopted that require off-site habitat improvement projects and/or compensatory mitigation that offsets habitats losses in order to minimize displacement of big game and lost hunting opportunities for pronghorn.

[14] The Wilderness Society, Center for Native Ecosystems, Biodiversity Conservation Alliance, Rocky Mountain Recreation Initiative, Colorado Wild, Wild Connections, High Country Citizens' Alliance, Colorado Environmental Coalition, Audubon Colorado, Natural Resources Defense Council, Sierra Club, Soda Mountain Wilderness Council, and Sierra Trek submitted joint comments on the proposed Colorado SEZs. Those comments are attributed to The Wilderness Society et al.

C.3.2.3 Changes to the SEZ

The proposed De Tilla Gulch SEZ has been reconfigured to eliminate 458 acres (1.9 $km^{2)}$ along the northwest edge of the SEZ (i.e., the area that had bordered U.S. 285) (see Figure C.3.2-2). Excluding this area will avoid impacts on an active Gunnison prairie dog colony, on pronghorn winter range and winter concentration area, and on the proposed Cochetopa Scenic Byway. The remaining SEZ area is 1,064 acres (4.3 km^2). No additional areas for non-development were identified within the SEZ.

Because of the extensive potential impacts from solar development in the portion of the De Tilla Gulch SEZ that has been eliminated, those lands will be considered solar right-of-way exclusion areas; that is, applications for solar development on those lands will not be accepted by the BLM.

C.3.2.4 Wilderness Character Status of SEZ

A recently maintained inventory of wilderness characteristics was used to determine whether public lands within the De Tilla Gulch SEZ have wilderness characteristics. The finding of this inventory was that these lands do not contain wilderness characteristics.

C.3.2.5 Additional Data Collection Recommended

C.3.2.5.1 Lands and Realty

None.

C.3.2.5.2 Specially Designated Areas and Lands with Wilderness Characteristics

None.

C.3.2.5.3 Rangeland Resources

Livestock Grazing. The potential impact on the Crow grazing allotment will be re-evaluated based on the revised boundaries.

Wild Horses and Burros. None.

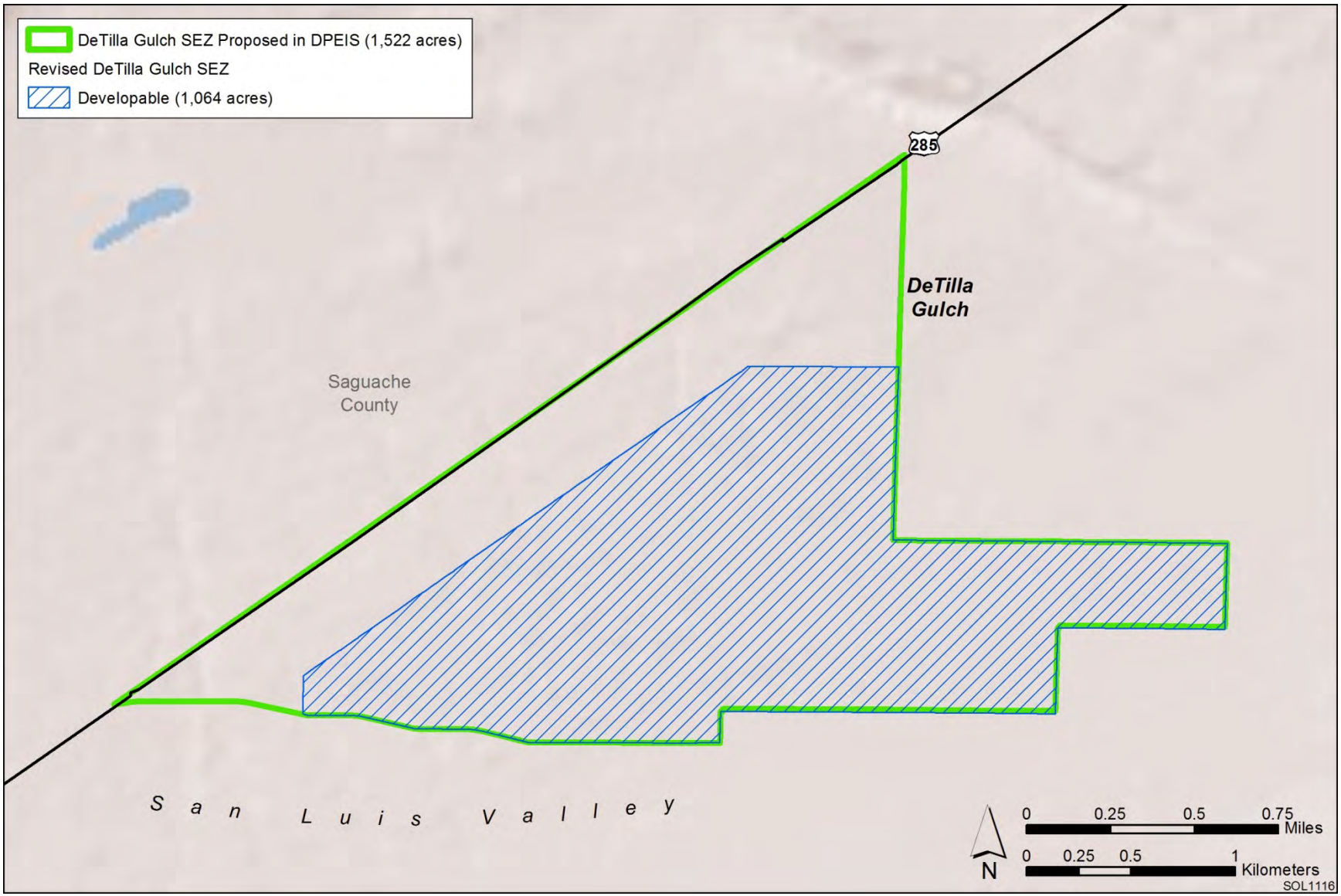


FIGURE C.3.2-2 Proposed De Tilla Gulch SEZ as Described in this Supplement

C.3.2.5.4 Recreation

Additional information on the potential impacts on hunting for big game species would help further characterize impacts on recreation. In addition, the San Luis Valley-wide effort to promote recreational use could warrant additional consideration. The status of off-highway vehicle use designation in the area may also warrant additional consideration.

C.3.2.5.5 Military and Civilian Aviation

None.

C.3.2.5.6 Geologic Setting and Soil Resources

None.

C.3.2.5.7 Minerals

Additional information on leasable and strategic minerals in the vicinity of the proposed SEZ will be provided in the Final Solar PEIS to inform the Department of the Interior's decision on a proposed 20-year withdrawal of SEZ lands.

C.3.2.5.8 Water Resources

The following additional data and actions would help further characterize potential impacts on water resources for the proposed De Tilla Gulch SEZ. A more detailed discussion of each of these activities is included in the water resources action plan provided in Section C.7.2 of this appendix.

- Prepare a planning-level water resources inventory of the San Luis Valley (northern portion).

- Identify additional ephemeral stream channels and wetland features for non-development areas through consultation with the Colorado Division of Water Resources (CDWR) (Division 3), CDOW, EPA, and U.S. Army Corps of Engineers (USACE) with a focus on:
  - Several ephemeral channels that cross the SEZ from northwest to southeast (including De Tilla Gulch and Schecker Gulch).

- Conduct a field survey to:
  - Survey the ephemeral channels for surface elevations, high water marks, and sediment conditions, and

  - Conduct hydrologic rainfall-runoff-routing analyses to identify 100-year floodplain areas.

- Coordinate with the USACE (Albuquerque District) regarding jurisdictional water determinations for the SEZ. Water features to be considered include:
  - Several ephemeral channels that cross the SEZ from northwest to southeast (including De Tilla Gulch and Schecker Gulch).

- Identify 100-year floodplain exclusion areas for the SEZ. This task would require coordination with the Federal Emergency Management Agency and the Colorado Water Conservation Board.

- Describe the formation of a stakeholder committee to conduct long-term monitoring of water resources. This activity would entail:
  - Identifying key stakeholder agencies;
  - Discussing general features of a monitoring program; and
  - Working with the U.S. Geological Survey and CDWR (Division 3) to develop groundwater monitoring well design and numerical groundwater models. (Groundwater monitoring should coordinate with the Rio Grande Decision Support System through the CDWR [Division 3].)

C.3.2.5.9 Ecological Resources

Vegetation and Plant Communities. The following additional data-gathering action would help further characterize potential impacts on vegetation and plant communities for the proposed De Tilla Gulch SEZ.

- Identify and map the location and areal extent of dry wash and greasewood flat communities within the SEZ. Identify and map the location and areal extent of these habitats, as well as wetland and riparian habitats, outside the SEZ that may be affected by hydrologic changes, including groundwater elevations, and changes in water, sediment, and contaminant inputs associated with runoff. Such efforts could help determine habitat characteristics, including water source, hydrologic regime, and dominant plant species.

Wildlife. The following additional data-gathering action would help further characterize potential impacts on wildlife resources for the SEZ.

- Conduct pre-disturbance surveys within the SEZ to determine the use of the SEZ as a movement/migratory corridor or as important habitat for the elk, mule deer, and pronghorn.

Aquatic Biota. Investigations recommended under the water resources action plan (Section C.3.2.5.8) would be useful in characterizing and protecting habitat available to aquatic biota. Most washes in the SEZ are typically dry and contain water only for brief periods. They may or may not contain aquatic biota; therefore, preliminary evaluations of these surface water features could be conducted to determine the potential for aquatic communities to be present. Any aquatic biota found in these features would likely be desiccation-adapted aquatic invertebrates typical of the region, and the primary value may be as food sources to nonaquatic animals.

Special Status Species. The following additional data-gathering actions would be useful in further characterizing and protecting habitat available to special status species.

- Conduct pre-disturbance surveys within the SEZ to determine the presence and abundance of those special status species that are (1) federally listed, proposed for listing, or candidates for listing under the Endangered Species Act (ESA); or (2) listed by the State of Colorado as threatened or endangered; or (3) designated as sensitive by the Colorado BLM State Office. These species are listed in Table C.3.2-1. Surveys should focus on areas identified as potentially suitable, and the suitability of these habitats to support these special status species should be determined in the field. All field-determined suitable habitats for special status species should be mapped. Target species and survey protocols should be developed in coordination with the U.S. Fish and Wildlife Service (USFWS) and CDOW. The BLM is currently conducting surveys for various special status species (e.g. mountain plover, western burrowing owl, Gunnison prairie dog) within the State of Colorado. In areas where these surveys overlap with the Colorado SEZs and areas of direct effects, the BLM survey information will be used to make appropriate determinations regarding the potential occurrence of species and their habitats. Additional survey efforts may be necessary, as appropriate.

  The Draft Solar PEIS presents a table of special status species for which potential impacts need to be evaluated prior to development in the proposed De Tilla Gulch SEZ. The list of species presented in Table 10.2.12.1-1 of the Draft Solar PEIS also includes species listed by the State of Colorado and species ranked by the State of Colorado as S1 or S2 or species of concern. On the basis of design features presented in the Draft Solar PEIS, the potential for impacts on these additional species will also need to be addressed before development could occur in the SEZ.

C.3.2.5.10 Air Quality and Climate

None.

TABLE C.3.2-1 Special Status Species That May Occur in the Vicinity of the Proposed De Tilla Gulch SEZ[a]

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Birds			
American peregrine falcon	*Falco peregrinus anatum*	BLM-S	Year-round resident in the SEZ region. Open spaces associated with high, near vertical cliffs and bluffs above 200 ft[d] in height overlooking rivers. Nearest occurrences are from the Rio Grande National Forest approximately 16 mi[e] southwest of the SEZ. Suitable foraging habitat for this species may occur within the affected area. About 3,375,750 acres[f] of potentially suitable habitat occurs in the SEZ region.
Bald eagle	*Haliaeetus leucocephalus*	CO-T	Year-round resident in the SEZ region. Seldom seen far from water, especially larger rivers, lakes, and reservoirs. Also occurs locally in semiarid shrubland habitats where there is an abundance of small mammal prey. Known from the San Luis Creek in the Baca NWR as near as 12 mi southeast (downgradient) of the SEZ. About 1,443,500 acres of potentially suitable habitat occurs in the SEZ region.
Ferruginous hawk	*Buteo regalis*	BLM-S	Summer resident in the SEZ region. Grasslands, sagebrush, and saltbush habitats, as well as the periphery of pinyon-juniper woodlands throughout the San Luis Valley. Known to occur in the Baca NWR about 30 mi southeast of the SEZ. About 950,500 acres of potentially suitable habitat occurs in the SEZ region.
Gunnison sage-grouse	*Centrocercus minimus*	ESA-UR; BLM-S	Year-round resident in the SEZ region. Primarily found in the Gunnison Basin in south-central Colorado, the species inhabits large expanses of sagebrush with mixed grasses and forbs. Populations have been observed as near as 10 mi north of the SEZ. About 657,100 acres of potentially suitable habitat occurs in the SEZ region.
Mountain plover	*Charadrius montanus*	BLM-S	Summer resident in the SEZ region. Prairie grasslands and arid plains and fields. Nests in shortgrass prairies associated with prairie dogs, bison, and cattle. Known to occur within 10 mi west (upgradient) of the SEZ. About 970,750 acres of potentially suitable habitat occurs in the SEZ region.
Western burrowing owl	*Athene cunicularia hypugaea*	BLM-S; CO-T	Open grasslands and prairies, as well as disturbed sites such as golf courses, cemeteries, and airports throughout the SEZ region. Nests in burrows constructed by mammals (prairie dog, badger, etc.). Known to occur in Saguache County, Colorado. About 1,135,500 acres of potentially suitable habitat occurs in the SEZ region.
Mammals			
Big free-tailed bat	*Nyctinomops macrotis*	BLM-S	Roosts in rock crevices on cliff faces or in buildings. Forages primarily in coniferous forests and arid shrublands to feed on moths. About 1,246,800 acres of potentially suitable habitat occurs in the SEZ region.

TABLE C.3.2-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Gunnison's prairie dog	*Cynomys gunnisoni*	ESA-C	Mountain valleys, plateaus, and open brush habitats in southwestern and south-central Colorado at elevations between 6,000 and 12,000 ft. Known to occur about 35 mi southwest of the SEZ. About 1,470,200 acres of potentially suitable habitat occurs in the SEZ region.

[a] The listings for (1) federally listed, proposed for listing, or candidates for listing under the ESA, and (2) Colorado BLM State Office sensitive species have been updated since the release of the Draft Solar PEIS.

[b] BLM-S = listed as a sensitive species by the BLM; CO-T = listed as threatened by the State of Colorado; ESA-C = candidate for listing under the ESA; ESA-E = listed as endangered under the ESA; ESA-UR = under review for listing under the ESA.

[c] For bird and mammal species, potentially suitable habitat was determined by using Southwest Regional Gap Analysis Project (SWReGAP) habitat suitability models (USGS 2005). Area of potentially suitable habitat for each species is presented for the SEZ region, which is defined as the area within 50 mi (80 km) of the SEZ center.

[d] To convert ft to m, multiply by 0.3048.

[e] To convert mi to km, multiply by 1.609.

[f] To convert acres to km^2, multiply by 0.004047.

C.3.2.5.11 Visual Resources

Visual resources will be revaluated for the Final Solar PEIS based on the revisions to boundaries described in Section C.4.3.3 of this Supplement. A summary of the Draft Solar PEIS visual contrast analysis for the proposed De Tilla Gulch SEZ is provided in Table C.3.2-2. This table includes only the resources that would be subject to moderate or strong levels of visual contrast. The Draft Solar PEIS visual impact analysis predicted these levels of visual contrast from solar energy development in the De Tilla Gulch SEZ for the following sensitive visual resource areas (SVRAs) and sensitive viewing locations (SVLs):

- Old Spanish National Historic Trail
- U.S. 285.

The following steps could be taken to better understand potential impacts on these SVRAs and SVLs from solar development in the De Tilla Gulch SEZ:

- Identify key observation points (KOPs) within these areas through working with the management agency or other local stakeholders.
- Conduct viewshed analyses from the KOPs to determine how much of the SEZ would be in view from each KOP.

TABLE C.3.2-2 Summary of Potential Visual Impacts on SVRAs and SVLs within the 25-mi (40-km) Viewshed of the Proposed De Tilla Gulch SEZ

Management Area Category	SVRA/SVL within 25 mi[a] of SEZ	Total Acreage/ Mileage[a,b,c] of SVRA/SVL	Distance from SEZ at Point of Closest Approach[d]	Total Acreage/Mileage Visible within 25 mi[e]	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes[f]
National Historic Trail	Old Spanish[g]	2,700 mi	Passes within 0.6 to 0.25 mi of the SEZ as it parallels the entire southern boundary of the SEZ	34.6 mi	1.3	Westbound trail users would have extended views of solar facilities as they crossed the lower slopes of the Sangre de Cristo Mountains, then turned west to cross the San Luis Valley, and approached the SEZ directly. Visual contrast levels from solar facilities would gradually increase until they reached strong levels in the vicinity of the SEZ. Topographic screening would prevent eastbound trail users from seeing the SEZ until they were about 5 mi from the SEZ, at which point contrast levels would rise quickly to strong levels.
Other Areas of Interest (non-management areas)	U.S. 285[h]	835 mi	2.9 mi of the highway is immediately adjacent to the SEZ	NA[i]	NA	As highway users passed the extreme southern tip of McIntyre Ridge (approximately 1.3 mi west of the SEZ), the entire SEZ would come into view. As users travel along the northwest side of the SEZ, facilities located within the SEZ would strongly attract the eye and would likely dominate views from U.S. 285.

[a] To convert mi to km, multiply by 1.609.

[b] To convert acres to km^2, multiply by 0.004047.

Footnotes continued on next page.

TABLE C.3.2-2 (Cont.)

[c] Mileage (within all columns) is used only for trails or roads, unless otherwise specified.

[d] Distances at the point of closest approach are based on the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries would result in changes to these calculations.

[e] The total acreage/mileage visible within 25 mi (40 km) of the SEZ is based on the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries would result in changes to these acreages/mileages, as well as the percent total acreages/mileages visible within 25 mi (40 km) of the SEZ.

[f] The assessment of impacts is based on the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries may result in reduced impacts in some of the SVRAs/SVLs due to the reduction in the overall footprint of the SEZ.

[g] Length of Old Spanish National Historic Trail: BLM (2011a).

[h] Length of U.S. 285: US-Highways.com (2010).

[i] NA = data not available.

- As deemed necessary, based on viewshed analysis results, prepare wireframe Google Earth™ visualizations of hypothetical solar facilities in the SEZ depicting the 80% development scenario to better estimate potential impacts.

This additional analysis may help judge potential visual contrast more accurately for most KOPs. For KOPs of particularly high sensitivity, a site visit with photography and superimposition of the wireframe models onto the photos might be required or desired.

C.3.2.5.12 Acoustic Environment

None.

C.3.2.5.13 Paleontological Resources

The BLM Regional Paleontologist will be contacted to determine whether additional information is available regarding the paleontological potential of the SEZ. A preliminary paleontological survey could be conducted to verify the Potential Fossil Yield Classification (PFYC) of the SEZ as Class 3b as used in the Draft Solar PEIS and determine whether paleontological resources are likely to be affected.

C.3.2.5.14 Cultural Resources and Native American Concerns

Approximately 3.8% of the original 1,522-acre (6.2-km^2) proposed De Tilla Gulch SEZ has been surveyed (roughly 51 acres [0.2 km^2]; however, one of the larger surveys conducted was in an area no longer included in the SEZ; thus the amount of survey coverage of the revised 1,089 acres (4.4 km^2) is less than that. No sites have been recorded to date within the SEZ. Fifteen sites have been recorded within 5 mi (8 km) of the SEZ. Paleoindian sites could be encountered throughout the San Luis Valley. The Old Spanish National Historic Trail is mapped as within 0.25 mi (0.4 km) of the SEZ, but this segment of the trail has not been ground-truthed and may actually cross the SEZ; a high-potential segment of that trail is located within the viewshed of the SEZ. The West Fork of the Old Spanish Trail is a significant cultural resource, although not part of the National Historic Trail system, and is also located within the viewshed of the SEZ. The destruction or degradation of important plant resources and the destruction of habitat or impediments to the movement of culturally important wildlife are also potential impacts of concern within the SEZ.

The following additional data collection efforts could reduce the uncertainty about potential impacts on cultural resources:

- Conduct a Class I literature file search to better understand (1) the site distribution pattern in the vicinity of the SEZ, (2) trail networks through existing ethnographic reports, and (3) overall cultural sensitivity of the landscape.

- Conduct a Class II Stratified Random Sample Survey of the SEZ to obtain a 10% sample (roughly 109 acres [0.4 km^2]). Areas of interest, as determined through a Class I review, should also be identified prior to establishing the survey design and sampling strategy. A Class III inventory of linear features detected using LIDAR in the De Tilla Gulch SEZ is currently underway and will account for a portion of the recommended sample.

- Prepare a cultural sensitivity map based on results of the Class II survey and Class I review.

- Identify the location of the Old Spanish National Historic Trail in the vicinity of the SEZ and viewshed analyses from key points along the trail. High-potential segments of the trail have been identified to the east between Crestone, Colorado, and the Fourmile East SEZ and also to the west, west of Saguache, Colorado. The trail segment to the east would be within the viewshed at about 16 mi (26 km) regardless of solar technology type. Also within the viewshed at about 6 mi (10 km) would be the West Fork of the Old Spanish Trail, not currently part of the National Historic Trail system, but still an important trail and significant cultural resource that would be visually affected along an approximately 20-mi (32-km) stretch of the trail.

- Continue with government-to-government consultation as described in Section 2.4.3, including follow-up to recent ethnographic studies with Tribes not included in the original studies to determine whether those Tribes have similar concerns. The De Tilla Gulch SEZ falls in the traditional use area of primarily the Northern Cheyenne and the Northern Arapaho, although potentially significant sites and landscapes for the Navajo and the Pueblos may also be present near the SEZ (Blanca Peak, Great Sand Dunes, San Luis Lakes). Potential topics to be discussed during consultation include the above-mentioned places, trail systems, mountain springs, mineral resources, burial sites, ceremonial areas, and plant and animal resources.

C.3.2.5.15 Socioeconomics and Environmental Justice

None.

C.3.2.5.16 Cumulative Impact Considerations

None.

C.3.3 Fourmile East

C.3.3.1 Summary of Potential Impacts Identified in the Draft Solar Programmatic Environmental Impact Statement (PEIS)

The proposed Fourmile East solar energy zone (SEZ), as presented in the Draft Solar PEIS, had a total area of 3,882 acres (15.7 km^2). It is located in Alamosa County in south–central Colorado (Figure C.3.3-1). The town of Alamosa is located about 13 mi (21 km) west of the SEZ.

A U.S. Department of the Interior Bureau of Land Management (BLM)-designated transmission corridor that does not currently contain any transmission facilities passes through most of the SEZ. This corridor could limit development in the SEZ because solar facilities cannot be constructed under transmission lines. The Draft Solar PEIS discussion of impacts of solar energy development in the SEZ acknowledged that the presence of the corridor could reduce the amount of land available for solar power production, and that conversely, full development of solar facilities within the SEZ would limit the use of the transmission corridor.

The Draft Solar PEIS identified a 69-kV transmission line that ends about 2 mi (3 km) south of the SEZ as the nearest point of connection of the SEZ to the grid. There is also a 230-kV line located about 8 mi (13 km) to the north of the SEZ. The location of new transmission that could be constructed for this SEZ in the future may be different from that assumed in the Draft Solar PEIS. Details on the updated transmission impact assessment to be included in the Final Solar PEIS are provided in Section C.7.1 of this appendix. Analysis of transmission lines and/or access roads will be completed as necessary as part of the project-specific environmental reviews (see Section 2.2.2.2.2 of this Supplement).

Potential adverse impacts identified in the Draft Solar PEIS included the following:

- Possible non-mitigable impacts are related to induced changes to existing land uses on nearby state and private lands.

- SEZ development would have a significant effect on recreational users of the Blanca Area of Critical Environment Concern/Special Recreation Management Area (ACEC/SRMA), and there would be an adverse impact on wilderness characteristics in a small portion of the Sangre de Cristo Wilderness Area (WA). There is potential for adverse impacts on night sky viewing opportunities in Great Sand Dunes National Park (NP) and in other specially designated areas near the SEZ. The historic setting along 12 mi (19 km) of the Old Spanish National Historic Trail would be adversely affected, and there would be potential impact on 14 mi (23 mi) of the Los Caminos Antiguos Scenic Byway. There may be an adverse impact on Native American religious values associated with Blanca Peak. Because the SEZ is located within the recently designated Sangre de Cristo National Heritage Area, solar development could be inconsistent with this new designation.

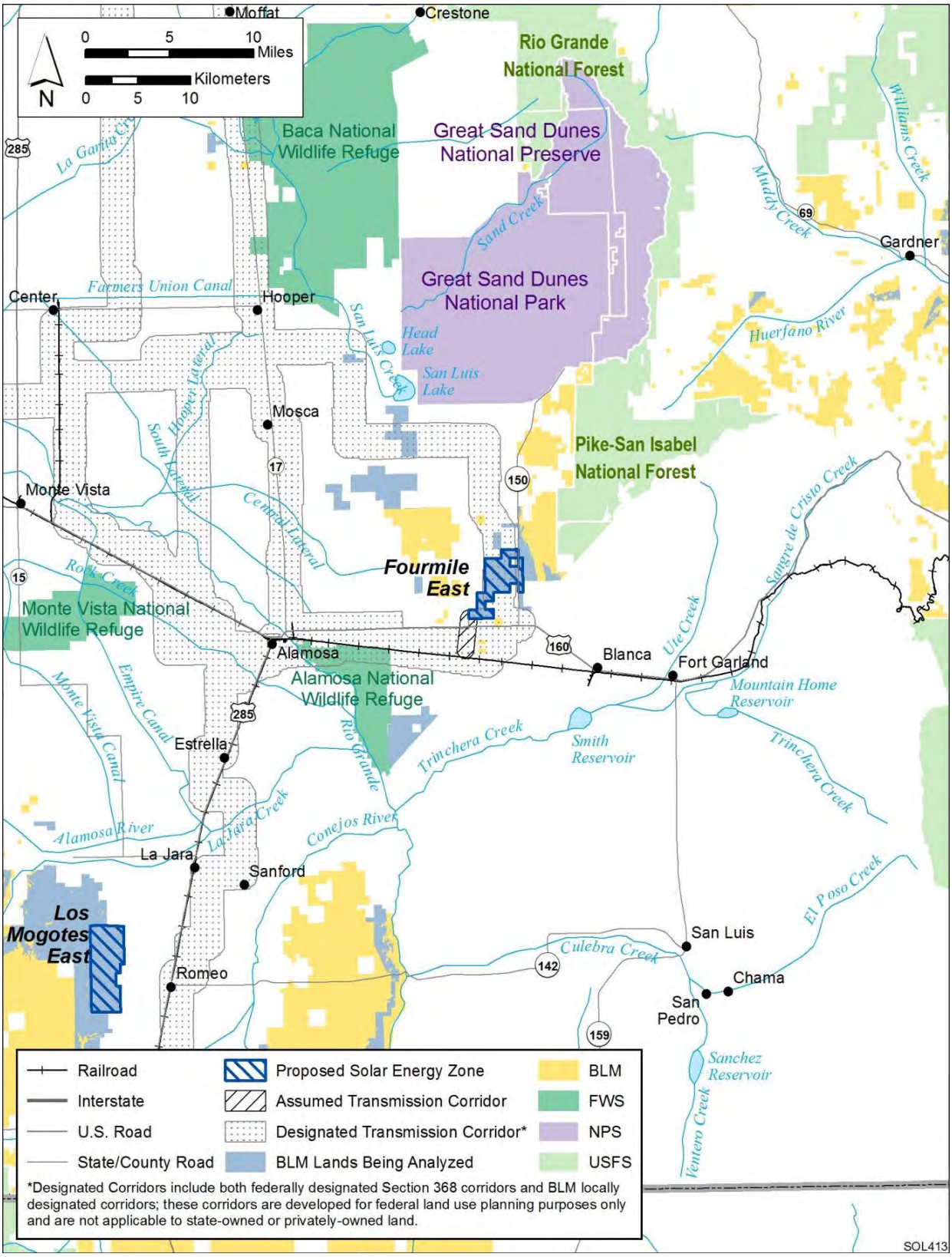


FIGURE C.3.3-1 Proposed Fourmile East SEZ as Presented in the Draft Solar PEIS

- One seasonal grazing allotment would likely be cancelled and 139 animal unit months would be lost. One grazing permittee would be displaced and would incur economic and possible social impacts.

- Development of the SEZ would be a dominating factor for the scenic byway that passes through the SEZ and for a portion of the scenic railway route that passes south of the SEZ. Because of the large number of specially designated areas, scenic resources, and sensitive recreation resources near the SEZ, it is likely that there would be unmitigated adverse impacts on recreational use from development of the SEZ.

- The SEZ is located under a military training route (MTR), and any solar facility that impinges into military airspace could interfere with military training and would be a concern to the military.

- Impacts on soil resources (e.g., soil compaction, soil horizon mixing, soil erosion by wind and runoff, sedimentation, and soil contamination) could occur.

- Groundwater use would deplete the aquifer to the extent that, at a minimum, wet-cooling options would not be feasible.

- Clearing of a large portion of the proposed SEZ could primarily affect semidesert shrub steppe and greasewood flat, and may adversely affect desert dry wash, playa, wetland, greasewood flat, and sand dune habitats, depending on the amount of habitat disturbed. The establishment of noxious weeds could result in habitat degradation.

- Potentially suitable habitat for 59 special status species and more than 50 wildlife species occurs in the affected area of the proposed SEZ; less than 1% of the potentially suitable habitat for any of these species occurs in the region that would be directly affected by development.

- If aquatic biota are present in the small wetlands along the western boundary of the proposed SEZ, they could be affected by the direct removal of surface water features within the construction footprint, a decline in habitat quantity and quality due to water withdrawals and changes in drainage patterns, as well as increased sediment and contaminant inputs associated with ground disturbance and construction activities.

- Temporary exceedances of ambient air quality standards for particulate matter at the SEZ boundaries are possible during construction. These high concentrations. however, would be limited to the immediate area surrounding the SEZ boundary. Modeling indicates that emissions from construction activities could exceed Class I Prevention of Significant Deterioration (PSD)

PM_{10} (particulate matter with an aerodynamic diameter of 10 μm or less) increments at the nearest federal Class I area (the Great Sand Dunes WA).

- Strong visual contrasts could be observed by visitors to the Old Spanish National Historic Trail and Blanca Wetlands SRMA/ACEC, and from some locations along the Los Caminos Antiguos Scenic Byway and along State Highway 150 and U.S. 160. Weak to strong visual contrasts could be observed by visitors to the Sangre de Cristo WA, while moderate visual contrasts could be observed by visitors to the Zapata Falls SRMA and Blanca Peak.

- There is potential for impacts on significant paleontological and cultural resources. Further evaluation is needed to determine the effects of solar energy development on a high-potential segment of the Old Spanish National Historic Trail. It is possible that there would be Native American concerns about culturally significant archaeological sites, the potential for Native American human remains and associated cultural items to be present within the proposed SEZ, and the potential for visual and noise effects of solar energy development on culturally significant locations within the valley as consultation continues and additional analyses are undertaken. Effects on traditionally important plants and animals are also possible.

- Minority populations occur within a 50-mi (80-km) radius of the proposed SEZ boundary; thus adverse impacts of solar development could disproportionately affect minority populations.

C.3.3.2 Summary of Comments Received

Most of the comments received from environmental groups on the proposed Fourmile East SEZ were in favor of identifying the area as an SEZ (e.g., The Wilderness Society et al.[15]). However, these groups proposed adjusting the eastern boundary 0.25 mi (0.40 km) west of State Highway 150 to avoid adverse impacts on the Old Spanish National Historic Trail and the Los Caminos Antiguos Scenic Byway (The Wilderness Society et al., Cultural Resources Preservation Coalition, and Partnership for the National Trails System). The San Luis Valley Renewable Communities Alliance was concerned that the SEZ contains winter range for pronghorn. Also, the southern tip of the SEZ intersects a Gunnison prairie dog colony of unknown status, and surveys for the species have not been conducted. The Wilderness Society provided recommendations to avoid impacts on the Gunnison prairie dog, including avoidance of active colonies, clearance surveys within any area defined by the Colorado Division of Wildlife (CDOW) as having colonies of inactive or unknown status, potential off-site mitigation within

[15] The Wilderness Society, Center for Native Ecosystems, Biodiversity Conservation Alliance, Rocky Mountain Recreation Initiative, Colorado Wild, Wild Connections, High Country Citizens' Alliance, Colorado Environmental Coalition, Audubon Colorado, Natural Resources Defense Council, Sierra Club, Soda Mountain Wilderness Council, and Sierra Trek submitted joint comments on the proposed Colorado SEZs. Those comments are attributed to The Wilderness Society et al.

areas of high species viability, and project siting that avoids blocking migration corridors used by the species to migrate between colonies.

C.3.3.3 Changes to the SEZ

The proposed Fourmile East SEZ has been reconfigured to eliminate 999 acres (4 km^2), mainly along the eastern boundary of the SEZ, and also a small area on the west side of the proposed SEZ (see Figure C.3.3-2). Excluding these areas will avoid impacts on known cultural resources, a historic playa basin, Caminos Antiguos Scenic Byway, the Old Spanish National Historic Trail, the Pike National Historic Trail, big game winter range, and important riparian habitat. Small additional wetland areas with a total area of about 1-acre (0.004-km^2) have been identified as non-development areas within the SEZ. The remaining developable area within the SEZ area is 2,882 acres (11.7 km^2).

To reduce the visual resource impacts of solar development within the proposed Fourmile East SEZ, SEZ-specific visual resource mitigation requirements have been developed. Within the area of the SEZ that was labeled to meet Visual Resource Management (VRM) Class II-consistent objectives in the Draft Solar PEIS, all forms of development will be limited to 10 ft (3.3 m) or less, and the technology must be restricted to either photovoltaic technologies of less than 10 ft (3.3 m), or technologies with comparable or lower heights and reflectivity. For all remaining portions of the SEZ, the solar development will be restricted to either PV technologies of less than 3.3 m (10 ft), or technologies with comparable or lower height and reflectivity. Additional required mitigation measures to address potential visual resource impacts are described in Section C.7.3 of this appendix.

Because of the extensive potential impacts from solar development in the portion of the Fourmile East SEZ that has been eliminated, those lands will be considered solar right-of-way exclusion areas; that is, applications for solar development on those lands will not be accepted by the BLM.

C.3.3.4 Wilderness Character Status of SEZ

A recently maintained inventory of wilderness characteristics was used to determine whether public lands within the Fourmile East SEZ have wilderness characteristics. The finding of this inventory was that these lands do not contain wilderness characteristics.

C.3.3.5 Additional Data Collection Recommended

C.3.3.5.1 Lands and Realty

None.

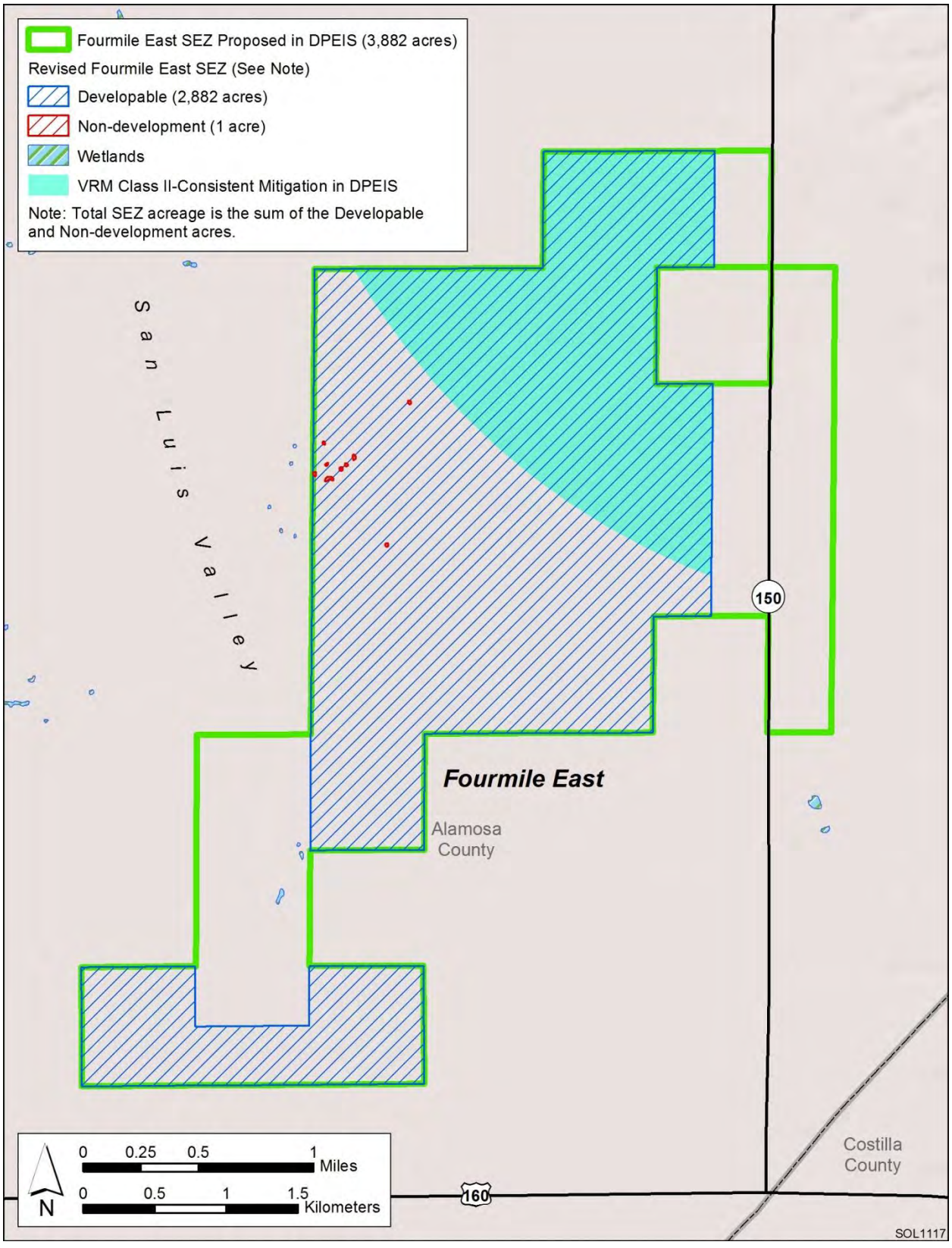


FIGURE C.3.3-2 Proposed Fourmile East SEZ as Described in this Supplement

C.3.3.5.2 Specially Designated Areas and Lands with Wilderness Characteristics

None.

C.3.3.5.3 Rangeland Resources

Livestock Grazing. The potential impact on the Tobin Creek and Foothills grazing allotments will be re-evaluated based on the revised boundaries.

Wild Horses and Burros. None.

C.3.3.5.4 Recreation

The San Luis Valley-wide effort to promote recreational use could warrant additional consideration. The status of off-highway vehicle use designation in the area may also warrant additional consideration.

C.3.3.5.5 Military and Civilian Aviation

The proposed technology restrictions described in Sections C.3.3.3 and C.7.3 are expected to minimize or eliminate any potential issues with MTRs; however, the BLM will continue to consult with the U.S. Department of Defense regarding potential issues with MTRs.

C.3.3.5.6 Geologic Setting and Soil Resources

None.

C.3.3.5.7 Minerals

Additional information on leasable and strategic minerals in the vicinity of the proposed SEZ will be provided in the Final Solar PEIS to inform the Department of the Interior's decision on a proposed 20-year withdrawal of SEZ lands.

C.3.3.5.8 Water Resources

The following additional data and actions would help further characterize potential impacts on water resources for the proposed Fourmile East SEZ. A more detailed discussion of

each of these activities is included in the water resources action plan provided in Section C.7.2 of this appendix.

- Prepare a planning-level water resources inventory of the San Luis Valley (eastern portion).

- Perform field surveys and hydrologic analyses to support jurisdictional water determinations and floodplain identifications. Tasks include:
  - Surveying wetland and low-lying areas for surface elevations, high water marks, and sediment conditions; and
  - Conducting hydrologic rainfall-runoff-routing analyses to identify 100-year floodplain areas.

- Coordinate with the U.S. Army Corps of Engineers (USACE) (Albuquerque District) regarding jurisdictional water determinations for the SEZ. Water features to be considered include:
  - Small wetland features.

- Identify 100-year floodplain exclusion areas for the SEZ. This task would require coordination with the Federal Emergency Management Agency and the Colorado Water Conservation Board.

- Describe the formation of a stakeholder committee to conduct long-term monitoring of water resources. This activity would entail:
  - Identifying key stakeholder agencies,
  - Discussing general features of a monitoring program, and
  - Working with the U.S. Geological Survey and Colorado Division of Water Resources (CDWR) (Division 3) to develop groundwater monitoring well design and numerical groundwater models. (Groundwater monitoring should coordinate with the Rio Grande Decision Support System through the CDWR [Division 3].)

C.3.3.5.9 Ecological Resources

Vegetation and Plant Communities. The following additional data-gathering actions would help further characterize potential impacts on vegetation and plant communities for the proposed Fourmile East SEZ:

- Identify and map the location and areal extent of dry wash, playa, wetland, and greasewood flat communities within the SEZ. Identify and map the location and areal extent of these habitats, as well as riparian habitats, outside the SEZ that may be affected by hydrologic changes, including groundwater elevations, and changes in water, sediment, and contaminant inputs associated

with runoff. Such effort may help determine habitat characteristics, including water source, hydrologic regime, and dominant plant species.

- Identify and map the location and areal extent of sand dunes and sand transport systems within the SEZ.

Wildlife. The following additional data-gathering action would help further characterize potential impacts on wildlife resources for the SEZ:

- Conduct pre-disturbance surveys within the SEZ to determine the use of the SEZ as a movement/migratory corridor or as important habitat for elk, mule deer, and pronghorn.

Aquatic Biota. Investigations recommended under the water resources action plan (Section C.3.3.5.8) would be useful in characterizing and protecting habitat available to aquatic biota. Wetlands identified within the SEZ may or may not contain aquatic biota; therefore, preliminary evaluations of these surface water features could be conducted to determine the potential for aquatic communities to be present.

Special Status Species. The following additional data-gathering actions would be useful in further characterizing and protecting habitat available to special status species:

- Conduct pre-disturbance surveys within the SEZ to determine the presence and abundance of those special status species that are (1) federally listed, proposed for listing, or candidates for listing under the Endangered Species Act (ESA); or (2) listed by the State of Colorado as threatened or endangered; or (3) designated as sensitive by the Colorado BLM State Office. These species are listed in Table C.3.3-1. Surveys should focus on areas identified as potentially suitable, and the suitability of these habitats to support these special status species should be determined in the field. All field-determined suitable habitats for special status species should be mapped. Target species and survey protocols should be developed in coordination with the U.S. Fish and Wildlife Service and CDOW. The BLM is currently conducting surveys for various special status species (e.g., mountain plover, western burrowing owl, Gunnison prairie dog) within the State of Colorado. In areas where these surveys overlap with the Colorado SEZs and areas of direct effects, the BLM survey information will be used to make appropriate determinations regarding the potential occurrence of species and their habitats. Additional survey efforts may be necessary, as appropriate.

  The Draft Solar PEIS presents a table of special status species for which potential impacts need to be evaluated prior to development in the proposed Fourmile East SEZ. The list of species presented in Table 10.3.12.1-1 of the Draft Solar PEIS also includes species listed by the State of Colorado and

TABLE C.3.3-1 Special Status Species That May Occur in the Vicinity of the Proposed Fourmile East SEZ[a]

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Plants			
Brandegee's milkvetch	*Astragalus brandegeei*	BLM-S	Sandy or gravelly banks, flats, and stony meadows within pinyon-juniper woodlands. Substrates are usually sandstone with granite or basalt. Elevation ranges between 5,400 and 8,800 ft.[d] Nearest occurrences are located 40 mi[e] southwest of the SEZ. About 733,938 acres[f] of potentially suitable habitat occurs within the SEZ region.
Fragile rockbrake	*Cryptogramma stelleri*	BLM-S	Moist soils on shaded limestone cliffs at elevations greater than 7,000 ft and often in association with mosses. The nearest known occurrences are located in the San Juan Mountains, about 50 mi to the west of the SEZ. About 12,297 acres of potentially suitable habitat occurs within the SEZ region.
Many-stemmed spider-flower[g]	***Cleome multicaulis***	BLM-S	San Luis Valley on saturated soils created by waterfowl management on public lands. Nearest occurrences intersect the affected area from the Blanca Wetlands, about 3 mi west and northwest of the SEZ. About 4,439 acres of potentially suitable habitat occurs within the SEZ region in the Blanca Wetlands.
Ripley's milkvetch	*Astragalus ripleyi*	BLM-S	Mixed conifer and shrubland habitats on rocky substrates at elevations above 8,000 ft. The nearest known occurrences are located 30 mi to the west of the SEZ. About 394,308 acres of potentially suitable habitat occurs within the SEZ region.
Rock-loving aletes	*Neoparrya lithophila*	BLM-S	Igneous rock outcrops on north-facing cliffs and ledges within pinyon-juniper woodlands at elevations greater than 7,000 ft. Endemic to south-central Colorado. Found as near as 15 mi southwest of the SEZ. About 434,485 acres of potentially suitable habitat occurs within the SEZ region.
Birds			
American peregrine falcon	*Falco peregrinus anatum*	BLM-S	Year-round resident in the SEZ region. Open spaces associated with high, near- vertical cliffs and bluffs above 200 ft in height overlooking rivers. Nearest occurrences are from the Rio Grande National Forest about 40 mi northwest of the SEZ. About 3,277,511 acres of potentially suitable habitat occurs within the SEZ region.
Bald eagle	*Haliaeetus leucocephalus*	CO-T	Year-round resident in the SEZ region. Seldom seen far from water, especially larger rivers, lakes, and reservoirs. Occurs locally in semiarid shrubland habitats where there is an abundance of small mammal prey. Known to occur in riparian habitats along the Rio Grande about 10 mi west of the SEZ. About 2,072,279 acres of potentially suitable habitat occurs within the SEZ region.
Ferruginous hawk	*Buteo regalis*	BLM-S	Summer resident in the affected area, but year-round resident in portions of the SEZ region. Grasslands, sagebrush, and saltbrush habitats, as well as the periphery of pinyon-juniper woodlands. Known to occur in San Luis State Park and Wildlife Area, about 10 mi northwest of the SEZ. About 1,360,614 acres of potentially suitable habitat occurs within the SEZ region.

TABLE C.3.3-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Birds (Cont).			
Mountain plover	*Charadrius montanus*	BLM-S	Summer resident in the SEZ region. Prairie grasslands and arid plains and fields. Nests in shortgrass prairies associated with prairie dogs, bison, and cattle. Known to occur within 25 mi southeast of the SEZ. About 1,709,413 acres of potentially suitable habitat occurs within the SEZ region.
Southwestern willow flycatcher	*Empidonax traillii extimus*	ESA-E; CO-E	Nests in thickets, scrubby and brushy areas, open second growth, swamps, and open woodlands in the Alamosa National Wildlife Refuge along the Rio Grande, about 7.5 mi southwest of the SEZ. Suitable habitats may occur in the Blanca Wetlands about 3 mi west of the SEZ. About 210,962 acres of potentially suitable habitat occurs within the SEZ region.
Western burrowing owl	*Athene cunicularia hypugaea*	BLM-S; CO-T	Open grasslands and prairies, as well as disturbed sites such as golf courses, cemeteries, and airports throughout the SEZ region. Nests in burrows constructed by mammals (prairie dog, badger, etc.). Known to occur in the San Luis Valley. About 2,209,000 acres of potentially suitable habitat occurs in the SEZ region.
Mammals			
Big free-tailed bat	*Nyctinomops macrotis*	BLM-S	Year-round resident in the SEZ region. Roosts in rock crevices on cliff faces or in buildings. Forages primarily in coniferous forests and arid shrublands to feed on moths. May occur in the San Luis Valley. About 2,745,262 acres of potentially suitable habitat occurs within the SEZ region.
Gunnison's prairie dog	*Cynomys gunnisoni*	ESA-C	Mountain valleys, plateaus, and open brush habitats in the project area at elevations between 6,000 and 12,000 ft. Known to occur as near as 20 mi south of the SEZ. About 1,938,641 acres of potentially suitable habitat occurs within the SEZ region.
Pale Townsend's big-eared bat	*Corynorhinus townsendii pallescens*	BLM-S	Year-round resident in the SEZ region. Semiarid shrublands, pinyon-juniper woodlands, and montane forests to elevations of 9,500 ft. Roosts in caves, mines, rock crevices, under bridges, or within buildings. Known to occur in the San Luis Valley about 25 mi southwest of the SEZ. About 3,075,160 acres of potentially suitable habitat occurs within the SEZ region.

[a] The listings for (1) federally listed, proposed for listing, or candidates for listing under the ESA, and (2) Colorado BLM State Office sensitive species have been updated since the release of the Draft Solar PEIS.

[b] BLM-S = listed as a sensitive species by the BLM; CO-E = listed as endangered by the State of Colorado; CO-T = listed as threatened by the State of Colorado; ESA-C = candidate for listing under the ESA; ESA-E = listed as endangered under the ESA.

[c] For plant species, potentially suitable habitat was determined by using Southwest Regional Gap Analysis Project (SWReGAP) land cover types (USGS 2005). For terrestrial vertebrate species, potentially suitable habitat was determined by using SWReGAP habitat suitability and land cover models. Area of potentially suitable habitat for each species is presented for the SEZ region, which is defined as the area within 50 mi (80 km) of the SEZ center.

[d] To convert ft to m, multiply by 0.3048.

[e] To convert mi to km, multiply by 1.609.

[f] To convert acres to km^2, multiply by 0.004047.

[g] Species in bold text have been recorded or have designated critical habitat in the affected area.

species ranked by the State of Colorado as S1 or S2 or species of concern. Based on the design features presented in the Draft Solar PEIS, the potential for impacts on these additional species will also need to be addressed before development could occur in the SEZ.

C.3.3.5.10 Air Quality and Climate

None.

C.3.3.5.11 Visual Resources

Visual resources will be re-evaluated for the Final Solar PEIS based on the boundary adjustments and proposed technology restrictions described in Section C.3.3.3 of this Supplement. A summary of the Draft Solar PEIS visual contrast analysis for the proposed Fourmile East SEZ is provided in Table C.3.3-2. This table includes only those resources that would be subject to moderate or strong visual contrast. The Draft Solar PEIS visual impact analysis predicted these levels of visual contrast from solar energy development in the Fourmile East SEZ for the following sensitive visual resource areas (SVRAs) and sensitive viewing locations (SVLs):

- Old Spanish National Historic Trail
- Sangre de Cristo WA
- Blanca Wetlands SRMA
- Zapata Falls SRMA
- Blanca Peak
- Rio Grande Scenic Railroad.

The following steps could be taken to better understand potential impacts on these SVRAs and SVLs from solar development in the Fourmile East SEZ:

- Identify key observation points (KOPs) within these areas through working with the management agency or other local stakeholders.
- Conduct viewshed analyses from the KOPs to determine how much of the SEZ would be in view from each KOP.
- As deemed necessary, based on viewshed analysis results, prepare wireframe Google Earth™ visualizations of hypothetical solar facilities in the SEZ depicting the 80% development scenario to better estimate potential impacts.

TABLE C.3.3-2 Summary of Potential Visual Impacts on SVRAs and SVLs within the 25-mi (40-km) Viewshed of the Proposed Fourmile East SEZ

Management Area Category	SVRA/SVL within 25 mi[a] of SEZ	Total Acreage/ Mileage[a,b,c] of SVRA/SVL	Distance from SEZ at Point of Closest Approach[d]	Total Acreage/Mileage Visible within 25 mi[e]	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes[f]
National Historic Trail	Old Spanish National Historic Trail[g]	2,700 mi	Passes within 0.86 mi on the east side of the SEZ	50 mi	1.9	A high potential segment of the trail begins 1.25 mi northeast of the northeast corner of the SEZ; approximately 25 mi of the high-potential segment is within the 25-mi viewshed. Nearby elevated locations with open views of the SEZ could be subject to strong levels of visual contrast. Some viewpoints at lower elevations would have expansive views of the SEZ, but because of the lower viewing angle, these would be expected to be subjected to lower levels of visual contrast. Contrast levels would range from minimal levels for distant or low-elevation points to strong levels for locations close to the SEZ and for those points on the trail at higher elevations than the SEZ.
WAs	Sangre de Cristo	217,702 acres	2.8 mi northeast of the SEZ	10,479 acres	4.8	Solar energy development would be expected to create weak to strong visual contrasts for viewers. Visible portions extend up to 4.5 mi from the northern boundary of the SEZ.

TABLE C.3.3-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi[a] of SEZ	Total Acreage/ Mileage[a,b,c] of SVRA/SVL	Distance from SEZ at Point of Closest Approach[d]	Total Acreage/Mileage Visible within 25 mi	Percent Total Acreage/Mileage Visible within 25 mi	Notes[f]
SRMAs	Blanca Wetlands	8,598 acres	Southern unit is located 0.5 mi (0.8 km) from the western edge of the SEZ; the northern unit is located 1.8 mi from the northwest corner of the SEZ	8,598 acres	100.0	Solar energy development would be expected to cause weak to strong visual contrasts with the generally natural-appearing surroundings. The SEZ is visible from within the SRMA at distances between 0.5 and 6.7 mi.
	Zapata Falls	3,702 acres	4.6 mi from the northeast corner of the SEZ	2,338 acres	63.2	Solar development would be expected to create weak to moderate contrasts as seen from visible locations within the SRMA. The visible area extends from the point of closest approach to 7.0 mi from the SEZ.
Other Areas of Interest (non-management areas)	Blanca Peak	NA[h]	7 mi (11 km) northeast of the SEZ	NA	NA	As seen from Blanca Peak, the SEZ would occupy a substantial part of the observer's field of view; solar energy development would be likely to attract attention, though it would not be expected to dominate the view and would thus be expected to create moderate levels of visual contrasts.

TABLE C.3.3-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi[a] of SEZ	Total Acreage/ Mileage[a,b,c] of SVRA/SVL	Distance from SEZ at Point of Closest Approach[d]	Total Acreage/Mileage Visible within 25 mi	Percent Total Acreage/Mileage Visible within 25 mi	Notes[f]
Other Areas of Interest (non-management areas) (*Cont.*)	Rio Grande Scenic Railroad	NA	Passes within 2.3 mi of the southern boundary of the SEZ	NA	NA	Solar energy development would be expected to cause strong visual contrasts with the generally natural-appearing surroundings. Because this viewpoint is near the closest point on the railroad to the SEZ, other potential viewpoints on the railroad would be subject to similar or lower contrast levels.

[a] To convert mi to km, multiply by 1.609.

[b] To convert acres to km^2, multiply by 0.004047.

[c] Mileage (within all columns) is used only for trails or roads, unless otherwise specified.

[d] Distances at the point of closest approach are based on the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries would result in changes to these calculations.

[e] The total acreage/mileage visible within 25 mi (40 km) of the SEZ is based on the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries would result in changes to these acreages/mileages, as well as the percentage of total acreages/mileages visible within 25 mi (40 km) of the SEZ.

[f] The assessment of impacts is based on the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries may result in reduced impacts in some of the SVRAs/SVLs due to the reduction in the overall footprint of the SEZ.

[g] Length of trail: BLM (2011a).

[h] NA = data not available.

This additional analysis may help judge potential visual contrast more accurately for most KOPs. For KOPs of particularly high sensitivity, a site visit with photography and superimposition of the wireframe models onto the photos might be required or desired.

Additional required mitigation measures to address potential visual resource impacts are given in Section C.7.3 of this appendix.

C.3.3.5.12 Acoustic Environment

None.

C.3.3.5.13 Paleontological Resources

The BLM Regional Paleontologist will be contacted to determine whether additional information is available regarding the paleontological potential of the SEZ. A preliminary paleontological survey could be conducted to verify the Potential Fossil Yield Classification (PFYC) of the SEZ as Class 4/5 as used in the Draft Solar PEIS and determine whether paleontological resources are likely to be affected.

C.3.3.5.14 Cultural Resources and Native American Concerns

None of the proposed Fourmile East SEZ has been systematically surveyed, although six sites have been recorded to date within the original footprint of the SEZ. More than 100 sites (including isolated finds) have been recorded within 5 mi (8 km) of the SEZ. Paleoindian sites could be encountered throughout the San Luis Valley, and well-known Folsom sites are recorded in similar dune areas just north of the SEZ. Burials have been noted in the nearby Great Sand Dunes NP and Preserve and have been encountered as a result of shifting dunes. The Old Spanish National Historic Trail is mapped as slightly more than 1.0 mi (1.6 km) from the SEZ and includes a high-potential segment of that trail that would be visually affected. Blanca Peak, reportedly a sacred mountain of the Navajo, is located just to the east, and the SEZ is within view of that location. The destruction or degradation of important plant resources and the destruction of habitat or impediments to the movement of culturally important wildlife are also potential impacts of concern within the SEZ.

The following additional data collection efforts could reduce the uncertainty about potential impacts on cultural resources:

- Conduct a Class I literature file search to better understand (1) the site distribution pattern in the vicinity of the SEZ, (2) trail networks through existing ethnographic reports, and (3) overall cultural sensitivity of the landscape.

- Conduct a Class II Stratified Random Sample Survey of the SEZ to obtain a 10% sample (roughly 288 acres [1.2 km^2]). Areas of interest, as determined through a Class I review, should also be identified prior to establishing the survey design and sampling strategy, such as the dune areas throughout the SEZ. Subsurface testing of dune areas should be a component of the sampling strategy as well.

- Prepare a cultural sensitivity map based on results of the Class II survey and Class I review.

- Identify the location of the Old Spanish National Historic Trail in the vicinity of the SEZ and viewshed analyses from key points along the trail. A high-potential segment of the trail has been identified directly to the northeast from Crestone, Colorado, to the SEZ. It is clearly within the viewshed of the SEZ and would be affected visually. A mitigation strategy would need to be developed to address unavoidable impacts on the National Historic Trail.

- Continue with government-to-government consultation as described in Section 2.4.3, including follow-up to up recent ethnographic studies covering some SEZs in Nevada and Utah with Tribes not included in the original studies to determine whether those Tribes have similar concerns. The Fourmile East SEZ falls in the traditional use area of primarily the Northern Cheyenne and the Northern Arapaho, although potentially significant sites and landscapes for the Navajo and the Pueblos may also be present near the SEZ (Blanca Peak, Great Sand Dunes, San Luis Lakes). Potential topics to be discussed during consultation include the above-mentioned places, trail systems, mountain springs, mineral resources, burial sites, ceremonial areas, water resources, and plant and animal resources.

C.3.3.5.15 Socioeconomics and Environmental Justice

None.

C.3.3.5.16 Cumulative Impact Considerations

None.

C.3.4 Los Mogotes East

C.3.4.1 Summary of Potential Impacts Identified in the Draft Solar Programmatic Environmental Impact Statement (PEIS)

The proposed Los Mogotes East solar energy zone (SEZ), as presented in the Draft Solar PEIS, had a total area of 5,918 acres (24 km^2). It is located in Conejos County in south–central Colorado, about 12 mi (19 km) north of the New Mexico border (Figure C.3.4-1). The largest nearby town, Alamosa, is located about 22 mi (35 km) northeast of the SEZ. The town of Romeo is located about 3 mi (5 km) directly to the east of the SEZ.

The Draft Solar PEIS identified a 69-kV transmission line adjacent to the proposed Los Mogotes East SEZ as the nearest point for connection of the SEZ to the grid. The actual location of connection to the transmission grid could be different than that assumed in the Draft Solar PEIS. Details on the updated transmission impact assessment for SEZs to be included in the Final Solar PEIS are provided in Section C.7.1 of this appendix. The Draft Solar PEIS identified U.S. 285, located about 3 mi (5 km) to the east of the SEZ, as the nearest major road, and assumed that a new access road would be constructed from the proposed SEZ to U.S. 285 to support development. The location of a new access road that could be constructed in the future may be different from that assumed in the Draft Solar PEIS. Analysis of transmission lines and/or access roads will be completed as necessary as part of the project-specific environmental reviews (see Section 2.2.2.2.2 of this Supplement).

Potential adverse impacts identified in the Draft Solar PEIS included the following:

- Access to U.S. Department of the Interior Bureau of Land Management (BLM), state, and private lands to the west of the SEZ could be affected by solar development if public access through the SEZ is not maintained.

- The Los Mogotes Area of Environmental Concern (ACEC) is located within 1 mi (1.6 km) of the SEZ and could be affected by its development, with increased vehicular traffic and disturbance that could impair its value to wildlife. The Los Caminos Antiguos Scenic Byway passes within 3 mi (5 km) of the SEZ; any impact of development of the SEZ on the byway and byway users is not known, but it would be highly visible. The SEZ is located within the designated Sangre de Cristo National Heritage Area. The SEZ is within 1 mi (1.6 km) of the route of the West Fork of the North Branch of the Old Spanish Trail, and development would have a major impact on the historic and visual integrity of the trail.

- The Ciscom Flat grazing allotment would likely be cancelled, and the Capulin and Little Mogotes allotments would be reduced, resulting in 475 animal unit months lost. Four grazing permittees would be affected.

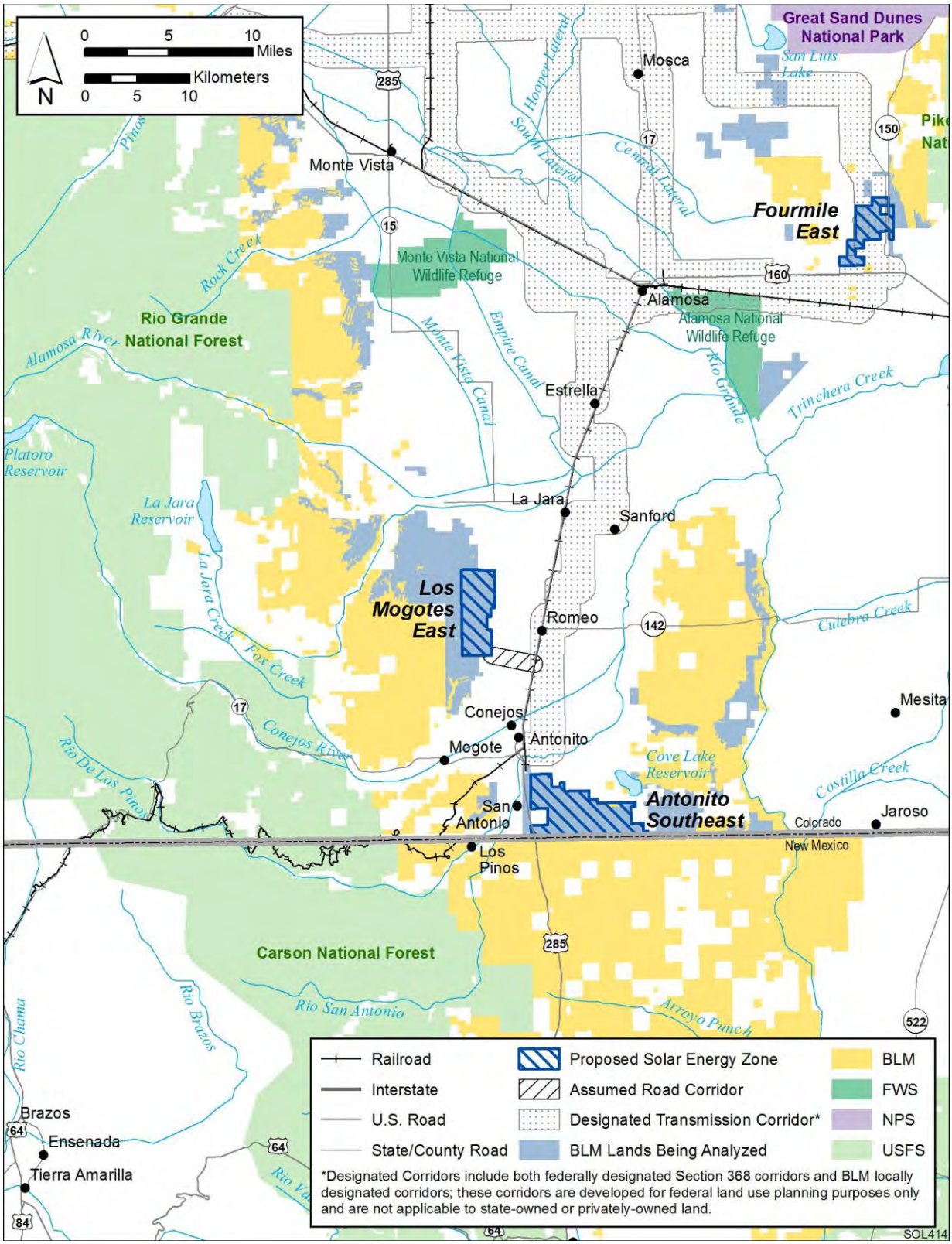


FIGURE C.3.4-1 Proposed Los Mogotes East SEZ as Presented in the Draft Solar PEIS

- Impacts on soil resources (e.g., soil compaction, soil horizon mixing, soil erosion by wind and runoff, sedimentation, and soil contamination) could occur.

- Groundwater use would deplete the aquifer to the extent that, at a minimum, wet-cooling options would not be feasible.

- Clearing of a large portion of the proposed SEZ could primarily affect semidesert shrub steppe and may adversely affect dry wash or greasewood flat habitats, depending on the amount of habitat disturbed. The establishment of noxious weeds could result in habitat degradation.

- Potentially suitable habitat for 51 special status species and more than 50 wildlife species occurs in the affected area of the proposed SEZ; less than 1% of the potentially suitable habitat for any of these species occurs in the region that would be directly affected by development.

- If aquatic biota are present in the small ephemeral washes located in the proposed SEZ, they could be affected by the direct removal of surface water features within the construction footprint, a decline in habitat quantity and quality due to water withdrawals and changes in drainage patterns, as well as increased sediment and contaminant inputs associated with ground disturbance and construction activities.

- Temporary exceedances of ambient air quality standards for particulate matter at the SEZ boundaries are possible during construction. These high concentrations, however, would be limited to the immediate area surrounding the SEZ boundary. Modeling indicates that emissions from construction activities could exceed Class I Prevention of Significant Deterioration (PSD) PM_{10} (particulate matter with an aerodynamic diameter of 10 μm or less) increments at the nearest federal Class I area (the Great Sand Dunes Wilderness Area [WA]).

- Strong visual contrasts could be observed by visitors to the West Fork of the North Branch of the Old Spanish Trail. Weak to moderate visual contrasts could be observed by visitors to the San Luis Hills Wilderness Study Area (WSA), and weak to strong visual contrasts could be observed by users of the Los Caminos Antiguos Scenic Byway where screening is absent. Where screening is absent, strong visual contrasts could be observed from the community of Romeo. Because of these potential impacts, the Draft Solar PEIS recommended that power tower facilities should be prohibited within the SEZ

- During operations, noise levels at the nearest residences could be higher than the U.S. Environmental Protection Agency (EPA) guideline level if concentrating solar power facilities with energy storage technologies (which

could extend the daily operational time by 6 hours or more) were used at the SEZ.

- Few, if any, impacts on significant paleontological resources in a large percentage of the SEZ are likely to occur, although there could be impacts in the eastern 12% of the SEZ. Direct impacts on significant cultural resources could occur. Further evaluation is needed to determine the effects of solar energy development on the West Fork of the North Branch of the Old Spanish Trail. It is possible that there will be Native American concerns about potential visual and noise effects of solar energy development in the SEZ on culturally significant locations within the valley. Effects on traditionally important plants and animals are also possible.

- Minority populations occur within a 50-mi (80-km) radius of the proposed SEZ boundary; thus adverse impacts of solar development could disproportionately affect minority populations.

C.3.4.2 Summary of Comments Received

Most of the comments received from environmental groups on the proposed Los Mogotes East SEZ were in favor of identifying the area as an SEZ (e.g., The Wilderness Society et al.[16]). The San Luis Valley Ecosystem Council was concerned with the distance to transmission lines and commented that shallow soils would make development of the SEZ difficult. The National Wildlife Federation was concerned because the Los Mogotes East SEZ contains pronghorn winter concentration areas. The Colorado Division of Wildlife (CDOW) recommended that the BLM require off-site habitat improvement projects and/or compensatory mitigation to offsets habitat losses in order to minimize both displacement of big game and lost hunting opportunities for pronghorn. The San Luis Valley Renewable Communities Alliance (SLVRCA) was concerned that the SEZ contains winter range, severe winter range, and winter concentration areas for pronghorn, severe winter range and winter range for elk, and winter range for mule deer.

The Wilderness Society and SLVRCA were concerned that the SEZ contains a Gunnison prairie dog colony of unknown status. The SLVRCA also commented that the Old Spanish National Historic Trail is located immediately east of the SEZ, and the area is known to have a number of cultural and historical resources that have not been adequately inventoried. The Conejos County Clean Water, Inc., group was concerned with the socioeconomic impact of solar energy development at the proposed Los Mogotes East SEZ.

[16] The Wilderness Society, Center for Native Ecosystems, Biodiversity Conservation Alliance, Rocky Mountain Recreation Initiative, Colorado Wild, Wild Connections, High Country Citizens' Alliance, Colorado Environmental Coalition, Audubon Colorado, Natural Resources Defense Council, Sierra Club, Soda Mountain Wilderness Council, and Sierra Trek submitted joint comments on the proposed Colorado SEZs. Those comments are attributed to The Wilderness Society et al.

C.3.4.3 Changes to the SEZ

The proposed Los Mogotes East SEZ has been reconfigured to eliminate more than half of the area, 3,268 acres (13.2 km^2) on the western side of the SEZ (see Figure C.3.4-2). Excluding these areas will avoid impacts on significant cultural resources; grazing allotments; an important riparian area; Gunnison prairie dog, burrowing owl, ferruginous hawk, mountain plover, pronghorn birthing and winter habitat; and visual resources.

To reduce the visual resource impacts of solar development within the proposed Los Mogotes East SEZ, allowable solar technologies within the remaining area comprising the SEZ will be limited to photovoltaic systems with panel heights no greater than 10 ft (3.3 m), or technologies with comparable or less height and reflectivity. Additional required mitigation measures to address potential visual resource impacts are given in Section C.7.3 of this appendix.

Because of the extensive potential impacts from solar development in the portion of the Los Mogotes East SEZ that has been eliminated, those lands will be considered solar right-of-way exclusion areas; that is, applications for solar development on those lands will not be accepted by the BLM.

C.3.4.4 Wilderness Character Status of SEZ

A recently maintained inventory of wilderness characteristics was used to determine whether public lands within the Los Mogotes East SEZ have wilderness characteristics. The finding of this inventory was that these lands do not contain wilderness characteristics.

C.3.4.5 Additional Data Collection Recommended

C.3.4.5.1 Lands and Realty

None.

C.3.4.5.2 Specially Designated Areas and Lands with Wilderness Characteristics

None.

C.3.4.5.3 Rangeland Resources

Livestock Grazing. The potential impact on three grazing allotments will be re-evaluated based on the revised boundaries.

Wild Horses and Burros. None.

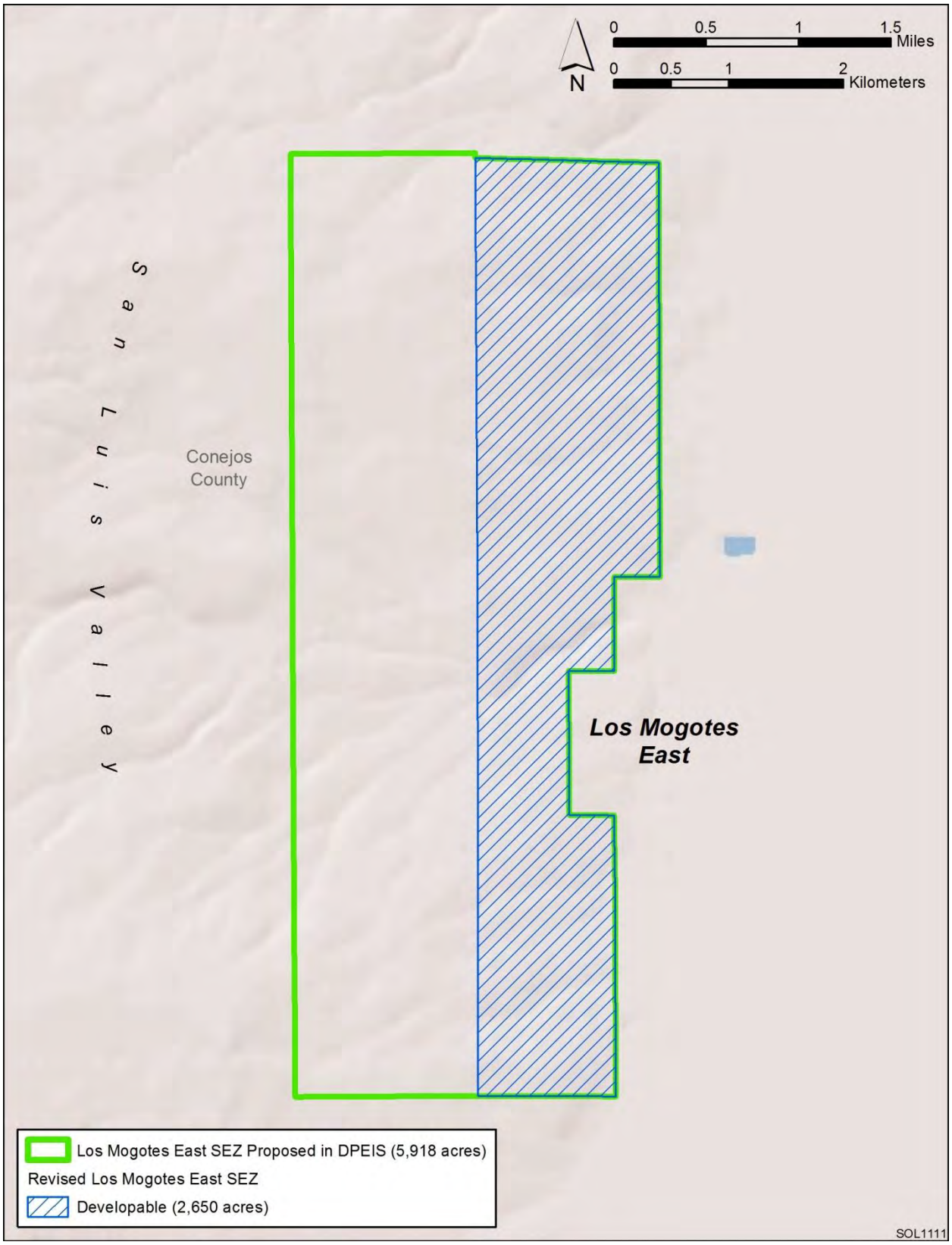


FIGURE C.3.4-2 Proposed Los Mogotes East SEZ as Described in this Supplement

C.3.4.5.4 Recreation

Additional information on the potential impacts on hunting for big game species would help further characterize impacts on recreation. In addition, the San Luis Valley-wide effort to promote recreational use could warrant additional consideration. The status of off-highway vehicle use designations in the area may also warrant additional consideration.

C.3.4.5.5 Military and Civilian Aviation

None.

C.3.4.5.6 Geologic Setting and Soil Resources

None.

C.3.4.5.7 Minerals

Additional information on leasable and strategic minerals in the vicinity of the proposed SEZ will be provided in the Final Solar PEIS to inform the Department of the Interior's decision on a proposed 20-year withdrawal of SEZ lands.

C.3.4.5.8 Water Resources

The following additional data and actions would help further characterize potential impacts on water resources for the proposed Los Mogotes East SEZ. A more detailed discussion of each of these activities is included in the water resources action plan provided in Section C.7.2 of this appendix.

- Prepare a planning-level water resources inventory of the San Luis Valley (southern portion).

- Identify additional ephemeral stream channels and wetland features for non-development areas through consultation with the Colorado Division of Water Resources (CDWR) (Division 3), CDOW, EPA, and U.S. Army Corps of Engineers (USACE) with a focus on:
  - Unnamed ephemeral tributary to Romero Ditch (center of SEZ), and
  - Several unnamed ephemeral streams flowing west to east across SEZ.

- Perform field surveys and hydrologic analyses to support jurisdictional water determinations and floodplain identifications. Tasks include:
  - Surveying ephemeral channels for surface elevations, high water marks, and sediment conditions, and

  - Conducting hydrologic rainfall-runoff-routing analyses to identify 100-year floodplain areas.

- Coordinate with the USACE (Albuquerque District) regarding jurisdictional water determinations for the SEZ. Water features to be considered include:
  - Ephemeral stream channels within the SEZ.

- Identify 100-year floodplain exclusion areas for the SEZ. This task would require coordination with the Federal Emergency Management Agency and the Colorado Water Conservation Board.

- Describe the formation of a stakeholder committee to conduct long-term monitoring of water resources. This activity would entail:
  - Identifying key stakeholder agencies,
  - Discussing general features of a monitoring program, and
  - Working with the U.S. Geological Survey and CDWR (Division 3) to develop groundwater monitoring well design and numerical groundwater models. (Groundwater monitoring should coordinate with the Rio Grande Decision Support System through the CDWR [Division 3].)

C.3.4.5.9 Ecological Resources

Vegetation and Plant Communities. The following additional data-gathering action would help further characterize potential impacts on vegetation and plant communities for the proposed Los Mogotes East SEZ:

- Identify and map the location and areal extent of dry wash and greasewood flat communities within the SEZ. Identify and map the location and areal extent of these habitats, as well as riparian and wetland habitats, outside the SEZ that may be affected by hydrologic changes, including groundwater elevations, and changes in water, sediment, and contaminant inputs associated with runoff. Such efforts could help determine habitat characteristics, including water source, hydrologic regime, and dominant plant species.

Wildlife. The following additional data-gathering action would help further characterize potential impacts on wildlife resources for the SEZ:

- Conduct pre-disturbance surveys within the SEZ to determine the use of the SEZ as a movement/migratory corridor or as important habitat for pronghorn.

Aquatic Biota. Investigations recommended under the water resources action plan (Section C.3.4.5.8) would be useful in characterizing and protecting habitat available to aquatic

biota. Most washes in the SEZ are typically dry and contain water only for brief periods. They may or may not contain aquatic biota; therefore, preliminary evaluations of these surface water features could be conducted to determine the potential for aquatic communities to be present. Any aquatic biota found in these features would likely be desiccation-adapted aquatic invertebrates typical of the region, and the primary value may be as food sources to nonaquatic animals.

Special Status Species. The following additional data-gathering actions would be useful in further characterizing and protecting habitat available to special status species:

- Conduct pre-disturbance surveys within the SEZ to determine the presence and abundance of those special status species that are (1) federally listed, proposed for listing, or candidates for listing under the Endangered Species Act (ESA); or (2) listed by the State of Colorado as threatened or endangered; or (3) designated as sensitive by the Colorado BLM State Office. These species are listed in Table C.3.4-1. Surveys should focus on areas identified as potentially suitable, and the suitability of these habitats to support these special status species should be determined in the field. All field-determined suitable habitats for special status species should be mapped. Target species and survey protocols should be developed in coordination with the U.S. Fish and Wildlife Service (USFWS) and CDOW. The BLM is currently conducting surveys for various special status species (e.g., mountain plover, western burrowing owl, Gunnison prairie dog) within the State of Colorado. In areas where these surveys overlap with the Colorado SEZs and areas of direct effects, the BLM survey information will be used to make appropriate determinations regarding the potential occurrence of species and their habitats. Additional survey efforts may be necessary, as appropriate.

  The Draft Solar PEIS presents a table of special status species for which potential impacts need to be evaluated prior to development in the proposed Los Mogotes East SEZ. The list of species presented in Table 10.4.12.1-1 of the Draft Solar PEIS also includes species listed by the State of Colorado and species ranked by the State of Colorado as S1 or S2 or species of concern. On the basis of design features presented in the Draft Solar PEIS, the potential for impacts on these additional species will also need to be addressed before development could occur in the SEZ.

- Identify and map the location and areal extent of grassland habitat within the SEZ. The suitability of this habitat for special status species should be determined. Species potentially associated with grassland habitat include the mountain plover, ferruginous hawk, and western burrowing owl.

- Identify and map the location and areal extent of wetland habitats within the SEZ. The suitability of these habitats for special status species should be determined. Species potentially associated with wetland habitats include the Brandegee's milkvetch and Great Basin silverspot butterfly.

TABLE C.3.4-1 Special Status Species That May Occur in the Vicinity of the Proposed Los Mogotes East SEZ[a]

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Plants			
Brandegee's milkvetch	*Astragalus brandegeei*	BLM-S	Sandy or gravelly banks, flats, and stony meadows within pinyon-juniper woodlands. Substrates are usually sandstone with granite or occasional basalt. Elevation ranges between 5,400 and 8,800 ft.[d] Nearest occurrences are located 8 mi[e] southwest of the SEZ. About 769,336 acres[f] of potentially suitable habitat occurs within the SEZ region.
Ripley's milkvetch	*Astragalus ripleyi*	BLM-S	Mixed conifer and shrubland habitats on rocky substrates at elevations above 8,000 ft. The nearest known occurrences are located 9 mi to the west of the SEZ. About 375,332 acres of potentially suitable habitat occurs within the SEZ region in the San Juan Mountains.
Rock-loving aletes[g]	***Neoparrya lithophila***	BLM-S	Endemic to south-central Colorado on igneous rock outcrops on north-facing cliffs and ledges. Found within pinyon-juniper woodlands at elevations greater than 7,000 ft. Quad-level occurrences intersect the affected area approximately 5 mi west of the SEZ. About 366,037 acres of potentially suitable habitat occurs within the SEZ region.
Invertebrates			
Great Basin silverspot butterfly	*Speyeria nokomis nokomis*	BLM-S	Streamside meadows and open seepage areas associated with violets (*Viola* spp.). Nearest potentially suitable habitat is located on BLM lands in the La Jara Front Range approximately 9 mi northwest of the SEZ. About 502,789 acres of potentially suitable habitat occurs within the SEZ region.
Birds			
American peregrine falcon	*Falco peregrinus anatum*	BLM-S	Year-round resident in the SEZ region. Open spaces associated with high, near-vertical cliffs and bluffs above 200 ft in height overlooking rivers. Nearest occurrences are from the Rio Grande National Forest approximately 17 mi northwest of the SEZ. About 3,653,800 acres of potentially suitable habitat occurs within the SEZ region.
Bald eagle	***Haliaeetus leucocephalus***	CO-T	Year-round resident in the SEZ region. Seldom seen far from water, especially larger rivers, lakes, and reservoirs. Occurs locally in semiarid shrubland habitats where there is an abundance of small mammal prey. Quad-level occurrences intersect the affected area approximately 5 mi east of the SEZ. About 1,645,504 acres of potentially suitable habitat occurs within the SEZ region.
Ferruginous hawk	***Buteo regalis***	BLM-S	Summer resident in the affected area, but year-round resident in the SEZ region. Grasslands, sagebrush, and saltbrush habitats, as well as the periphery of pinyon-juniper woodlands throughout the San Luis Valley. Quad-level occurrences intersect the affected area approximately 5 mi west of the SEZ. About 1,388,420 acres of potentially suitable habitat occurs within the SEZ region.
Mountain plover	***Charadrius montanus***	BLM-S	Summer resident in the SEZ region. Prairie grasslands and arid plains and fields. Nests in shortgrass prairies associated with prairie dogs, bison, and cattle. Known to occur within 5 mi southeast of the SEZ. About 1,344,723 acres of potentially suitable habitat occurs within the SEZ region.

TABLE C.3.4-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Birds (Cont.)			
Western burrowing owl	*Athene cunicularia hypugaea*	BLM-S	Open grasslands and prairies as well as disturbed sites such as golf courses, cemeteries, and airports throughout the SEZ region. Nests in burrows constructed by mammals (prairie dog, badger, etc.). Known to occur in Conejos County, Colorado. About 2,036,700 acres of potentially suitable habitat occurs in the SEZ region.
Mammals			
Gunnison's prairie dog	***Cynomys gunnisoni***	ESA-C	Mountain valleys, plateaus, and open brush habitats in the project area at elevations between 6,000 and 12,000 ft. Known to occur in the San Luis Valley about 5 mi south and west of the SEZ. About 1,831,120 acres of potentially suitable habitat occurs within the SEZ region.

[a] The listings for (1) federally listed, proposed for listing, or candidates for listing under the ESA, and (2) Colorado BLM State Office sensitive species have been updated since the release of the Draft Solar PEIS.

[b] BLM-S = listed as a sensitive species by the BLM; CO-T = listed as threatened by the State of Colorado; ESA-C = candidate for listing under the ESA.

[c] For plant species, potentially suitable habitat was determined by using Southwest Regional Gap Analysis Project (SWReGAP) land cover types (USGS 2005). For terrestrial vertebrate species, potentially suitable habitat was determined by using SWReGAP habitat suitability and land cover models. Area of potentially suitable habitat for each species is presented for the SEZ region, which is defined as the area within 50 mi (80 km) of the SEZ center.

[d] To convert ft to m, multiply by 0.3048.

[e] To convert mi to km, multiply by 1.609.

[f] To convert acres to km^2, multiply by 0.004047.

[g] Species in bold text have been recorded or have designated critical habitat in the affected area.

- Identify and map the location and areal extent of woodland habitats within the SEZ. The suitability of these habitats for special status species should be determined. Species potentially associated with woodland habitats include the Brandegee's milkvetch, Ripley's milkvetch, rock-loving aletes, and ferruginous hawk.

- Identify and map the location and areal extent of active Gunnison prairie dog colonies within the SEZ should be determined and mapped. Associated burrows also could be used by western burrowing owls.

C.3.4.5.10 Air Quality and Climate

None.

C.3.4.5.11 Visual Resources

Visual resources will be re-evaluated for the Final Solar PEIS based on the boundary adjustments and proposed technology restrictions described in Section C.3.4.3 of this Supplement. A summary of the Draft Solar PEIS visual contrast analysis for the proposed Los Mogotes East SEZ is provided in Table C.3.4-2. This table includes only the resources that would be subject to moderate or strong visual contrast. The Draft Solar PEIS visual impact analysis predicted these levels of visual contrast from solar energy development in the Los Mogotes East SEZ for the following sensitive visual resource areas (SVRAs) and sensitive viewing locations (SVLs):

- San Luis Hills WSA
- Los Caminos Antiguos Scenic Highway
- San Luis Hills ACEC
- Communities of La Jara, Romeo, Sanford, and Manassa
- West Fork of the North Branch of the Old Spanish Trail.

The following steps could be taken to better understand potential impacts on these SVRAs and SVLs from solar development in the Los Mogotes East SEZ:

- Identify key observation points (KOPs) within these areas through working with the management agency or other local stakeholders.
- Conduct viewshed analyses from the KOPs to determine how much of the SEZ would be in view from each KOP.
- As deemed necessary, based on viewshed analysis results, prepare wireframe Google Earth™ visualizations of hypothetical solar facilities in the SEZ depicting the 80% development scenario to better estimate potential impacts.

This additional analysis may help judge potential visual contrast more accurately for most KOPs. For KOPs of particularly high sensitivity, a site visit with photography and superimposition of the wireframe models onto the photos might be required or desired.

Additional required mitigation measures to address potential visual resource impacts are given in Section C.7.3 of this appendix.

C.3.4.5.12 Acoustic Environment

None.

TABLE C.3.4-2 Summary of Potential Visual Impacts on SVRAs and SVLs within the 25-mi (40-km) Viewshed of the Proposed Los Mogotes East SEZ

Management Area Category	SVRA/SVL within 25 mi[a] of SEZ	Total Acreage/ Mileage[a,b,c] of SVRA/SVL	Distance from SEZ at Point of Closest Approach[d]	Total Acreage/Mileage Visible within 25 mi	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes[f]
WSAs	San Luis Hills	10,896 acres	8.8 mi east–southeast of the SEZ	3,311 acres	30.4	Solar energy development would be expected to create weak to moderate visual contrasts; contrast levels would be highest at high-elevation viewpoints in the western part of the WSA, and lower for low-elevation viewpoints such as in canyons or on bajadas. Visible areas within the WSA extend from approximately 8.8 mi to approximately 13 mi .from the eastern boundary of the SEZ
ACECs Designated for Outstanding Scenic Values	San Luis Hills	39,421 acres	9.4 mi east of the SEZ	15,610 acres	39.6	Range of visual contrasts would be dependent on viewer location and project locations and the projects' characteristics. Solar energy facilities would be expected to attract attention but would not be likely to dominate views and would be expected to create weak to moderate visual contrasts. Contrast levels would be highest at high-elevation viewpoints in the western part of the ACEC and lower for low-elevation viewpoints, such as in canyons or on bajadas.

TABLE C.3.4-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi[a] of SEZ	Total Acreage/ Mileage[a,b,c] of SVRA/SVL	Distance from SEZ at Point of Closest Approach[d]	Total Acreage/Mileage Visible within 25 mi	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes
Scenic Highways/ Byways	Los Caminos Antiguos[g]	129 mi	2.6 mi east–southeast of the southeast corner of the SEZ	27.1 mi	21.0	Solar energy development would be expected to create weak to strong visual contrasts, depending on viewer location and other visibility factors. Other features screen many views of the SEZ. The byway runs through the San Luis Valley and is located in close proximity to several of the proposed SEZs.
Other Areas of Interest (non-management areas)	West Fork of the North Branch of the Old Spanish Trail[h]	1,200 mi	1.0 mi from the SEZ	54.0 mi	4.5	Where screening is absent, because of the short distance, strong visual contrasts could be observed by trail users near the point of closest approach. Minimal to strong visual contrasts could be observed from points on the trail farther from the SEZ
	La Jara[i]	224 acres	5.3 mi northeast of the proposed SEZ	NA[j]	NA	Moderate levels of visual contrast would be expected. A detailed future site-specific National Environmental Policy Act (NEPA) analysis is required to determine visibility precisely.
	Romeo	NA	3.0 mi east of the proposed SEZ	NA	NA	Where screening is absent, Romeo could experience strong visual contrasts. A detailed future site-specific NEPA analysis is required to determine visibility precisely.

TABLE C.3.4-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi[a] of SEZ	Total Acreage/ Mileage[a,b,c] of SVRA/SVL	Distance from SEZ at Point of Closest Approach[d]	Total Acreage/Mileage Visible within 25 mi	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes
Other Areas of Interest (non-management areas)	Sanford[i]	902 acres	7.7 mi (12.4 km) east northeast of the SEZ	NA	NA	Moderate to strong visual contrasts would be expected where there are unobstructed views to the SEZ. A detailed future site-specific NEPA analysis is required to determine visibility precisely.
	Manassa[j]	602 acres	5.5 mi east of the SEZ	NA	NA	Where screening was absent, the SEZ could potentially stretch across much of the field of view; expected contrast levels would be strong where there are unobstructed views to the SEZ. A detailed future site-specific NEPA analysis is required to determine visibility precisely.

[a] To convert mi to km, multiply by 1.609.

[b] To convert acres to km^2, multiply by 0.004047.

[c] Mileage (within all columns) is used only for trails or roads, unless otherwise specified.

[d] Distances at the point of closest approach are based on the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries would result in changes to these calculations.

[e] The total acreage/mileage visible within 25 mi (40 km) of the SEZ is based on the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries would result in changes to these acreages/mileages, as well as the percent total acreages/mileages visible within 25 mi (40 km) of the SEZ.

[f] The assessment of impacts is based the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries may result in reduced impacts in some of the SVRAs/SVLs due to the reduction in the overall footprint of the SEZ.

[g] Length of byway: America's Byways (2011a).

[h] Length of Continental Divide trail managed by the BLM: BLM (2010).

[i] Acreage of Colorado towns: U.S. Bureau of the Census (2011a).

[j] NA = data not available.

C.3.4.5.13 Paleontological Resources

The potential for impacts on paleontological resources is low in 73% of the SEZ, where the Potential Fossil Yield Classification (PFYC) has been identified as Class 1 in the Draft Solar PEIS. Approximately 27% (718 acres [2.9 km^2]) of the SEZ, along the eastern edge is classified as Class 4/5. The depth of the Alamosa Formation would need to be determined in that area, and the remainder of the SEZ would need to be field-checked to verify the PFYC classification of Class 1.

The BLM Regional Paleontologist will be contacted to determine whether additional information is available regarding the paleontological potential of the SEZ.

C.3.4.5.14 Cultural Resources and Native American Concerns

None of the proposed Los Mogotes East SEZ has been systematically surveyed, and consequently no sites have been recorded in the original footprint of the SEZ. About 144 sites (including isolated finds) have been recorded within 5 mi (8 km) of the SEZ. Many significant archaeological sites are recorded just west of the SEZ, which is one of the reasons the size of the original SEZ has been reduced. Paleoindian sites could be encountered throughout the San Luis Valley. Traditional cultural properties of significance to the Hispanic community also may be present in the vicinity of the SEZ. The West Fork of the North Branch of the Old Spanish Trail proceeds close to the eastern boundary of the SEZ. Visual and auditory impacts are possible on the trail and also on Blanca Peak, a sacred mountain of the Navajo that is northeast of the SEZ. Impacts on the visual integrity of the Cumbres and Toltec Scenic Railroad are possible, but the technology limitation described in Section 3.4.3 is expected to significantly reduce such impacts. The destruction and degradation of important plant resources and the destruction of habitat or impediments to the movement of culturally important wildlife are also potential impacts of concern within the SEZ.

The following additional data collection efforts could reduce the uncertainty about potential impacts on cultural resources:

- Conduct a Class I literature file search to better understand (1) the site distribution pattern in the vicinity of the SEZ, (2) trail networks through existing ethnographic reports, and (3) overall cultural sensitivity of the landscape

- Conduct a Class II Stratified Random Sample Survey of the SEZ to obtain a 10% sample (roughly 265 acres [1.1 km^2]). Areas of interest, as determined through a Class I review, should also be identified prior to establishing the survey design and sampling strategy.

- Prepare a cultural sensitivity map based on the results of the Class II survey and Class I review.

- Identify the integrity and historical significance of the portion of the West Fork of the North Branch of the Old Spanish Trail in the vicinity of the SEZ, and conduct viewshed analyses from key points along the trail. If this portion of the trail is determined significant, a mitigation strategy would need to be developed to address unavoidable impacts on the trail.

- Continue with government-to-government consultation, as described in Section 2.4.3, including follow-up to recent ethnographic studies covering some SEZs in Nevada and Utah with Tribes not included in the original studies to determine whether those Tribes have similar concerns. The Los Mogotes East SEZ area was used by Tribes historically for hunting and trading rather than long-term settlement. The Ute, Jicarilla Apache, Navajo, Kiowa, Comanche, Arapaho, Pueblo groups and Cheyenne may all have traditional interests in the valley. Potentially significant sites and landscapes for the Navajo, Upper Rio Grande Pueblo (Tewa), and Taos Pueblo are present in the San Luis Valley (Blanca Peak, Great Sand Dunes, and San Luis Lakes). Potential topics to be discussed during consultation include the above mentioned places, trail systems, mountain springs and other water sources, mineral resources, burial sites, ceremonial areas, and plant and animal resources. An ethnographic study of the SEZs in the San Luis Valley is currently proposed; results of the study will be incorporated into the Final Solar PEIS, if available at the time of publication.

C.3.4.5.15 Socioeconomics and Environmental Justice

None.

C.3.4.5.16 Cumulative Impact Considerations

None.

C.4 NEVADA PROPOSED SOLAR ENERGY ZONES

C.4.1 Amargosa Valley

C.4.1.1 Summary of Potential Impacts Identified in the Draft Solar Programmatic Environmental Impact Statement (PEIS)

The proposed Amargosa Valley solar energy zone (SEZ), as presented in the Draft Solar PEIS, had a total area of 31,625 acres (128 km^2). It is located in Nye County in southern Nevada near the California border (Figure C.4.1-1). The towns of Beatty and Amargosa Valley are located about 11 mi (18 km) north of, and 12 mi (20 km) southeast of, the SEZ respectively.

The Draft Solar PEIS identified a 138-kV transmission line adjacent to the proposed Amargosa Valley SEZ as the nearest point for connection of the SEZ to the grid. The actual location of connection to the transmission grid could be different than that assumed in the Draft Solar PEIS. Details on the updated transmission impact assessment for SEZs to be included in the Final Solar PEIS are provided in Section C.7.1 of this appendix. Analysis of transmission lines and/or access roads will be completed, as necessary, as part of the project-specific environmental reviews (see Section 2.2.2.2.2 of this Supplement).

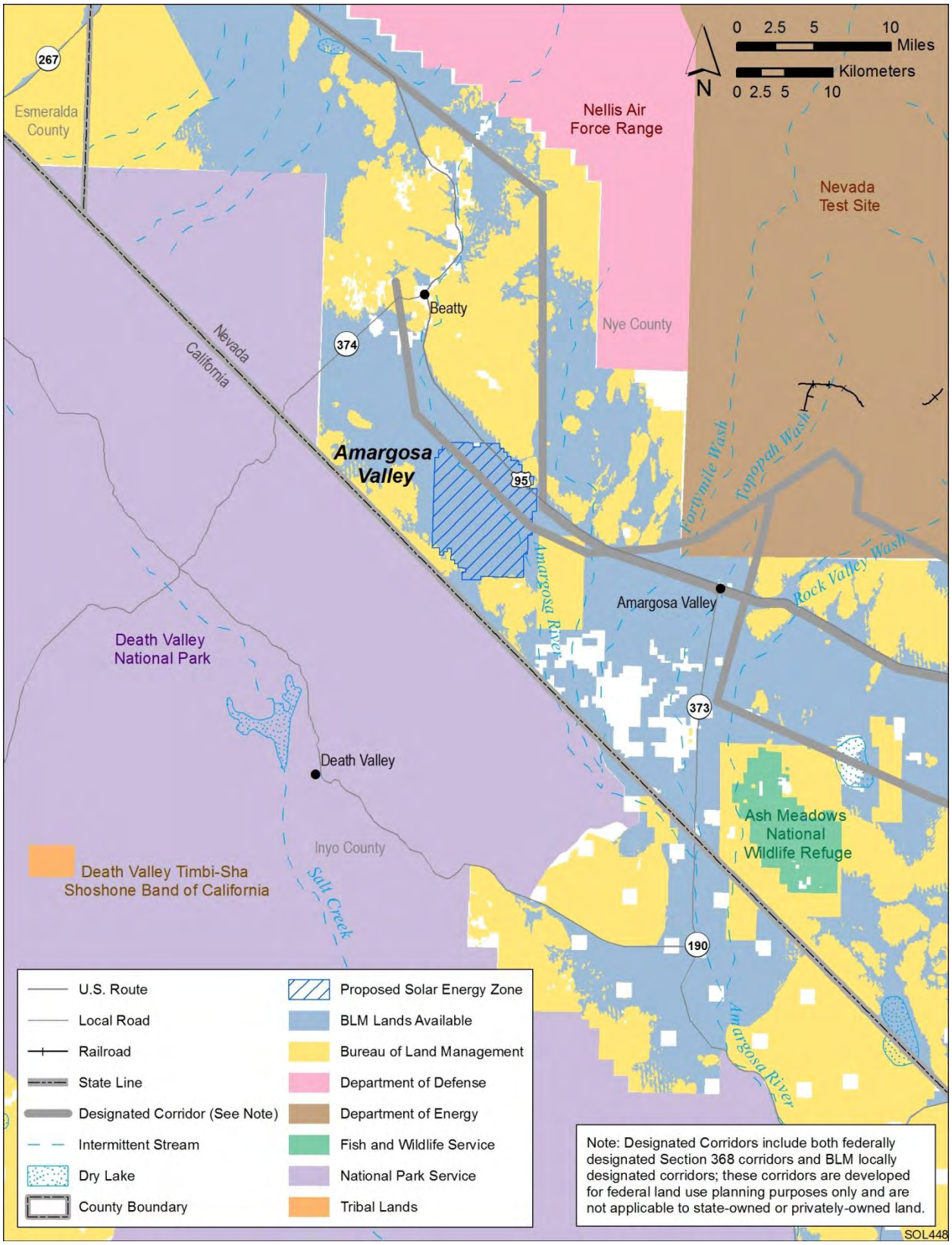
Potential adverse impacts identified in the Draft Solar PEIS included the following:

- Travel on existing dirt roads and in dry washes would be disrupted, resulting in the creation of isolated parcels of public land between the SEZ and the Death Valley National Park (NP) boundary.

- Wilderness characteristics on 19,406 acres (78.5 km^2) of designated wilderness within the Death Valley NP would be adversely affected. Night sky viewing from the National Park could be impaired. Additional groundwater withdrawals could adversely affect portions of the Death Valley NP, the National Wildlife Refuge (NWR), and three Areas of Critical Environmental Concern (ACECs) that are dependent on maintaining current water levels.

- Recreation use would be eliminated from portions of the SEZ that would be developed for solar energy production. There would be an impact on the existing off-highway vehicle (OHV) use in the area, but the magnitude is not known. Portions of an approved desert racing and commercial tour route would be lost. Access to public land and National Park Service (NPS) areas south and west of the SEZ would be lost, or, at a minimum, made much more difficult by development of the SEZ.

- The U.S. Department of Defense (DoD) expressed serious concern over solar energy facilities being constructed within the SEZ, and Nellis Air Force Base



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2 **FIGURE C.4.1-1 Proposed Amargosa Valley SEZ as Presented in the Draft Solar PEIS**

indicated that any facilities higher than 50 ft (15 m) may be incompatible with low-level aircraft use of the military training route (MTR). Further, the Nevada Test and Training Range (NTTR) indicated that solar technologies requiring structures higher than 50 ft (15 m) above ground level may present unacceptable electromagnetic compatibility concerns for their test mission.

- Impacts on soil resources (e.g., soil compaction, soil horizon mixing, soil erosion by wind and runoff, sedimentation, and soil contamination) could occur.

- Groundwater use would deplete the aquifer to the extent that, at a minimum, wet-cooling options would not be feasible.

- Clearing of a large portion of the proposed SEZ could primarily affect creosote-white bursage desert scrub, and may adversely affect desert dry washes and playa habitats, depending on the amount of habitat disturbed. The establishment of noxious weeds could result in habitat degradation. Deposition of fugitive dust could cause reduced productivity or changes in plant community structure.

- Potentially suitable habitat for 52 special status species and more than 75 wildlife species occurs in the affected area of the proposed SEZ; up to 2.0% of the potentially suitable habitat for any of these species occurs in the region that would be directly affected by development.

- If aquatic biota are present in the Amargosa River, they could be could be indirectly affected by a decline in habitat quantity and quality due to water withdrawals and changes in drainage patterns, as well as increased sediment and contaminant inputs associated with ground disturbance and construction activities.

- Temporary exceedances of ambient air quality standards for particulate matter at the SEZ boundaries are possible during construction. These high concentrations, however, would be limited to the immediate area surrounding the SEZ boundary. Modeling indicates that emissions from construction activities could exceed Class I PSD Prevention of Significant Deterioration (PSD) PM_{10} (particulate matter with an aerodynamic diameter of 10 μm or less) increments at the nearest federal Class I area (John Muir Wilderness Area [WA]).

- Strong visual contrasts could be observed by visitors to the Big Dune special recreation management area (SRMA) and travelers on U.S. 95. Weak to strong visual contrasts could be observed by visitors to the California Desert Conservation Area (CDCA) and Death Valley NP and WA. Weak to moderate visual contrasts could be observed by travelers on State Route 374.

- Few, if any, impacts on significant paleontological resources are likely to occur within the SEZ. Direct impacts on significant cultural resources could occur; at least four sites have been recorded within the proposed SEZ, and at least one of them is considered potentially eligible for listing in the *National Register of Historic Places* (NRHP). It is possible that Native American concerns will be expressed over potential visual and other effects of solar energy development within the SEZ on specific resources and culturally important landscapes.

- On an individual census block group basis, there are low-income and minority populations within a 50-mi (80-km) radius of the proposed SEZ boundary, so adverse impacts of solar development could disproportionately affect low-income and minority populations.

C.4.1.2 Summary of Comments Received

Some comments received on the proposed Amargosa Valley SEZ were in favor of identifying the area as an SEZ, provided that specific concerns are addressed in the Final Solar PEIS (e.g., Nevada Wilderness Project, The Wilderness Society et al.[17]). Many commentors, however, opposed designating the area as an SEZ because of the potential negative impact on Death Valley wilderness and water resources and endangered desert species, including the Devil's Hole pupfish. Other commentors recommended that Amargosa Valley be reduced or reconfigured to avoid potential impacts. The Nevada Wilderness Project, Wilderness Society, and others suggested a boundary adjustment to avoid the 100-year flood channel and the secondary wash that is tributary to the Amargosa River, including a buffer to avoid potential impacts on wildlife and plant habitat, for flood control, and the preservation of hydrologic function. The National Parks Conservation Association recommended that the SEZ be moved to an area further from Death Valley NP to avoid impacts on special status species and important water resources.

The U.S. Fish and Wildlife Service (USFWS) recommended that the SEZ area be reconfigured to address potential impacts on groundwater-dependent species, a national wildlife refuge, and desert tortoise. The Nevada Department of Wildlife (NDOW) recommended that the portion of the SEZ to the northeast of U.S. 95 be eliminated.

Concerns were expressed over potential impacts of groundwater withdrawals on the Ash Meadows National Wildlife Refuge (NWR), Devil's Hole, and the Amargosa Mesquite Trees ACEC (Western Watersheds Project, Amargosa Conservancy). The U.S. Environmental Protection Agency (EPA) suggested eliminating the SEZ or restricting technologies to those that use the least amount of water, such as photovoltaic (PV). The Nature Conservancy supported the

[17] The Wilderness Society, Center for Biological Diversity, Defenders of Wildlife, Sierra Club—Toiyabe Chapter, National Parks Conservation Association, Natural Resources Defense Council, Soda Mountains Wilderness Council, and Sierra Trek submitted joint comments on the proposed Nevada SEZs. Those comments are attributed to The Wilderness Society et al.

elimination of the Amargosa SEZ, citing the over-allocated groundwater basin, an important corridor for desert tortoise, the potential impact on the Devil's Hole pupfish, and the presence of Big Dune. The Western Watersheds Project opposed the SEZ because of its location within desert tortoise and other special status species habitat and because the region lacks both groundwater and surface water resources. The Amargosa Conservancy was similarly concerned with the over-allocated Amargosa basin and the potential long-term impacts of solar energy development on the SEZ.

The Society for the Protection and Care of Wildlife recommended that impacts on water availability, listed species, and viewshed for the Amargosa Valley SEZ should also be discussed in the Draft Solar PEIS in relation to impacts in California. The DoD was concerned that facilities exceeding 50 ft (15 m) in height could be incompatible with low-level aircraft operations conducted in MTRs, and/or present electromagnetic compatibility concerns, and that glare and heat emissions could present both flight and ground safety concerns. The Pahrump Paiute Tribe opposed solar development in Amargosa Valley because of its proximity to numerous unrecorded archaeological sites, religious sites, songscapes, and storyscapes important to Southern Paiute people and the Pahrump Paiute Tribe. The Tribe also requested ethnographic studies be conducted.

C.4.1.3 Changes to the SEZ

The proposed Amargosa Valley SEZ has been reconfigured to eliminate the area south and west of the Amargosa River floodplain and the area northeast of U.S. 95, a total of 21,888 acres (88.6 km^2) (see Figure C.4.1-2). Excluding these areas will mitigate many potential impacts, including impacts on Death Valley NP and desert tortoise. In addition, 1,258 acres (5.1 km^2) within the SEZ boundaries have been identified as non-development areas. These areas consist of lands within the Amargosa River floodplain that were included in the SEZ only to facilitate definition of the boundaries using the Public Land Survey System. The remaining developable area within the SEZ is 8,479 acres (34.3 km^2).

To reduce the visual resource impacts of solar development within the proposed Amargosa Valley SEZ, SEZ-specific visual resource mitigation requirements were presented in the Draft Solar PEIS. However, the area of the SEZ that was labeled to meet Visual Resource Management (VRM) Class II-consistent objectives in the Draft Solar PEIS has been eliminated from the SEZ.

On the basis of the water impact analysis provided in the Draft Solar PEIS, development within the remaining area of the SEZ may need to be restricted to PV technology or a technology with equivalent or lower water use. Updated analyses taking the revised SEZ boundaries into consideration will be included in the Final Solar PEIS.

Because of the extensive potential impacts from solar development in the portion of the Amargosa Valley SEZ that has been eliminated, those lands will be considered solar right-of-way exclusion areas; that is, applications for solar development on those lands will not be accepted by the U.S. Department of the Interior Bureau of Land Management (BLM).

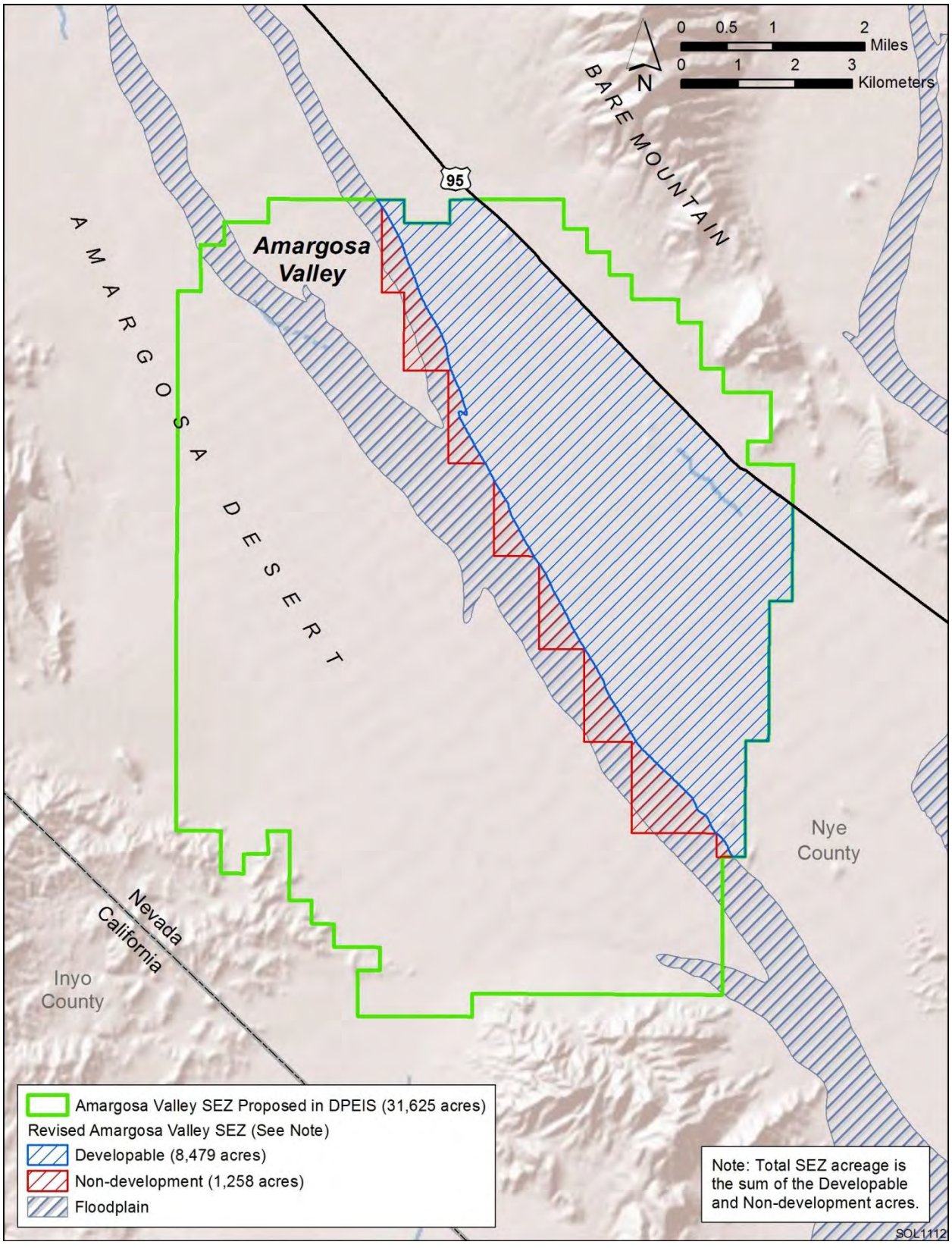

FIGURE C.4.1-2 Proposed Amargosa Valley SEZ as Described in this Supplement

C.4.1.4 Wilderness Character Status of SEZ

A recently maintained inventory of wilderness characteristics was used to determine whether public lands within the Amargosa Valley SEZ have wilderness characteristics. The finding of this inventory was that these lands do not contain wilderness characteristics.

C.4.1.5 Additional Data Collection Recommended

C.4.1.5.1 Lands and Realty

None.

C.4.1.5.2 Specially Designated Areas and Lands with Wilderness Characteristics

The potential impact on wilderness characteristics will be re-evaluated based on the revised boundaries of the proposed Amargosa Valley SEZ.

C.4.1.5.3 Rangeland Resources

Livestock Grazing. None.

Wild Horses and Burros. None.

C.4.1.5.4 Recreation

The potential impacts on recreation use, including OHV, desert racing, and commercial tour use, will be re-evaluated based on the revised boundaries of the of the proposed Amargosa Valley SEZ.

C.4.1.5.5 Military and Civilian Aviation

The DoD has expressed continued concern regarding the potential impact of solar development in this SEZ on military operations. The proposed technology restrictions described in Sections C.4.1.3 and C.7.3 are expected to minimize or eliminate any potential issues with military operations; however, the BLM will continue to consult with the DoD regarding potential issues with MTRs.

C.4.1.5.6 Geologic Setting and Soil Resources

None.

C.4.1.5.7 Minerals

Additional information on leasable and strategic minerals in the vicinity of the proposed SEZ will be provided in the Final Solar PEIS to inform the Department of the Interior's decision on a proposed 20-year withdrawal of SEZ lands.

C.4.1.5.8 Water Resources

The following additional data and actions would help further characterize potential impacts on water resources for the proposed Amargosa Valley SEZ. A more detailed discussion of each of these activities is included in the water resources action plan provided in Section C.7.2 of this appendix.

- Prepare a planning-level water resources inventory of the Amargosa Valley basin.

- Identify additional ephemeral stream channels for non-development areas through consultation with the Nevada BLM, Nevada Division of Water Resources (NDWR), EPA, and U.S. Army Corps of Engineers (USACE) with a focus on:
  - Unnamed ephemeral streams flowing northwest to southeast across SEZ
  - Distributary channels of Amargosa River within the SEZ

- Conduct a field survey to:
  - Survey ephemeral stream channels and distributary channels of the Amargosa River for surface elevations, high water marks, and sediment conditions.

- Coordinate with the USACE (Sacramento District) regarding jurisdictional water determinations for the SEZ. Water features to be considered include:
  - Channels feeding into the Amargosa River

- Describe the formation of a stakeholder committee to conduct long-term monitoring of water resources. This activity would entail:
  - Identifying key stakeholder agencies,
  - Discussing general features of a monitoring program, and
  - Working with U.S. Geological Survey (USGS) to develop groundwater monitoring well design and numerical groundwater models.

- Perform groundwater modeling analyses for the Amargosa Valley in the region of the SEZ to estimate potential impacts of full build-out groundwater pumping scenarios (according to estimated, technology-specific water requirements).Tasks include:
  - Develop superposition-type groundwater model and modify the regional-scale Death Valley Regional Flow System (DVRFS) model,
  - Coordinate with USGS-NV regarding modeling analyses and use of DVRFS model, and
  - Address potential impacts on groundwater relevant to Ash Meadows National Wildlife Reserve and Devil's Hole.

C.4.1.5.9 Ecological Resources

Vegetation and Plant Communities. The following additional data-gathering actions would help further characterize potential impacts on vegetation and plant communities for the proposed Amargosa Valley SEZ:

- Identify and map the location and areal extent of desert dry washes and playa habitats within the SEZ. Identify and map the location and areal extent of these habitats, as well as wetland, riparian, greasewood flat, desert chenopod scrub, and mesquite bosque habitats, and Amargosa River shrub communities, outside the SEZ that may be affected by hydrologic changes, including groundwater elevations, and changes in water, sediment, and contaminant inputs associated with runoff. Such efforts could help determine habitat characteristics, including water source, hydrologic regime, and dominant plant species.

- Identify and map the location of cactus species within the SEZ.

Wildlife. The following additional data-gathering actions would help further characterize potential impacts on wildlife resources for the SEZ:

- Conduct pre-disturbance surveys within the SEZ to determine the use of the SEZ as movement/migratory corridor or as important habitat for the mule deer.

- Identify and map the location, areal extent, and wildlife use of intermittent stream habitat (Amargosa River) within the SEZ. These areas provide important habitat for a number of wildlife species.

Aquatic Biota. Investigations recommended under the water resources action plan (Section C.4.1.5.8) would be useful in characterizing and protecting habitat available to aquatic

biota. The Amargosa River floodplain likely contains aquatic biota and has been designated a non-development area. Therefore, a preliminary evaluation of that area is not necessary. However, if it is determined that the Amargosa River or its floodplain could be affected indirectly by water withdrawals, changes in drainage patterns, and construction activities, the potential for aquatic communities to be affected in these areas would require further investigation prior to development.

Special Status Species. The following additional data-gathering actions would be useful in further characterizing and protecting habitat available to special status species:

- Conduct pre-disturbance surveys within the SEZ to determine the presence and abundance of those special status species that are (1) federally listed, proposed for listing, candidates for listing, or under review for listing under the Endangered Species Act; or (2) protected by the State of Nevada; or (3) designated as sensitive by the Nevada BLM State Office. These species are listed in Table C.4.1-1. Surveys should focus on areas identified as potentially suitable, and the suitability of these habitats to support these special status species should be determined in the field. All field-determined suitable habitats for special status species should be mapped. Target species and survey protocols should be developed in coordination with the USFWS and NDOW.

  The Draft Solar PEIS presents a table of special status species for which potential impacts need to be evaluated prior to development in the proposed Amargosa SEZ. The list of species presented in Table 11.1.12.1-1 of the Draft Solar PEIS also includes species listed by the State of Nevada and species ranked by the States of California or Nevada as S1 or S2, or species of concern by the states of California or Nevada. On the basis of the design features presented in the Draft Solar PEIS, the potential for impacts on these additional species will also need to be addressed before development could occur in the SEZ.

- Identify and map the location and areal extent of desert wash or riparian habitats within the SEZ. The suitability of these habitats for special status species should be determined. Species potentially associated with these habitats include the Holmgren lupine, Amargosa toad, phainopepla, and western small-footed myotis.

- Identify and map the location and areal extent of woodland habitats within the SEZ. The suitability of these habitats for special status species should be determined. Species potentially associated with these habitats include the ferruginous hawk, phainopepla, fringed myotis, pallid bat, spotted bat, and western small-footed myotis.

TABLE C.4.1-1 Special Status Species That May Occur in the Vicinity of the Proposed Amargosa Valley SEZ[a]

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Plants			
Death Valley beardtongue	*Penstemon fruticiformis* ssp. *amargosae*	BLM-S	Known only from the Death Valley region of California and southern Nevada. It inhabits Mojave desert scrub communities at elevations between 2,800 and 4,600 ft.[d] Nearest recorded occurrence is approximately 13 mi[e] east of the SEZ. About 2,424,000 acres[f] of potentially suitable habitat occurs within the SEZ region.
Holmgren lupine	*Lupinus holmgrenianus*	BLM-S	Known only from the Death Valley region of California and southern Nevada. It inhabits dry desert slopes, washes, and valleys on volcanic substrates, sometimes in association with pinyon-juniper woodlands. The species occurs at elevations between 4,600 and 8,200 ft. Nearest recorded occurrence is from the Death Valley NP, approximately 15 mi northwest of the SEZ. About 132,350 acres of potentially suitable habitat occurs within the SEZ region.
White-margined beardtongue	*Penstemon albomarginatus*	BLM-S	Inhabits desert sand dune habitats and Mojave desert scrub communities at elevations below 3,600 ft. Nearest recorded occurrence is approximately 17 mi east of the SEZ. About 2,464,200 acres of potentially suitable habitat occurs within the SEZ region.
Amphibians			
Amargosa toad	*Bufo nelsoni*	ESA-UR; BLM-S; NV-P	Endemic to the Amargosa Valley in Nye County, Nevada, where it is confined to isolated riparian and spring-fed habitats along the Amargosa River. Usually observed near water at the outflow of warm springs. Nearest recorded occurrence is approximately 8 mi north of the SEZ in the vicinity of Beatty, Nevada. About 24,600 acres of potentially suitable habitat occurs within the SEZ region.
Reptiles			
Desert tortoise[g]	*Gopherus agassizii*	ESA-T; NV-P	Desert creosotebush communities on firm soils for digging burrows. Often found along riverbanks, washes, canyon bottoms, creosote flats, and desert oases. Known to occur on the SEZ. About 2,717,800 acres of potentially suitable habitat occurs within the SEZ region.
Birds			
Ferruginous hawk	*Buteo regalis*	BLM-S	Winter resident in the SEZ region. Forages in grasslands, shrublands, agricultural lands, and the periphery of pinyon-juniper forests. Known to occur in Nye County, Nevada. About 1,239,000 acres of potentially suitable habitat occurs within the SEZ region.
Phainopepla	*Phainopepla nitens*	BLM-S; NV-P	Desert scrub, mesquite, and pinyon-juniper woodland communities. Also occurs in desert riparian areas and orchards. Nests in trees or shrubs in riparian habitats from 3 to 45 ft above the ground. About 1,369,100 acres of potentially suitable habitat occurs within the SEZ region.

TABLE C.4.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Birds (Cont.)			
Prairie falcon	*Falco mexicanus*	BLM-S	Year-round resident in the SEZ region, primarily in open habitats in mountainous areas, steppe, grasslands, or cultivated areas. Typically nests in well-sheltered ledges of rocky cliffs and outcrops. About 2,338,500 acres of potentially suitable habitat occurs within the SEZ region.
Western burrowing owl	*Athene cunicularia hypugaea*	BLM-S	Open grasslands and prairies, as well as disturbed sites such as golf courses, cemeteries, and airports. Nests in burrows constructed by mammals (prairie dog, badger, etc.). About 4,559,600 acres of potentially suitable habitat occurs within the SEZ region.
Mammals			
Fringed myotis	*Myotis thysanodes*	BLM-S; NV-P	Year-round resident in the SEZ region in a wide range of habitats including lowland riparian, desert shrub, pinyon-juniper, and sagebrush habitats. Roosts in buildings and caves. Nearest recorded occurrence is from the DOE Nevada Test Site, approximately 13 mi east of the SEZ. About 3,348,000 acres of potentially suitable habitat occurs within the SEZ region.
Nelson's bighorn sheep	*Ovis canadensis nelsoni*	BLM-S	Open, steep rocky terrain in mountainous habitats of the eastern Mojave Desert. Rarely uses desert lowlands, but may use them as corridors for travel between mountain ranges. Nearest recorded occurrence is from the Funeral Mountains, approximately 2 mi southwest of the SEZ. About 2,343,300 acres of potentially suitable habitat occurs within the SEZ region.
Pallid bat	*Antrozous pallidus*	BLM-S; NV-P	Year-round resident in the SEZ region in low-elevation desert communities, including grasslands, shrublands, and woodlands. Roosts in caves, crevices, and mines. Nearest recorded occurrence is from the DOE Nevada Test Site, approximately 13 mi east of the SEZ. About 3,500,600 acres of potentially suitable habitat occurs within the SEZ region.
Spotted bat	*Euderma maculatum*	BLM-S; NV-P	Year-round resident in the SEZ region near forests and shrubland habitats throughout the SEZ region. Roosts and hibernates in caves and rock crevices. About 2,955,200 acres of potentially suitable habitat occurs within the SEZ region.
Townsend's big-eared bat	*Corynorhinus townsendii*	BLM-S; NV-P	Year-round resident in the SEZ region in all but subalpine and alpine habitats, and may be found at any season throughout its range. Roosts in caves, mines, tunnels, buildings, or other man-made structures. Nearest recorded occurrence is approximately 12 mi north of the SEZ. About 3,739,000 acres of potentially suitable habitat occurs within the SEZ region.

TABLE C.4.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Mammals (Cont.)			
Western small-footed myotis	*Myotis ciliolabrum*	BLM-S	Year-round resident in the SEZ region in a variety of woodlands and riparian habitats at elevations below 9,000 ft. Roosts in caves, buildings, mines, and crevices of cliff faces. Nearest recorded occurrence is from the DOE Nevada Test Site, approximately 13 mi east of the SEZ. About 4,194,700 acres of potentially suitable habitat occurs within the SEZ region.

[a] The listings for (1) federally listed, proposed for listing, or candidates for listing under the ESA, and (2) Nevada BLM State Office sensitive species have been updated since the release of the Draft Solar PEIS.

[b] BLM-S = listed as a sensitive species by the BLM; ESA-T = listed as threatened under the ESA; ESA-UR = under review for listing under the ESA; NV-P = protected by the State of Nevada.

[c] For plant species, potentially suitable habitat was determined by using Southwest Regional Gap Analysis (SWReGAP) land cover types (USGS 2005). For terrestrial vertebrate species, potentially suitable habitat was determined by using SWReGAP habitat suitability and land cover models. Area of potentially suitable habitat for each species is presented for the SEZ region, which is defined as the area within 50 mi (80 km) of the SEZ center.

[d] To convert ft to m, multiply by 0.3048.

[e] To convert mi to km, multiply by 1.609.

[f] To convert acres to km^2, multiply by 0.004047.

[g] Species in bold text have been recorded or have designated critical habitat in the affected area.

C.4.1.5.10 Air Quality and Climate

None.

C.4.1.5.11 Visual Resources

Visual resources will be re-evaluated for the Final Solar PEIS based on the boundary adjustments and proposed technology restrictions described in Section C.4.1.3 of this Supplement. A summary of the Draft Solar PEIS visual contrast analysis for the proposed Amargosa Valley SEZ is provided in Table C.4.1-2. This table includes only those resources that would be subject to moderate or strong visual contrast. The Draft Solar PEIS visual impact analysis predicted these levels of visual contrast from solar energy development in the Amargosa Valley SEZ for the following sensitive visual resource areas (SVRAs) and sensitive viewing locations (SVLs):

- Death Valley NP
- Death Valley WA

TABLE C.4.1-2 Summary of Potential Visual Impacts on SVRAs and SVLs within the 25-mi (40-mi) Viewshed of the Proposed Amargosa Valley SEZ

Management Area Category	SVRA/SVL within 25 mi[a] of SEZ	Total Acreage/ Mileage[a,b,c] of SVRA/SVL	Distance from SEZ at Point of Closest Approach[d]	Total Acreage/Mileage Visible within 25 mi[e]	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes[f]
NP	Death Valley	3,397,062 acres	0.7 mi southwest to west of the SEZ	105,519 acres	3.1	Strong visual contrasts would be likely to occur where clear views of the SEZ exist, even beyond the 5 mi limit of the foreground-middle ground zone. There would be very limited visibility from higher elevations on Tucki Mountain and in the Panamint Range, but because of topographic screening and the long distance to the SEZ, expected visual contrasts would be weak. Potential visibility of solar facilities extends beyond 25 mi from the southwestern boundary of the SEZ
WAs	Death Valley	3,074,256 acres	0.7 mi southwest of the SEZ	67,944 acres	2.2	Same as for the Death Valley NP
SRMA	Big Dune	11,572 acres	0.4 mi east of the SEZ	11,198 acres	96.8	Strong levels of visual contrast would be expected in areas with a clear view of the SEZ; contrast would be slightly weaker from viewpoints in the southeastern portion of the SRMA, because the distance to the SEZ is greater.
Other Areas of Interest (non-management areas)	U.S. 95[g]	1,574 mi	Passes through the northeast corner of the SEZ	31 mi	2.0	Solar facilities would strongly command visual attention and would likely dominate views from some locations along the roadway.

Footnotes on next page.

TABLE C.4.1-2 (Cont.)

[a] To convert mi to km, multiply by 1.609.

[b] To convert acres to km^2, multiply by 0.004047.

[c] Mileage (within all columns) is used only for trails or roads, unless otherwise specified.

[d] Distances at the point of closest approach are based on the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries would result in changes to these calculations.

[e] The total acreage/mileage visible within 25 mi (40 km) of the SEZ is based on the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries would result in changes to these acreages/mileages, as well as the percentage of total acreage/mileage visible within 25 mi (40 km) of the SEZ.

[f] The assessment of impacts is based the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries may result in reduced impacts in some of the SVRAs/SVLs due to the reduction in the overall footprint of the SEZ.

[g] Length of U.S. 95: US-Highways.com (2010).

- Big Dune SRMA

- U.S. 95.

The following steps could be taken to better understand potential impacts on these SVRAs and SVLs from solar development in the Amargosa Valley SEZ:

- Identify key observation points (KOPs) within these areas through working with the management agency or other local stakeholders.

- Conduct viewshed analyses from the KOPs to determine how much of the SEZ would be in view from each KOP.

- As deemed necessary, based on viewshed analysis results, prepare wireframe Google Earth™ visualizations of hypothetical solar facilities in the SEZ depicting the 80% development scenario to better estimate potential impacts.

This additional analysis may help judge potential visual contrast more accurately for most KOPs. For KOPs of particularly high sensitivity, a site visit with photography and superimposition of the wireframe models onto the photos might be required or desired.

C.4.1.5.12 Acoustic Environment

None.

C.4.1.5.13 Paleontological Resources

The BLM Regional Paleontologist will be contacted to determine whether additional information is available regarding Potential Fossil Yield Classification (PFYC) identifications in Nevada. A preliminary paleontological survey could be conducted to determine the PFYC of the SEZ, in order to update the temporary assignment of PFYC Class 2 used in the Draft Solar PEIS that was based on preliminary field findings during a brief 2010 visit and comparable project area findings nearby.

C.4.1.5.14 Cultural Resources and Native American Concerns

Approximately 3% of the original proposed Amargosa Valley SEZ footprint had been surveyed for cultural resources, identifying four sites within the SEZ. Two of the four sites have been determined not eligible for listing in the *National Register of Historic Places*, one is eligible for listing, and the eligibility of the remaining site is undetermined. For the revised footprint, approximately 1.6% has been surveyed (142 acres [0.6 km^2]), and only one of the four sites are in the revised portion of the SEZ. The site is a railroad siding associated with the Tonopah and Tidewater Railroad; it has been determined not eligible for a lack of integrity. At least 60 sites

have been recorded with 5 mi (8 km) of the original SEZ footprint. As with other SEZs, dune areas and areas along washes have the highest potential for containing significant archaeological resources within the SEZ. Several culturally important areas have also been identified near the SEZ, including specific mountain ranges and peaks, dunes, canyons, trails, and water sources. The destruction or degradation of important water resources and plant resources and the destruction of habitat or impediments to the movement of culturally important wildlife are also potential impacts of concern within the SEZ.

The following additional data collection efforts could reduce the uncertainty about potential impacts on cultural resources:

- Conduct a Class I literature file search to better understand (1) the site distribution pattern in the vicinity of the SEZ, (2) potential trail networks through existing ethnographic reports, and (3) overall cultural sensitivity of the landscape.

- Conduct a Class II reconnaissance level stratified random sample survey of the SEZ to obtain a 10% sample (roughly 878 acres [3.6 km^2]).[18] Areas of interest, such as dune areas and along washes, as determined through a Class I review, should also be identified prior to establishing the survey design and sampling strategy. If appropriate, some subsurface testing of dune areas should be considered in the sampling strategy as well.

- Prepare a cultural sensitivity map based on results of the Class II survey and Class I review.

- Continue with government-to-government consultation as described in Section 2.4.3, including follow-up to recent ethnographic studies with Tribes not included in the original studies to determine whether those Tribes have similar concerns. The Amargosa Valley SEZ falls in the traditional use area of primarily the Western Shoshone and the Southern Paiute, but also of the Owens Valley Paiute. Potential topics presented in the Draft Solar PEIS and/or in an ethnographic study with the Timbisha Shoshone and the Pahrump Paiute to be discussed during consultation include Fortymile Canyon, Bare Mountain, Eagle Mountain, Big Dune, Amargosa River, Ash Meadows, Salt Song and Southern Fox Trails; rock art sites; clay, salt, and pigment sources; water resources;, and plant and animal resources. The agencies value the information shared by the Tribes during the ethnographic study and will consider their input in striving to minimize the impacts of solar development in the SEZ. The completed ethnographic study will be available in its entirety on the Solar PEIS Web site (http://solareis.anl.gov). A summary of the contents of that report is also provided in the following text box.

[18] The BLM plans to conduct a Class II survey of 5% of this SEZ prior to the Final Solar PEIS. Additional areas could be surveyed as funding becomes available.

C.4.1.5.15 Socioeconomics and Environmental Justice

None.

C.4.1.5.16 Cumulative Impact Considerations

None.

Tribal Perspectives on the Significance of the Amargosa Valley SEZ

The lands under consideration in the Amargosa Valley SEZ region were traditionally occupied, used, aboriginally owned, and historically related to the Numic-speaking peoples of the Great Basin and western Colorado Plateau. Tribal representatives involved in Amargosa Valley field consultation summarized here are from the Timbisha Shoshone Tribe, representing the cultural interests of the Western Shoshone, and the Pahrump Paiute Tribe, representing the cultural interests of the Southern Paiutes. These Numic-speaking people have gone on record in past projects and stipulate here again that they are the American Indian people responsible for the cultural resources (natural and man-made) in this study area because their ancestors were placed here by the Creator. According to their traditions, they always have lived in these lands, maintaining and protecting these places, plants, animals, water sources, and cultural signs of their occupation. The involved American Indian Tribal governments and their appointed cultural representatives have participated in this PEIS in order to explain the meaning and cultural centrality of the plants, animals, spiritual trails, healing places, and places of historic encounters that exist in these lands.

Western Shoshone and Southern Paiute Tribal representatives maintain that, in order to understand native people's connections to the SEZ, it must be placed in context with neighboring places and their associated cultural resources. Thus, the significance of the Amargosa Valley SEZ is expressed in terms of the connections between it and places of importance in the surrounding region.

The Amargosa River has been identified by Tribal representatives as being one of most important features in the SEZ region. The river water is an essential life-giving resource for those in the desert. The Amargosa River is connected to Black Mountain, a powerful ceremonial volcanic mountain located to the north of the SEZ region. The river begins at the top of Black Mountain, and the water flows through the volcanic canyons of Thirsty Canyon and through the Amargosa Valley before reaching Death Valley. The power from the mountain follows the flow of water down the mountain and, like the water, flows into Death Valley.

Geologic resources of the Amargosa Valley SEZ region are complex in composition and cultural meanings. These connections have been formed over millions of years, and Numic-speaking peoples have interacted with this landscape for up to 15,000 years. Geologic resources include a range of culturally significant features such as minerals used as paint sources, salts used in curing, quartz deposits used to make tools, volcanic basalt boulders used to hold the prayers of travelers, mountain tops used for vision questing, and fossil evidence of rivers used as mnemonic devices for teaching about the past. All these geologic resources are alive according to the shared epistemology of these Numic-speaking peoples. The Creator made geologic resources alive by placing *Puha* (or energy) in them when the Earth was formed.

The Amargosa Valley SEZ region contains many important geologic features associated with Numic songs, stories, and ceremonies like Eagle Mountain, Devil's Hole Canyon, Fortymile Canyon, the Bare Mountains, and the Amargosa River. One important feature three miles southeast of the SEZ is Big Dune. Tribal representatives stated during ethnographic interviews that Big Dune is featured in traditional stories and songs about this part of Numic territory.

Tribal Perspectives on the Significance of the Amargosa Valley SEZ (*Cont.*)

Eagle Mountain is another important geologic feature located in the Amargosa Valley SEZ region. Southern Paiute and Western Shoshone representatives identified it as being a culturally important place linked to Creation stories and songs.

Western Shoshone and Southern Paiute representatives documented archaeological materials such as pieces of worked obsidian and white chert throughout the Amargosa Valley SEZ region. These artifacts were heavily concentrated on the surface along the Amargosa River bed. Much of the material was heavily weathered with a deep patina, which suggests that it may be thousands of years old. Tribal representatives believe that the artifacts found in the study area serve as physical reminders and connect them to their ancestors who lived on and used this land. Tribal representatives also noted that these artifacts were purposely left in the Amargosa Valley SEZ study area as ritually deposited items. The artifacts are associated with prayer and need to be left in place.

The presence of culturally significant plants and animals contributes to the overall meaning of the Amargosa Valley SEZ study area to Indian people. Numerous species of traditional use plants and animals were identified such as Indian tea, creosote, desert tortoise, and mountain sheep. During multiple field visits, Native American representatives identified 15 traditional use plants and 41 traditionally important animals within the proposed project boundary.

According to Southern Paiute beliefs, Eagle Mountain is located along the Salt Song Trail, an important Southern Paiute spiritual trail. The Salt Songs are performed during the Cry Ceremony, which is conducted to guide the soul of a deceased person to the afterlife (Stoffle et al. 2000a). The location of the spirit person traveling the trail to the afterlife is marked at the end of each set of songs. The living people singing the songs know the spirit person's progress and the song notifies the living that journey to the afterlife has been successful (Stoffle et al. 1997).

1
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C.4.2 Dry Lake

C.4.2.1 Summary of Potential Impacts Identified in the Draft Solar Programmatic Environmental Impact Statement (PEIS)

The proposed Dry Lake solar energy zone (SEZ), as presented in the Draft Solar PEIS, had a total area of 15,649 acres (63 km^2). It is located in Clark County in southern Nevada (Figure C.4.2-1). The towns of Moapa and Overton are about 18 mi (29 km) northeast of, and 23 mi (37 km) east of, the SEZ, respectively.

The Draft Solar PEIS identified three designated transmission corridors that are heavily developed with natural gas, petroleum product, and electric transmission lines (including a 500-kV transmission line) that pass through the proposed SEZ. These corridors could limit development in the SEZ because solar facilities cannot be constructed under transmission lines. The discussion of impacts of solar energy development in the SEZ in the Draft Solar PEIS acknowledged that the presence of these corridors would reduce the amount of land available for solar power production, and that, conversely, full development of solar facilities within the SEZ would limit use of the transmission corridors.

The Draft Solar PEIS identified the 500-kV transmission line passing through the SEZ as the nearest point for connection of the SEZ to the grid. The actual location of connection to the transmission grid could be different than that assumed in the Draft Solar PEIS. Details on the updated transmission impact assessment for SEZs to be included in the Final Solar PEIS are provided in Section C.7.1 of this appendix. Analysis of transmission lines and/or access roads will be completed as necessary as part of the project-specific environmental reviews (see Section 2.2.2.2.2 of this Supplement).

Potential adverse impacts identified in the Draft Solar PEIS included the following:

- Solar development could sever existing roads that cross the SEZ, making it difficult to access public lands within the SEZ that are not developed or those that are outside of the SEZ.

- Wilderness characteristics in up to 3% of the Arrow Canyon and 13% of the Muddy Mountains Wilderness Areas (WAs) could be adversely affected.

- Recreational use would be eliminated from portions of the SEZ that would be developed for solar energy production. Because the SEZ sits astride numerous roads and trails, construction of the solar energy facilities could sever access to undeveloped lands.

- Nellis Air Force Base expressed concern for solar energy facilities that might affect approach and departure from runways on the base. The Nevada Test and Training Range (NTTR) indicated that structures taller than 50 ft (15 m)

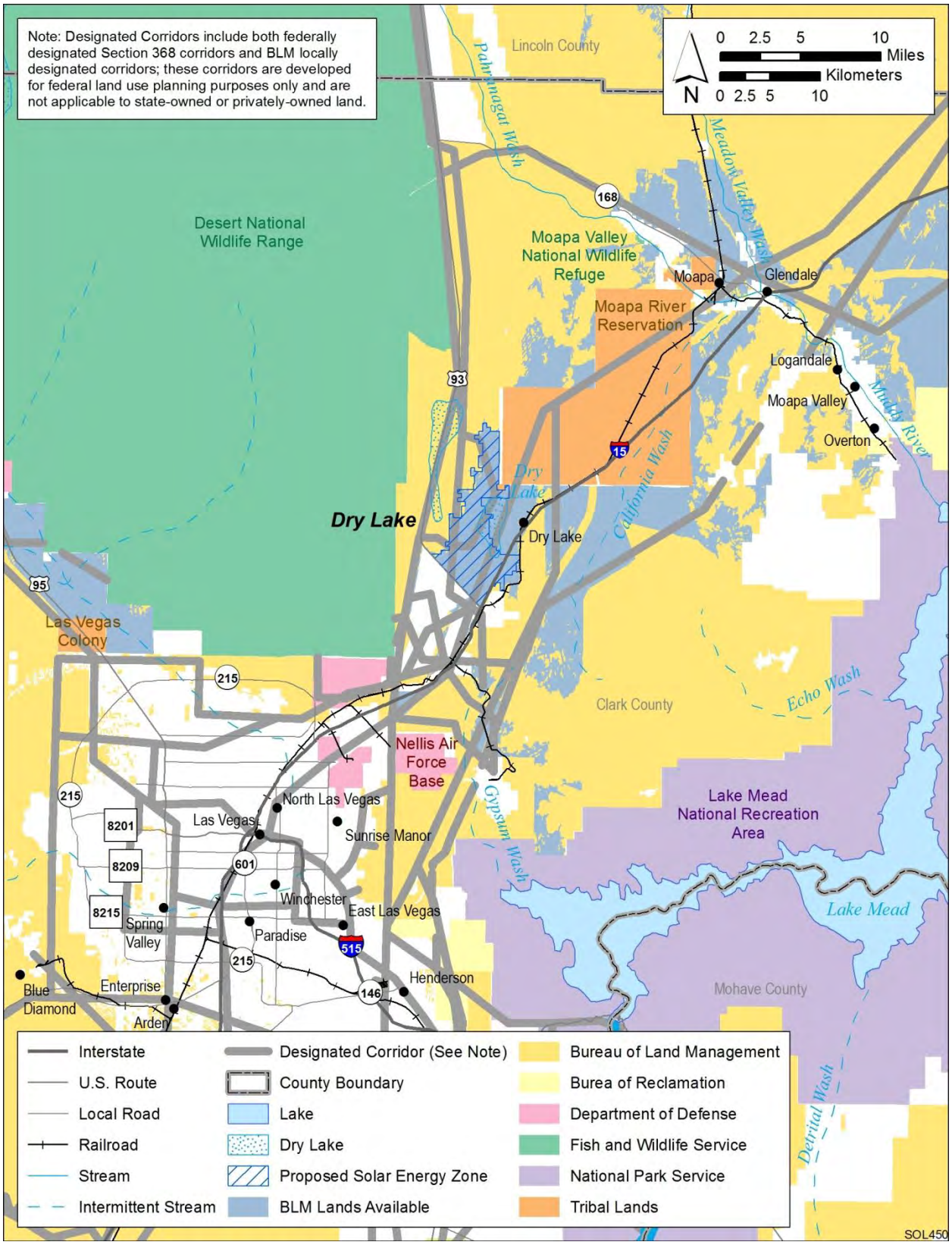

FIGURE C.4.2-1 Proposed Dry Lake SEZ as Presented in the Draft Solar PEIS

may present unacceptable electromagnetic compatibility concerns for the NTTR test mission.

- Groundwater use would deplete the aquifer to the extent that wet-cooling and dry-cooling options would not be feasible.

- Impacts on soil resources (e.g., soil compaction, soil horizon mixing, soil erosion by wind and runoff, sedimentation, and soil contamination) could occur.

- Clearing of a large portion of the proposed SEZ could primarily affect creosote-white bursage desert scrub and may adversely affect desert dry washes, dry wash woodland, desert chenopod scrub, and wetland habitats, depending on the amount of habitat disturbed. The establishment of noxious weeds could result in habitat degradation. Deposition of fugitive dust could cause reduced productivity or changes in plant community structure

- Potentially suitable habitat for 13 special status species and more than 90 wildlife species occurs in the affected area of the proposed SEZ; less than 1.0% of the potentially suitable habitat for any of these species occurs in the region that would be directly affected by development.

- If aquatic biota exist within dry lake wetlands and unnamed washes, they could be affected by the direct removal of these surface water features within the construction footprint, a decline in habitat quantity and quality due to water withdrawals and changes in drainage patterns, as well as increased sediment and contaminant inputs associated with ground disturbance and construction activities.

- Temporary exceedances of ambient air quality standards for particulate matter at the SEZ boundaries are possible during construction. These high concentrations, however, would be limited to the immediate area surrounding the SEZ boundary. Modeling indicates that emissions from construction activities could exceed Class I Prevention of Significant Deterioration (PSD) PM_{10} (particulate matter with an aerodynamic diameter of 10 μm or less) increments at the nearest Class I area (Grand Canyon National Park), but the potential impacts would be moderate and temporary.

- Strong visual contrasts could be observed by visitors to the Desert National Wildlife Range, the Old Spanish National Historic Trail, Arrow Canyon WA, and travelers on Interstate 15 (I-15) and U.S. 93. Moderate visual contrasts could be observed by visitors to the Muddy Mountains WA, Muddy Mountains Special Recreation Management Area (SRMA), and the Nellis Dunes SRMA.

- Few, if any, impacts on significant paleontological resources are likely to occur in 90% of the proposed Dry Lake SEZ. The potential for impacts on significant paleontological resources in the remaining 10% of the SEZ is unknown. Direct impacts on significant cultural resources could occur in the SEZ; dune areas have potential to contain significant sites within the valley floors suitable for solar development. Direct impacts on the Old Spanish Trail/Mormon Road site within the SEZ are possible. It is likely that plant and animal species of cultural importance to the Southern Paiute are present within the SEZ. The culturally important Salt Song Trail approaches or passes through the SEZ and could experience visual and noise impacts by development of solar energy facilities.

- Minority and low-income populations occur within a 50-mi (80-km) radius of the proposed SEZ boundary; thus adverse impacts of solar development could disproportionately affect minority and low-income populations.

C.4.2.2 Summary of Comments Received

Many of the comments received on the proposed Dry Lake SEZ were in favor of identifying the area as an SEZ with proper siting and design (The Wilderness Society et al.;[19] The Nature Conservancy). For example, The Wilderness Society et al. and the Nevada Wilderness Project recommended excluding the dry lake, playa, and washes to avoid impacts on wildlife and special status species habitat, and removing the portion of the SEZ that is southeast of I-15 to avoid impacts on the Old Spanish National Historic Trail. The Cultural Resources Preservation Coalition and Partnership for the National Trails System also recommended adjusting the SEZ boundary to reduce impacts on the National Historic Trail. The U.S. Department of Defense (DoD) expressed concerns regarding impacts on use of the area for emergency aircraft bailout purposes.

The U.S. Fish and Wildlife Service (USFWS) identified the entire SEZ as an area of concern for desert tortoise recovery. Western Watersheds Project recommended that the Dry Lake SEZ be eliminated to avoid impacts on desert tortoise habitat.

C.4.2.3 Changes to the SEZ

The proposed Dry Lake SEZ has been reconfigured to include only the southernmost area that is northwest of I-15 (see Figure C.4.2-3). Excluding the northern portion of the SEZ will mitigate some potential impacts from development in the SEZ, including impacts on desert tortoise and other wildlife and potential impacts on military operations. The remaining area is

[19] The Wilderness Society, Center for Biological Diversity, Defenders of Wildlife, Sierra Club-Toiyabe Chapter, National Parks Conservation Association, Natural Resources Defense Council, Soda Mountain Wilderness Council, and Sierra Trek submitted joint comments on the proposed Nevada SEZs. Those comments are attributed to The Wilderness Society et al.

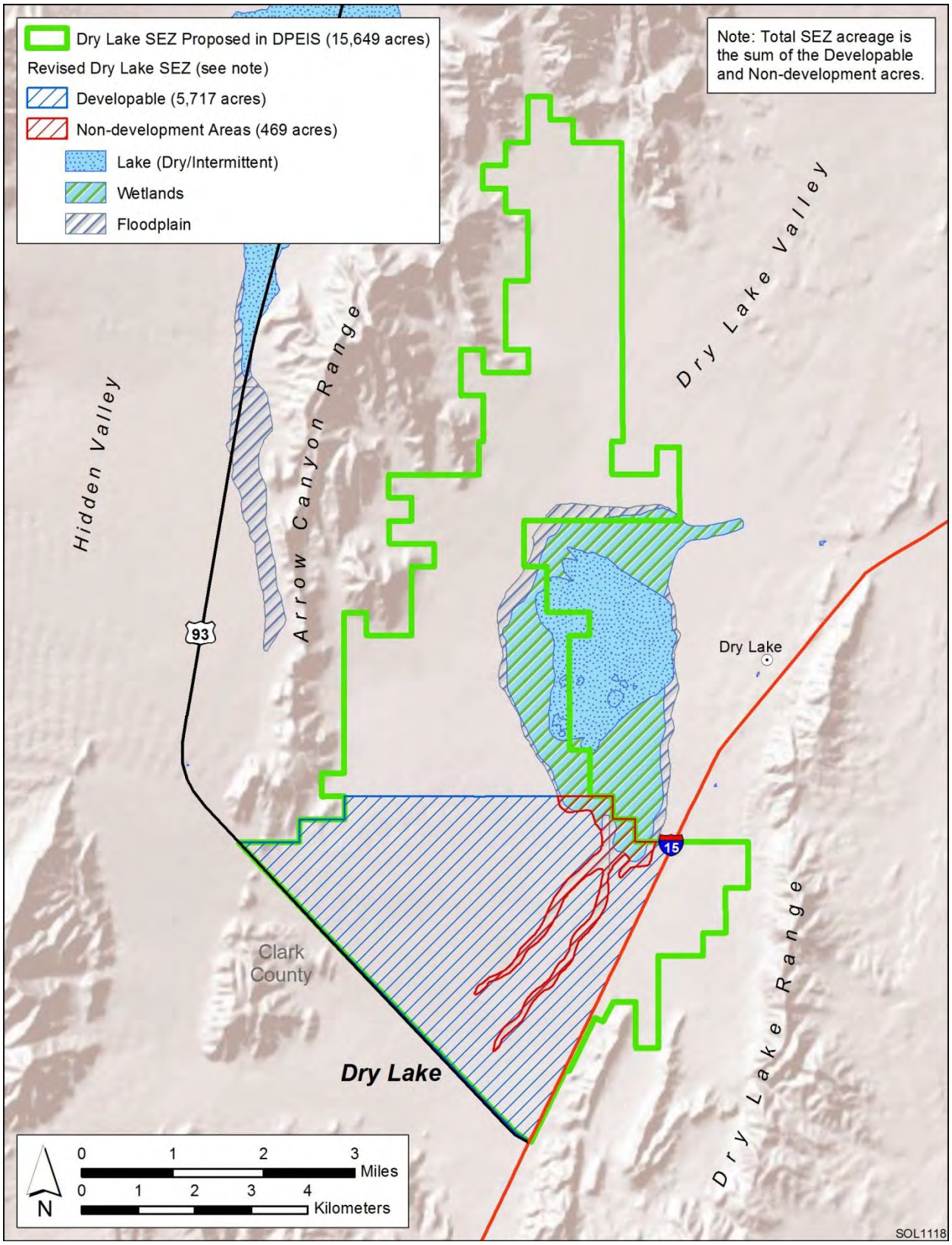

FIGURE C.4.2-2 Proposed Dry Lake SEZ as Described in this Supplement

6,186 acres (25 km^2). In addition, 469 acres (1.9 km^2) of floodplain and wetland non-development areas within the remaining SEZ boundaries were identified. The remaining developable area within the SEZ is 5,717 acres (23 km^2).

The lands eliminated from the proposed Dry Lake SEZ will be retained as solar right-of-way variance areas, because the BLM expects that individual projects could be sited in this area to avoid and/or minimize impacts. Any solar development within this area in the future would require appropriate environmental analysis.

C.4.2.4 Wilderness Character Status of SEZ

A recently maintained inventory of wilderness characteristics was used to determine whether public lands within the Dry Lake SEZ have wilderness characteristics. The finding of this inventory was that these lands do not contain wilderness characteristics.

C.4.2.5 Additional Data Collection Recommended

C.4.2.5.1 Lands and Realty

None.

C.4.2.5.2 Specially Designated Areas and Lands with Wilderness Characteristics

None.

C.4.2.5.3 Rangeland Resources

***Livestock Grazing*.** None.

***Wild Horses and Burros*.** None.

C.4.2.5.4 Recreation

None.

C.4.2.5.5 Military and Civilian Aviation

The DoD has expressed continued concern regarding the potential impact of solar development in this SEZ on military operations. The U.S. Department of the Interior Bureau of Land Management (BLM) will continue to consult with the DoD regarding potential issues with military operations.

C.4.2.5.6 Geologic Setting and Soil Resources

None.

C.4.2.5.7 Minerals

Additional information on leasable and strategic minerals in the vicinity of the proposed SEZ will be provided in the Final Solar PEIS to inform the Department of the Interior's decision on a proposed 20-year withdrawal of SEZ lands.

C.4.2.5.8 Water Resources

The following additional data and actions would help further characterize potential impacts on water resources for the proposed Dry Lake SEZ. A more detailed discussion of each of these activities is included in the water resources action plan provided in Section C.7.2 of this appendix.

- Prepare a planning-level water resources inventory of the Garnet Valley basin.

- Identify additional ephemeral stream channels and alluvial fan features for non-development areas through consultation with Nevada BLM, Nevada Division of Water Resources, U.S. Environmental Protection Agency, and U.S. Army Corps of Engineers (USACE) with a focus on:
  - Ephemeral stream channels/unnamed washes located throughout the SEZ (draining from the Las Vegas Range, the Arrow Canyon Range, and the Dry Lake Range toward Dry Lake), and
  - Alluvial fan features in the northwestern portion of the SEZ (adjacent to the Arrow Canyon Range).

- Coordinate with the USACE (Sacramento District) regarding jurisdictional water determinations for the SEZ. Water features to be considered include:
  - Unnamed washes.

- Perform field surveys and hydrologic analyses to support jurisdictional water determinations, if USACE consultation suggests field surveys are needed. Tasks may include:

  - Surveying any unnamed washes identified previously for surface elevations, high water marks, and sediment conditions.

- Describe the formation of a stakeholder committee to conduct long-term monitoring of water resources. This activity would entail:
  - Identifying key stakeholder agencies,
  - Discussing general features of a monitoring program, and
  - Working with the U.S. Geological Survey to develop groundwater monitoring well design and numerical groundwater models.

- Perform groundwater modeling analyses for the Garnet Valley basin to estimate potential impacts of full build-out groundwater pumping scenarios (according to estimated, technology-specific water requirements). Tasks include:
  - Develop a superposition-type groundwater model for the Garnet Valley basin, and
  - Assess the potential for drawdown impacts on water levels in the basin, other groundwater uses, the carbonate aquifer system, and surface water-groundwater connectivity.

C.4.2.5.9 Ecological Resources

Vegetation and Plant Communities. The following additional data-gathering actions would help further characterize potential impacts on vegetation and plant communities for the proposed Dry Lake SEZ:

- Identify and map the location and areal extent of desert dry washes, dry wash woodland, desert chenopod scrub, and wetland habitats within the SEZ. Identify and map the location and areal extent of these habitats, as well as playa and mesquite communities, outside the SEZ that may be affected by hydrologic changes, including groundwater elevations, and changes in water, sediment, and contaminant inputs associated with runoff. Such efforts could help determine habitat characteristics, including water source, hydrologic regime, and dominant plant species.

- Identify and map the location of cactus, including cholla and others, and Yucca species within the SEZ.

Wildlife. The following additional data-gathering actions would help further characterize potential impacts on wildlife resources for the SEZ:

- Conduct pre-disturbance surveys within the SEZ to determine the use of the SEZ as a movement/migratory corridor or as important habitat for mule deer.

- Identify and map the location and areal extent of wash and playa habitats within the SEZ. These areas are important habitat for a number of wildlife species.

Aquatic Biota. Investigations recommended under the water resources action plan (Section C.4.2.5.8) would be useful in characterizing and protecting habitat available to aquatic biota. Washes and wetlands in the SEZ are typically dry and contain water only for brief periods. They may or may not contain aquatic biota; therefore, preliminary evaluations of these surface water features could be conducted to determine the potential for aquatic communities to be present.

Special Status Species. The following additional data-gathering actions would be useful in further characterizing and protecting habitat available to special status species:

- Conduct pre-disturbance surveys within the SEZ to determine the presence and abundance of those special status species that are (1) federally listed, proposed for listing, or candidates for listing under the Endangered Species Act; (2) protected by the state of Nevada;[20] or (3) designated as sensitive by the Nevada BLM State Office. These species are listed in Table C.4.2-1. Surveys should focus on areas identified as potentially suitable, and the suitability of these habitats to support these special status species should be determined in the field. All field-determined suitable habitats for special status species should be mapped. Target species and survey protocols should be developed in coordination with the U.S. Fish and Wildlife Service (USFWS) and Nevada Department of Wildlife (NDOW).

  The Draft Solar PEIS presents a table of special status species for which potential impacts need to be evaluated prior to development in the proposed Dry Lake SEZ The list of species presented in Table 11.3.12.1-1 of the Draft Solar PEIS includes rare species (ranked in the State of Nevada as S1 or S2 or listed as a species of concern by the USFWS). On the basis of design features presented in the Draft Solar PEIS, the potential for impacts on these additional species will also need to be addressed before development could occur in the SEZ.

[20] State-protected species for the state of Nevada are those protected under *Nevada Revised Statues* (NRS) 501.110 (animals) or NRS 527 (plants).

TABLE C.4.2-1 Special Status Species That May Occur in the Vicinity of the Proposed Dry Lake SEZ[a]

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Plants			
Halfring milkvetch	*Astragalus mohavensis* var. *hemigyrus*	BLM-S	Endemic to Nevada on carbonate gravels and derivative soils on terraced hills and ledges, open slopes, and along washes within the creosote-bursage, blackbrush, and mixed-shrub habitat communities. Elevation ranges between 3,000 and 5,600 ft.[d] Nearest recorded occurrence is 15 mi[e] northwest of the SEZ in the Desert N WR. About 422,200 acres[f] of potentially suitable habitat occurs in the SEZ region.
Las Vegas bearpoppy[g]	***Arctomecon californica***	NV-P	Open, dry, spongy or powdery, often dissected or hummocked soils with high gypsum content, typically with well-developed soil crust, in areas of generally low relief on all aspects and slopes, with a sparse cover of other gypsum-tolerant species. Elevation ranges between 1,050 and 3,650 ft. Nearest recorded occurrence is 5 mi south of the SEZ. About 65,400 acres of potentially suitable habitat occurs in the SEZ region.
Las Vegas buckwheat	*Eriogonum corymbosum* var. *nilesii*	ESA-C; BLM-S	Restricted to southern Nevada in the vicinity of Las Vegas on or near gypsum soils, in washes, drainages, or in areas of generally low relief. Elevation ranges between 1,900 and 3,850 ft. Nearest recorded occurrence is 12 mi southwest of the SEZ. About 63,000 acres of potentially suitable habitat occurs in the SEZ region.
Parish's phacelia	*Phacelia parishii*	BLM-S	Aquatic habitats and wetlands in moist to superficially dry, open, flat, mostly barren, salt-crusted silty-clay soils on valley bottoms, lake deposits, playa edges in proximity to seepage areas surrounded by saltbush scrub vegetation. Elevation ranges from 2,200 to 5,950 ft. Nearest recorded occurrence is 19 mi southwest of the SEZ. About 81,700 acres of potentially suitable habitat occurs in the SEZ region.
Rock phacelia	*Phacelia petrosa*	BLM-S	Dry limestone and volcanic talus slopes of foothills, washes, and gravelly canyon bottoms on substrates derived from calcareous material. Inhabits mixed desert scrub, creosotebush, and blackbrush at elevations between 2,500 and 5,800 ft. Nearest recorded occurrence is 9 mi west of the SEZ in the Desert NWR. About 4,242,700 acres of potentially suitable habitat occurs in the SEZ region.
Rosy two-tone beard-tongue	***Penstemon bicolor* ssp. *roseus***	BLM-S	Calcareous, granitic, or volcanic soils in washes, roadsides, scree at outcrop bases, rock crevices, or similar places receiving runoff, within creosote-bursage, blackbrush, and mixed-shrub. Elevation ranges between 1,800 and 4,850 ft. Known to occur on the SEZ and throughout the affected area. About 524,100 acres of potentially suitable habitat occurs in the SEZ region.
Rough dwarf greasebush	*Glossopetalon pungens* var. *pungens*	BLM-S;	Endemic to the Spring and Sheep ranges in southern Nevada, where the species is known from seven occurrences in the crevices of carbonate cliffs and outcrops, generally avoiding southerly exposures, within pinyon-juniper, mountain mahogany, and montane conifer communities. Elevation ranges from 4,400 to 7,800 ft. Nearest recorded occurrence is 17 mi west of the SEZ in the DNWR. About 606,000 acres of potentially suitable habitat occurs in the SEZ region.

TABLE C.4.2-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Plants (Cont.)			
Sheep fleabane	*Erigeron ovinus*	BLM-S	Endemic to Mount Irish and the Sheep and Groom ranges in southern Nevada, where the species is known from fewer than 15 occurrences in crevices of carbonate cliffs and ridgeline outcrops within pinyon-juniper and montane conifer woodland. Elevation ranges from 3,600 to 8,400 ft. Nearest recorded occurrence is 17 mi northwest of the SEZ in the Desert NWR. About 576,650 acres of potentially suitable habitat occurs in the SEZ region.
Sheep Mountain milkvetch	*Astragalus amphioxys* var. *musimonum*	BLM-S	Restricted to the foothills of the Sheep Mountains in southern Nevada (historically occurred in Arizona). Occurs in carbonate alluvial gravels, particularly along drainages, roadsides, and in other microsites with enhanced runoff, at elevations between 4,400 and 6,000 ft. Nearest recorded occurrence is 6 mi northwest of the SEZ in the Desert NWR. About 3,884,600 acres of potentially suitable habitat occurs in the SEZ region.
Silverleaf sunray	*Enceliopsis argophylla*	BLM-S	Nearly entirely confined to Clark County, Nevada, in dry, open, relatively barren areas on gypsum badlands, volcanic gravels, or loose sands, within creosote-bursage habitat. Elevation ranges from 1,200 to 2,400 ft. Nearest recorded occurrence is 15 mi east of the SEZ. About 89,100 acres of potentially suitable habitat occurs in the SEZ region.
Sticky buckwheat	*Eriogonum viscidulum*	NV-P	Known only from Clark County, Nevada, and Mohave County, Arizona, on deep, loose sandy soils in washes, flats, roadsides, steep aeolian slopes, and stabilized dunes. Elevation ranges from 1,200 to 2,200 ft. Nearest recorded occurrence is 21 mi northeast of the SEZ. About 65,000 acres of potentially suitable habitat occurs in the SEZ region.
Threecorner milkvetch	***Astragalus geyeri* var. *triquetrus***	NV-P	Known only from Clark County, Nevada, and Mohave County, Arizona on open, deep sandy soils, desert washes, or dunes, generally stabilized by vegetation and/or a gravel veneer. Elevations range from 1,500 to 2,500 ft. Nearest recorded occurrence is about 1 mi east of the SEZ. About 105,700 acres of potentially suitable habitat occurs in the SEZ region.
White bearpoppy	*Arctomecon merriamii*	BLM-S	Endemic to the Mojave Desert of California and Nevada in barren gravelly areas, rocky slopes, and limestone outcrops at elevations between 2,000 and 5,900 ft. Nearest recorded occurrence is 19 mi southwest of the SEZ. About 358,000 acres of potentially suitable habitat occurs in the SEZ region.
Yellow two-tone beard-tongue	***Penstemon bicolor* ssp. *bicolor***	BLM-S	Endemic to Clark County, Nevada, on mostly BLM lands in the vicinity of Las Vegas on calcareous or carbonate soils in washes, roadsides, rock crevices, or outcrops at elevations between 2,500 and 5,500 ft. Nearest recorded occurrence is from a dry lake approximately 2 mi west of the SEZ. About 524,100 acres of potentially suitable habitat occurs in the SEZ region.

TABLE C.4.2-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Invertebrates			
Mojave gypsum bee	*Andrena balsamorhizae*	BLM-S	Endemic to Nevada on gypsum soils associated with habitats of its single larval host plant, silverleaf sunray. Such habitats include warm desert shrub communities on dry slopes and sandy washes. Nearest recorded occurrence is 8 mi south of the SEZ. About 3,819,500 acres of potentially suitable habitat occurs in the SEZ region.
Mojave poppy bee	*Perdita meconis*	BLM-S	Known only from Clark County, Nevada where the species is dependent on poppy plants (genus *Arctomecon*). in roadsides, washes, and barren desert areas on gypsum soils. Nearest recorded occurrence is in the vicinity of Lake Mead, approximately 17 mi south of the SEZ. About 418,000 acres of potentially suitable habitat occurs in the SEZ region.
Reptiles			
Desert tortoise	***Gopherus agassizii***	ESA-T; NV-P	Desert creosotebush communities on firm soils for digging burrows along riverbanks, washes, canyon bottoms, creosote flats, and desert oases. Known to occur on the SEZ and throughout the affected area. About 2,762,500 acres of potentially suitable habitat occurs in the SEZ region.
Gila monster	*Heloderma suspectum*	BLM-S; NV-P	Rocky, deeply incised areas of desert scrub, thorn scrub, desert riparian, oak woodland, and semidesert grassland. Occurs in lower mountain slopes, rocky bajadas, canyon bottoms, and arroyos at elevations below 3,950 ft. Known to occur in Clark County, Nevada. About 3,175,900 acres of potentially suitable habitat occurs in the SEZ region.
Birds			
American peregrine falcon	*Falco peregrinus*	BLM-S; NV-P	Year-round resident in open habitats, including deserts, shrublands, and woodlands associated with high, near vertical cliffs and bluffs above 200 ft. When not breeding, activity is concentrated in areas with ample prey, such as farmlands, marshes, lakes, rivers, and urban areas. Nearest recorded occurrences are from the metropolitan area of Las Vegas, Nevada, approximately 22 mi southwest of the SEZ. About 4,171,400 acres of potentially suitable habitat occurs in the SEZ region.
Crissal thrasher	*Toxostoma crissale*	BLM-S	Year-round resident in project area. Nests in dense thickets of mesquite or low trees in desert riparian and desert wash habitats. Also occurs in washes within pinyon-juniper habitats. Known to occur in Clark County, Nevada. About 81,000 acres of potentially suitable habitat occurs in the SEZ region.
Ferruginous hawk	*Buteo regalis*	BLM-S	Winter resident in project area in grasslands, sagebrush, and saltbrush habitats, as well as the periphery of pinyon-juniper woodland. Known to occur in Clark County, Nevada. About 417,500 acres of potentially suitable habitat occurs in the SEZ region.

TABLE C.4.2-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Birds (Cont.)			
LeConte's thrasher	*Toxostoma lecontei*	BLM-S; NV-P	Year-round resident in project area in saltbush-cholla scrub communities in desert flats, dunes, or alluvial fans. Known to occur in Clark County, Nevada. About 3,817,950 acres of potentially suitable habitat occurs in the SEZ region.
Phainopepla	*Phainopepla nitens*	BLM-S; NV-P	Year-round resident in project area in desert scrub, mesquite, pinyon-juniper woodland, desert riparian areas and orchards. Nests in trees or shrubs. Nearest recorded occurrences are from the Meadow Valley Wash and Muddy River systems, approximately 20 mi east of the SEZ. About 1,038,500 acres of potentially suitable habitat occurs in the SEZ region.
Western burrowing owl	*Athene cunicularia hypugaea*	BLM-S	Open grasslands and prairies, as well as disturbed sites such as golf courses, cemeteries, and airports throughout the SEZ region. Nests in burrows constructed by mammals (prairie dog, badger, and the like). Known to occur in Clark County, Nevada. About 4,034,600 acres of potentially suitable habitat occurs in the SEZ region.
Mammals			
Big free-tailed bat	*Nyctinomops macrotis*	BLM-S	Roosts in rock crevices on cliff faces or in buildings. Forages primarily in coniferous forests and arid shrublands to feed on moths. Known to occur in Clark County, Nevada. About 4,048,200 acres of potentially suitable habitat occurs in the SEZ region.
Brazilian free-tailed bat	*Tadarida brasiliensis*	BLM-S	Forages in desert grassland, old field, savanna, shrubland, and woodland habitats as well as urban areas. Roosts in old buildings, caves, mines, and hollow trees. Known to occur in Clark County, Nevada. About 3,722,850 acres of potentially suitable habitat occurs in the SEZ region.
Pallid bat	*Antrozous pallidus*	BLM-S; NV-P	Low-elevation desert communities, including grasslands, shrublands, and woodlands. Roosts in caves, crevices, and mines. Nearest recorded occurrences are from the Desert NWR, approximately 10 mi west of the SEZ. About 3,706,300 acres of potentially suitable habitat occurs in the SEZ region.
Silver-haired bat	*Lasionycteris noctivagans*	BLM-S	High-elevation (1,600 to 8,500 ft) forested areas of aspen, cottonwood, white fir, pinyon-juniper, subalpine fir, willow, and spruce. Roosts in tree foliage, cavities, under loose bark, caves, mines, and under rock ledges. May also forage in arid shrublands. Rarely hibernates in caves. Nearest recorded occurrences are from the Muddy River, approximately 15 mi northeast of the SEZ. About 3,586,800 acres of potentially suitable habitat occurs in the SEZ region.
Spotted bat	*Euderma maculatum*	BLM-S; NV-P	Near forests and shrubland habitats throughout the SEZ region. Roosts and hibernates in caves and rock crevices. Nearest recorded occurrences are from the vicinity of Las Vegas, approximately 16 mi southwest of the SEZ. About 4,404,950 acres of potentially suitable habitat occurs in the SEZ region.

TABLE C.4.2-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Mammals (Cont.)			
Townsend's big-eared bat	*Corynorhinus townsendii*	BLM-S; NV-P	Near forests and shrubland habitats below 9,000 ft elevation throughout the SEZ region. Roosts in caves, mines, and buildings for day roosting. Nearest recorded occurrences are from the Desert NWR, approximately 10 mi west of the SEZ. About 3,861,200 acres of potentially suitable habitat occurs in the SEZ region.
Western small-footed myotis	*Myotis ciliolabrum*	BLM-S	Woodland and riparian habitats at elevations below 9,000 ft. Roosts in caves, buildings, mines, and crevices of cliff faces. Nearest recorded occurrences are from the Desert NWR, approximately 10 mi west of the SEZ. About 4,325,600 acres of potentially suitable habitat occurs in the SEZ region.

[a] The listings for (1) federally listed, proposed for listing, or candidates for listing under the ESA and (2) Nevada BLM State Office sensitive species have been updated since the release of the Draft Solar PEIS.

[b] BLM-S = listed as a sensitive species by the BLM; ESA-C = candidate for listing under the ESA; ESA-T = listed as threatened under the ESA; NV-P = protected in the state of Nevada under NRS 501.110 (animals) or NRS 527 (plants).

[c] For plant species, potentially suitable habitat was determined by using Southwest Regional Gap Analysis (SWReGAP) land cover types (USGS 20005). For terrestrial vertebrate species, potentially suitable habitat was determined by using SWReGAP habitat suitability and land cover models. Area of potentially suitable habitat for each species is presented for the SEZ region, which is defined as the area within 50 mi (80 km) of the SEZ center.

[d] To convert ft to m, multiply by 0.3048.

[e] To convert mi to km, multiply by 1.609.

[f] To convert acres to km^2, multiply by 0.004047.

[g] Species in bold text have been recorded or observed in the affected area.

- Identify and map the location and areal extent of ephemeral wetland habitats, including desert wash and playa habitats within the SEZ. Habitat characteristics (including water source, hydrologic regime, and dominant plant species, both within the wetland boundaries and in adjacent non-wetland habitats) should be determined. Species potentially associated with these habitats include the halfring milkvetch, Las Vegas buckwheat, Parish's phacelia, rosy two-tone beardtongue, sticky buckwheat, threecorner milkvetch, and yellow two-tone beardtongue.

C.4.2.5.10 Air Quality and Climate

None.

C.4.2.5.11 Visual Resources

Visual resources will be re-evaluated for the Final Solar PEIS based on the revisions to boundaries described in Section C.4.2.3 of this Supplement. A summary of the Draft Solar PEIS visual contrast analysis for the proposed Dry Lake SEZ is provided in Table C.4.2-2. This table includes only those resources that would be subject to moderate or strong visual contrast. The Draft Solar PEIS visual impact analysis predicted these levels of visual contrast from solar energy development in the Dry Lake SEZ for the following sensitive visual resource areas (SVRAs) and sensitive viewing locations (SVLs):

- Desert National Wildlife Refuge (NWR)
- Old Spanish National Historic Trail
- Arrow Canyon WA
- Muddy Mountains WA
- Muddy Mountains SRMA
- Nellis Dunes SRMA
- I-15
- U.S. 93.

The following steps could be taken to better understand potential impacts on these SVRAs and SVLs from solar development in the Dry Lake SEZ:

- Identify key observation points (KOPs) within these areas through working with the management agency or other local stakeholders.
- Conduct viewshed analyses from the KOPs to determine how much of the SEZ would be in view from each KOP.
- As deemed necessary, based on viewshed analysis results, prepare wireframe Google Earth™ visualizations of hypothetical solar facilities in the SEZ depicting the 80% development scenario to better estimate potential impacts.

This additional analysis may help judge potential visual contrast more accurately for most KOPs. For KOPs of particularly high sensitivity, a site visit with photography and superimposition of the wireframe models onto the photos might be required or desired.

TABLE C.4.2-2 Summary of Potential Visual Impacts on SVRAs and SVLs within the 25-mi (40-km) Viewshed of the Proposed Dry Lake SEZ

Management Area Category	SVRA/SVL within 25 mi[a] of SEZ	Total Acreage/ Mileage[a,b,c] of SVRA/SVL	Distance from SEZ at Point of Closest Approach[d]	Total Acreage/Mileage Visible within 25 mi[e]	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes[f]
NWR	Desert NWR	1,626,903 acres	2.3 mi west of the SEZ	51,276 acres	3.2	Because of the close proximity to the SEZ and the elevated viewpoints in the NWR, strong visual contrasts could be observed. Areas with potential visibility of solar facilities include the eastern slopes of mountains and ridges of the Las Vegas Range, primarily within 10 mi of the SEZ, but extending for some areas to beyond 15 mi into the NWR, along the peaks of the Sheep Range.
National Historic Trail	Old Spanish Trail[g]	1,200 mi	Passes within 1.3 mi on the southeast side of the SEZ	23 mi	1.9	Because of the close proximity to the SEZ and the elevated viewpoints, strong visual contrasts could be observed. About 8.8 mi of the trail located within the viewshed are high potential segments.
WAs	Arrow Canyon	27,521 acres	2.5 mi north of the SEZ	1,485 acres	5.4	Moderate or even strong levels of visual contrast would be expected for high-elevation viewpoints, with weak levels of visual contrast expected for most lower elevation viewpoints. Areas with potential views of SEZ extend to 9.1 mi from the northern boundary of the SEZ.

TABLE C.4.2-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi[a] of SEZ	Total Acreage/ Mileage[a,b,c] of SVRA/SVL	Distance from SEZ at Point of Closest Approach[d]	Total Acreage/Mileage Visible within 25 mi[e]	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes[f]
WAs (*Cont*.)	Muddy Mountains	44,522 acres	6.6 mi southeast of the SEZ	5,798 acres	13.0	Moderate levels of visual contrast would be expected for high-elevation viewpoints, with weak levels of visual contrast expected for most lower-elevation viewpoints. The SEZ would be visible from scattered areas throughout the mountains in the western half.
SRMAs	Muddy Mountains	128,493 acres	4.5 mi southeast of the SEZ	25,741 acres	20.0	Moderate levels of visual contrast would be expected for high-elevation viewpoints, with weak levels of visual contrast expected for most lower-elevation. The visible area extends from point of closest approach to 12 mi into the SRMA from the southeast boundary of the SEZ.
	Nellis Dunes	8,921 acres	4.3 mi south of the SEZ	448 acres	5.0	Because of the elevated viewpoints in the SRMA, moderate visual contrasts could be observed Areas with view to SEZ are located near northern boundary of the SRMA.
Other Areas of Interest (non-management areas)	I-15[h]	124 mi	3.7 mi passes along and through the southeastern-most portion of the SEZ	38 mi	30.6	Facilities could be in view from about 38 mi of the roadway, but contrast levels would generally be minimal or weak for I-15 except where the highway passes through the Dry Lake Range and especially the SEZ itself; in these locations contrast levels would likely be strong.

TABLE C.4.2-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi[a] of SEZ	Total Acreage/ Mileage[a,b,c] of SVRA/SVL	Distance from SEZ at Point of Closest Approach[d]	Total Acreage/Mileage Visible within 25 mi[e]	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes[f]
Other Areas of Interest (non-management areas) (*Cont.*)	U.S. 93[i]	1,311 mi	4.5 mi of U.S. 93 pass along the SEZ's southwestern boundary	13 mi	1.0	Northbound travelers would first see solar facilities at the I-15 interchange, with strong visual contrasts visible for several minutes until views of the SEZ would be screened by the Arrow Canyon Range. After that point, expected contrast levels would drop to minimal levels. Southbound travelers would see minimal contrast until they passed the Arrow Canyon Range, and they would likely see strong contrasts thereafter until they reached I-15.

[a] To convert mi to km, multiply by 1.609.

[b] To convert acres to km^2, multiply by 0.004047.

[c] Mileage (within all columns) is used only for trails or roads, unless otherwise specified.

[d] Distances at the point of closest approach are based on the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries would result in changes to these calculations.

[e] The total acreage/mileage visible within 25 mi (40 km) of the SEZ is based on the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries would result in changes to these acreages/mileages, as well as the percentage of total acreage/mileage visible within 25 mi (40 km) of the SEZ.

[f] The assessment of impacts is based the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries may result in reduced impacts in some of the SVRAs/SVLs due to the reduction in the overall footprint of the SEZ.

[g] Total length of Old Spanish Trail (not just West Branch): BLM (2011a).

[h] Mileage of I-15 through Nevada only: AARoads' Interstate Guide (2007).

[i] Total mileage of U.S. 93: DOT (2011a).

C.4.2.5.12 Acoustic Environment

None.

C.4.2.5.13 Paleontological Resources

The BLM Regional Paleontologist will be contacted to determine whether additional information is available regarding Potential Fossil Yield Classification (PFYC) identifications in Nevada. A preliminary paleontological survey could be conducted to determine the PFYC of the SEZ, in order to update the temporary assignment of PFYC Class 2 (90%) and Class 3b (10%) used in the Draft Solar PEIS.

C.4.2.5.14 Cultural Resources and Native American Concerns

Approximately 60.2% of the original proposed Dry Lake SEZ footprint has been surveyed for cultural resources, identifying 22 sites within the SEZ. One site is listed in the *National Register of Historic Places* (NRHP), 5 have been determined eligible for listing, and the remaining 15 sites are either not eligible or have not been evaluated for listing in the NRHP. For the revised footprint, approximately 47.9% has been surveyed (2,743 acres [11.1 km²]), and only 6 sites have been recorded in this portion of the SEZ. One of these sites is identified as the Old Spanish Trail/Mormon Road, an eligible site located in the southeastern portion of the SEZ. The eligibility status of the other five sites is unknown at this time. At least 229 sites have been recorded within 5 mi (8 km) of the original SEZ footprint. As with other SEZs, dune areas and areas along washes and dry lakes have the highest potential for containing significant archaeological resources within the SEZ. Several culturally important areas have also been identified near the SEZ, including specific valleys, trails, and water sources. The destruction or degradation of important plant and water resources and the destruction of habitat or impediments to the movement of culturally important wildlife are also potential impacts of concern within the SEZ.

The following additional data collection efforts could reduce the uncertainty about potential impacts:

- Conduct a Class I literature file search to better understand (1) the site distribution pattern in the vicinity of the SEZ, (2) potential trail networks through existing ethnographic reports, and (3) overall cultural sensitivity of the landscape.

- Verify that the surveys that have been conducted in the SEZ meet current survey standards. No Class II surveys are currently being recommended.

- Prepare a cultural sensitivity map based on the results of the Class I review.

- Identify high-potential segments of the Old Spanish National Historic Trail and viewshed analyses from key points along the trail. High-potential segments of the trail have been identified just east of the SEZ; however, it is also reported that a portion of the trail may go through the SEZ.

- Continue with government-to-government consultation as described in Section 2.4.3, including follow-up to recent ethnographic studies with Tribes not included in the original studies to determine whether those Tribes have similar concerns. The Dry Lake SEZ falls in the traditional use area of primarily the Southern Paiute. Potential topics presented in the Final Solar PEIS to be discussed during consultation include the Salt Song Trail and other trail systems, mountain springs, mineral resources, burial sites, ceremonial areas, the Moapa Valley, and plant and animal resources. The agencies value the information shared by the Tribes during the ethnographic study and will consider their input in striving to minimize the impacts of solar development in the SEZ. The completed ethnographic study will be available in its entirety on the Solar PEIS Web site (http://solareis.anl.gov). A summary of the contents of that report is also provided in the following text box.

Tribal Perspectives on the Significance of the Dry Lake SEZ

The lands under consideration in the Dry Lake SEZ study area were traditionally occupied, used, aboriginally owned, and historically related to the Numic-speaking peoples of the Great Basin and western Colorado Plateau. The Tribe specifically involved in the field consultation for this SEZ study area is the Moapa Band of Paiute Indians, who represent the cultural interests of Southern Paiute peoples. These Numic-speaking peoples have gone on record in past projects and continue to stipulate here that they are the American Indian people responsible for the cultural resources (natural and man-made) in this SEZ study area because their ancestors were placed here by the Creator. Since time immemorial, they have lived in these lands, maintaining and protecting these places, plants, animals, water sources, and cultural signs of their occupation. The involved American Indian Tribal government and their appointed cultural representatives have participated in this PEIS in order to explain the meaning and cultural centrality of the plants, animals, spiritual trails, healing places, and places of historic encounters that exist in these lands.

The larger SEZ study area extends beyond the boundaries of the proposed SEZ because cultural resources extend into the surrounding landscape. Southern Paiute Tribal representatives maintain that, in order to understand Southern Paiute connections to the SEZ, they must be placed in context with neighboring places and their associated cultural resources found in the SEZ study region.

Rain and snow runoff from the surrounding mountains also flows into the SEZ study area. It is important from a Southern Paiute perspective to understand the hydrological system in this region. The flow of *Puha* (energy or power) follows the flow of water across a given landscape and connects places, people, and other elements. As water drains from the mountains, the water and the Puha flow into the valley, connecting these sources to the rest of the watershed, including the Colorado River, the Muddy River, and the Virgin River. Water also holds immense importance in its power to connect near and distant elements. Dry lakes embody this phenomenon by connecting to other dry lakes and all water in the area underground. Water on and below the surface connects water resources in the mountains to the rain. The importance of the water is also highlighted in Tribal representatives' concerns regarding the potential consequences of overdrawing groundwater.

Tribal Perspectives on the Significance of the Dry Lake SEZ (Cont.)

The northern portion of the SEZ study region and the Arrow Canyon Range (to the north of the SEZ) are directly connected to the Cry Ceremony and the associated Salt Song Trail. When a Southern Paiute person passes away, the Cry Ceremony is performed and specially trained singers perform the Salt Song. This song and associated spiritual trail carry the soul of the deceased along a thousand mile journey through traditional Southern Paiute territory and neighboring Hualapai territory. During this journey, the deceased transitions from this world into the spiritual world, or afterlife.

The Arrow Canyon Range is associated with Southern Paiute songs, stories, and ceremonies. One story describes how *Shin-au-av* (Coyote) formed the area with a shot of his arrow. Another story links the Arrow Canyon Range to a Creation Being, Potato Woman. Potato Woman is responsible for the creations of a variety of Nah'-gah (Mountain Sheep, *Ovis spp*.) that live exclusively in the Arrow Canyon Range. The Nah'gah, in turn, have and continue to bring songs, stories, and medicine to Indian people. Impacts on the Arrow Canyon Range directly affect the health of Potato Woman and the creation of the Nah'-gah. Areas within the Arrow Canyon Range were used for round dances and balancing ceremonies. In 1890, Southern Paiute people went to the Arrow Canyon Range to perform the Ghost Dance in order to restore balance to the world.

The Arrow Canyon Range was the center of a large traditional district composed of what are now the Moapa and Pahranagat Southern Paiutes prior to colonial disruption (Stoffle and Dobyns 1983). Full-time agricultural settlements were located within the large hydrological system beginning northeast of Pahranagat Valley and continuing down along the Muddy, Virgin, and Colorado Rivers. Arrow Canyon Valley was used for hunting, gathering, and traveling between these agricultural settlements. These continual use patterns account for scattered archaeological remains in the area of the Arrow Canyon Range (Stoffle and Dobyns 1983).

During multiple field visits, Native American representatives identified 15 traditional use plants within the Dry Lake SEZ study area. These included Anderson's wolfberry, Banana yucca, Beavertail Cactus, California barrel cactus, Creosote bush, Desert globemallow, desert trumpet, Golden cholla, Hedgehog cactus, Honey mesquite, Indian tea, Mojave yucca, Nevada Indian tea, Spiny chorizanthe, and western wheatgrass. Thirty-four traditional use animals were also identified which included among others Black-tailed jack rabbit, bobcat, cougar, Desert cottontail, Coyote, Kangaroo rat, Grey fox, and a variety of birds. One animal that drew particular attention was the mountain sheep, described in stories and songs associated with the region.

Traditionally, Southern Paiute people were agriculturalists who built complex irrigation systems and tended to numerous plant species. Southern Paiute farmers often grew and managed crops that were generally not recognized as crops by Euro-Americans. For example, Southern Paiutes planted and managed mesquite trees. The trees were often planted in riverine oases throughout Southern Paiute territory. In the Dry Lake Valley SEZ study area, multiple large stands of sweet mesquite were noted by Tribal representatives. They believed that these orchards of mesquite trees were planted and maintained by Southern Paiute people in the past and that this area is an important cultural feature.

C.4.2.5.15 Socioeconomics and Environmental Justice

None.

C.4.2.5.16 Cumulative Impact Considerations

None.

C.4.3 Dry Lake Valley North

C.4.3.1 Summary of Potential Impacts Identified in the Draft Solar Programmatic Environmental Impact Statement (PEIS)

The proposed Dry Lake Valley North solar energy zone (SEZ), as presented in the Draft Solar PEIS, had a total area of 76,874 acres (311km^2). It is located in Lincoln County in southeastern Nevada (Figure C.4.3-1). The towns of Pioche and Caliente are about 15 mi (24 km) east of, and 15 mi (24 km) southeast of, the SEZ, respectively.

There are three designated transmission corridors in the proposed SEZ that could limit development in the SEZ because solar facilities cannot be constructed under transmission lines. The discussion of impacts of solar energy development in the SEZ in the Draft Solar PEIS acknowledged that the presence of these corridors would reduce the amount of land available for solar power production, and that, conversely, full development of solar facilities within the SEZ would limit use of transmission corridors.

The Draft Solar PEIS identified a 69-kV transmission line that passes through the southeast corner of the proposed SEZ as the nearest point for connection of the SEZ to the grid. The actual location of connection to the transmission grid could be different than that assumed in the Draft Solar PEIS. Details on the updated transmission impact assessment for SEZs to be included in the Final Solar PEIS are provided in Section C.7.1 of this appendix. The Draft Solar PEIS also identified State Route 318, located about 7 mi (11 km) to the west of the SEZ, as the nearest major road, and assumed that a new access road would be constructed from the proposed SEZ to State Route 318 to support development. As for a new transmission line, the location of a new access road that could be constructed in the future may be different from that assumed in the Draft Solar PEIS. Analysis of transmission lines and/or access roads will be completed, as necessary, as part of the project-specific environmental reviews (see Section 2.2.2.2.2 of this Supplement).

Potential adverse impacts identified in the Draft Solar PEIS included the following:

- Because of the extended length of the SEZ, east–west travel across the valley could be cut off, requiring extensive detours for public land users.

- There would be a small adverse impact on wilderness characteristics in the Weepah Spring and Big Rocks Wilderness Areas (WAs). Silver State Off-Highway Vehicle Trail/Byway users seeking a scenic drive experience would be adversely affected.

- The Simpson grazing allotment would be closed, 65% of the Ely Springs Cattle allotment would be lost, and all of the winter range for the permittees in the Dry Lake Valley and Thorley areas of use in the Wilson Creek and Simpson grazing allotments would be lost. A total of 12,163 animal

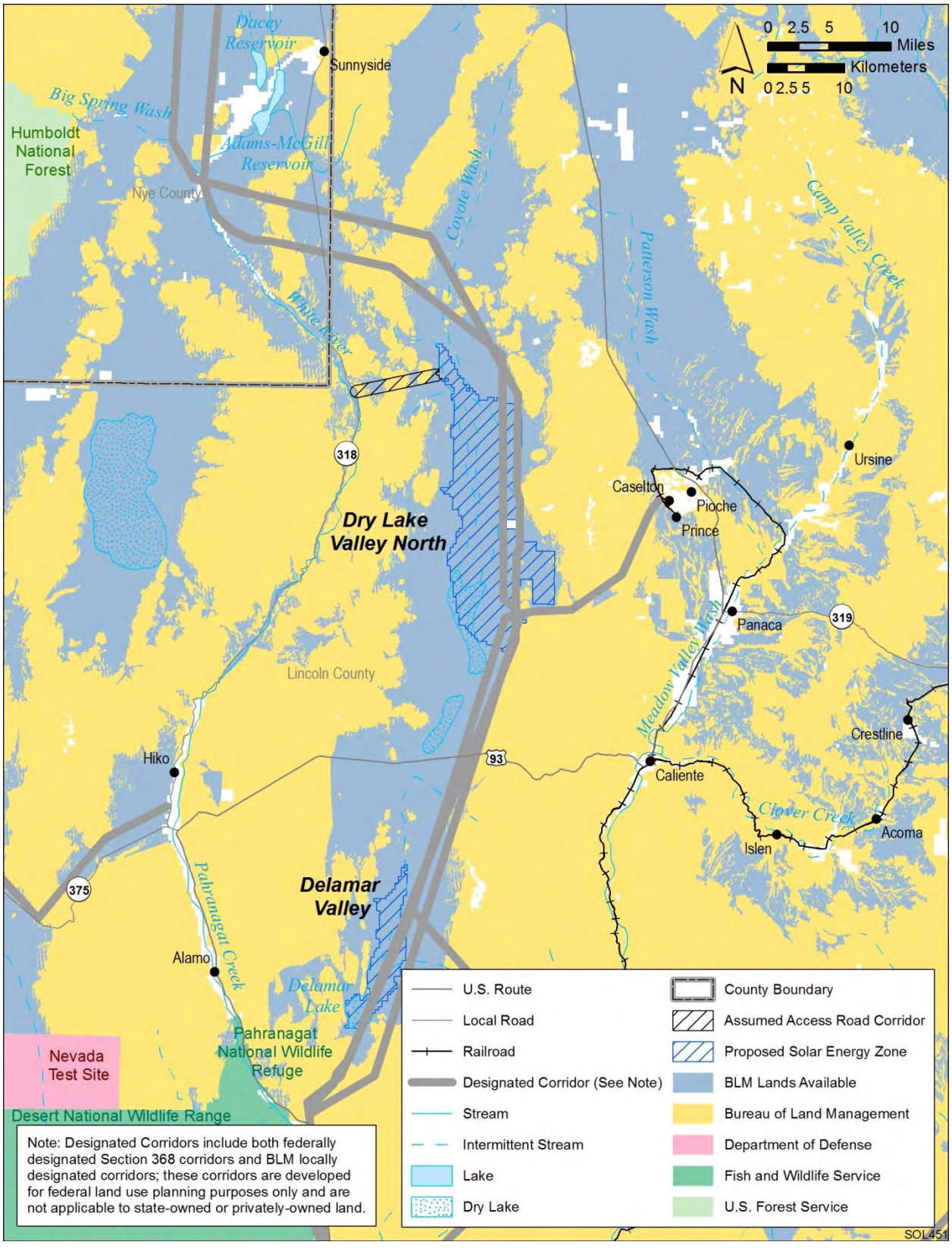

FIGURE C.4.3-1 Proposed Dry Lake Valley North SEZ as Presented in the Draft Solar PEIS

unit months would be lost and operations of six permitees would suffer major impacts.

- A portion of the Silver King herd management area (HMA) occurs in the affected area of the proposed SEZ; about 5.4% of the HMA would be directly affected by development.

- There are potential impacts on two low-level military training routes (MTRs) and the Nevada Test and Training Range (NTTR). The U.S. Department of Defense (DoD) indicated strong concerns over development in this SEZ since there may be adverse impacts on military training and testing activities.

- Impacts on soil resources (e.g., soil compaction, soil horizon mixing, soil erosion by wind and runoff, sedimentation, and soil contamination) could occur. Portions of the dry lake may not be suitable for construction.

- Existing oil and gas leases represent a prior existing right that could affect solar energy development of the SEZ.

- Groundwater use would deplete the aquifer to the extent that, at a minimum, wet-cooling options would not be feasible.

- Clearing of a large portion of the proposed SEZ could primarily affect mixed salt desertscrub, and may adversely affect dry wash, playa, greasewood flat, and wetland habitats, depending on the amount of habitat disturbed. The establishment of noxious weeds could result in habitat degradation. Deposition of fugitive dust could cause reduced productivity or changes in plant community structure

- Potentially suitable habitat for 22 special status species and more than 90 wildlife species occurs in the affected area of the proposed SEZ; 8.4% or less (4.0% or less for most wildlife species) of the potentially suitable habitat for any of these species occurs in the region that would be directly affected by development.

- If aquatic biota exist within the Coyote Wash, unnamed ephemeral braided washes, and dry lake with associated wetlands, they could be affected by the direct removal of these surface water features within the construction footprint, a decline in habitat quantity and quality due to water withdrawals and changes in drainage patterns, as well as increased sediment and contaminant inputs associated with ground disturbance and construction activities.

- Temporary exceedances of ambient air quality standards for particulate matter at the SEZ boundaries are possible during construction. These high

concentrations, however, would be limited to the immediate area surrounding the SEZ boundary.

- Strong visual contrasts could be observed by visitors to the Chief Mountain Special Recreation Management Area (SRMA) and travelers on the Silver State Trail. Weak to strong visual contrasts could be observed by visitors to Big Rocks and Weepah Spring WAs. Moderate visual contrasts could be observed by travelers on U.S. 93.

- Few, if any, impacts on significant paleontological resources are likely to occur in 91% of the proposed SEZ. The potential for impacts on significant paleontological resources in the remaining 9% of the SEZ is unknown. Direct impacts on significant cultural resources could occur in the SEZ; there is a high potential for prehistoric sites, especially in the dry lake and dune areas at the southern end of the SEZ.

- Low-income populations occur within a 50-mi (80-km) radius of the proposed SEZ boundary; thus adverse impacts of solar development could disproportionately affect low-income populations.

C.4.3.2 Summary of Comments Received

Many of the comments received on the proposed Dry Lake Valley North SEZ were in favor of identifying the area as an SEZ with proper siting and design. The Wilderness Society et al.[21] and Nevada Wilderness Project recommended boundary adjustments to avoid important wildlife and special status species habitat. Other groups and individual members of the public were in favor of identifying the area as an SEZ, with boundary adjustments due to impacts on grazing (N-4 State Grazing Board, Lincoln County Board of Commissioners). The Lincoln County Board of Commissioners specifically requested that the area of the SEZ be limited to no more than 10,000 acres (40 km^2), stating that existing and planned transmission could accommodate only the corresponding amount of power generated. The DoD and Western Watersheds Project requested that the SEZ be eliminated because of conflicts with military operations and training and lack of sufficient groundwater resources.

The Southern Nevada Water Authority expressed concern for its groundwater development project ROWs and other areas identified for future ROWs that are located within the SEZ. Other comments requested changes to the transmission line and access road analysis.

[21] The Wilderness Society, Center for Biological Diversity, Defenders of Wildlife, Sierra Club-Toiyabe Chapter, National Parks Conservation Association, Natural Resources Defense Council, Soda Mountain Wilderness Council, and Sierra Trek submitted joint comments on the proposed Nevada SEZs. Those comments are attributed to The Wilderness Society et al.

C.4.3.3 Changes to the SEZ

The proposed Dry Lake Valley North SEZ has been reconfigured to eliminate 48,148 acres (195 km^2), mainly the northern portion of the SEZ (see Figure C.4.3-2). Excluding the northern portion of the SEZ will mitigate some potential impacts from development in the SEZ, including impacts on sage-grouse and other wildlife, impacts on grazing, and impacts on military operations. In addition, about 3,657 acres (15 km^2) of wetland and dry lake non-development areas within the SEZ boundaries were identified. The remaining developable area within the SEZ is 25,069 acres (101.5 km^2).

The lands eliminated from the proposed Dry Lake Valley North SEZ will be retained as solar right-of-way variance areas, because the BLM expects that individual projects could be sited in this area to avoid and/or minimize impacts. Any solar development within this area in the future would require appropriate environmental analysis.

C.4.3.4 Wilderness Character Status of SEZ

A recently maintained inventory of wilderness characteristics was used to determine whether public lands within the Dry Lake Valley North SEZ have wilderness characteristics. The finding of this inventory was that these lands do not contain wilderness characteristics.

C.4.3.5 Additional Data Collection Recommended

C.4.3.5.1 Lands and Realty

None.

C.4.3.5.2 Specially Designated Areas and Lands with Wilderness Characteristics

None.

C.4.3.5.3 Rangeland Resources

Livestock Grazing. The impact on grazing will be re-evaluated based on the revised boundaries.

Wild Horses and Burros. The potential for impacts on the HMA will likely be reduced as a result of the boundary revisions to the SEZ. Pre-disturbance surveys could be conducted within the SEZ to determine the use of the remaining SEZ area by wild horses and whether the

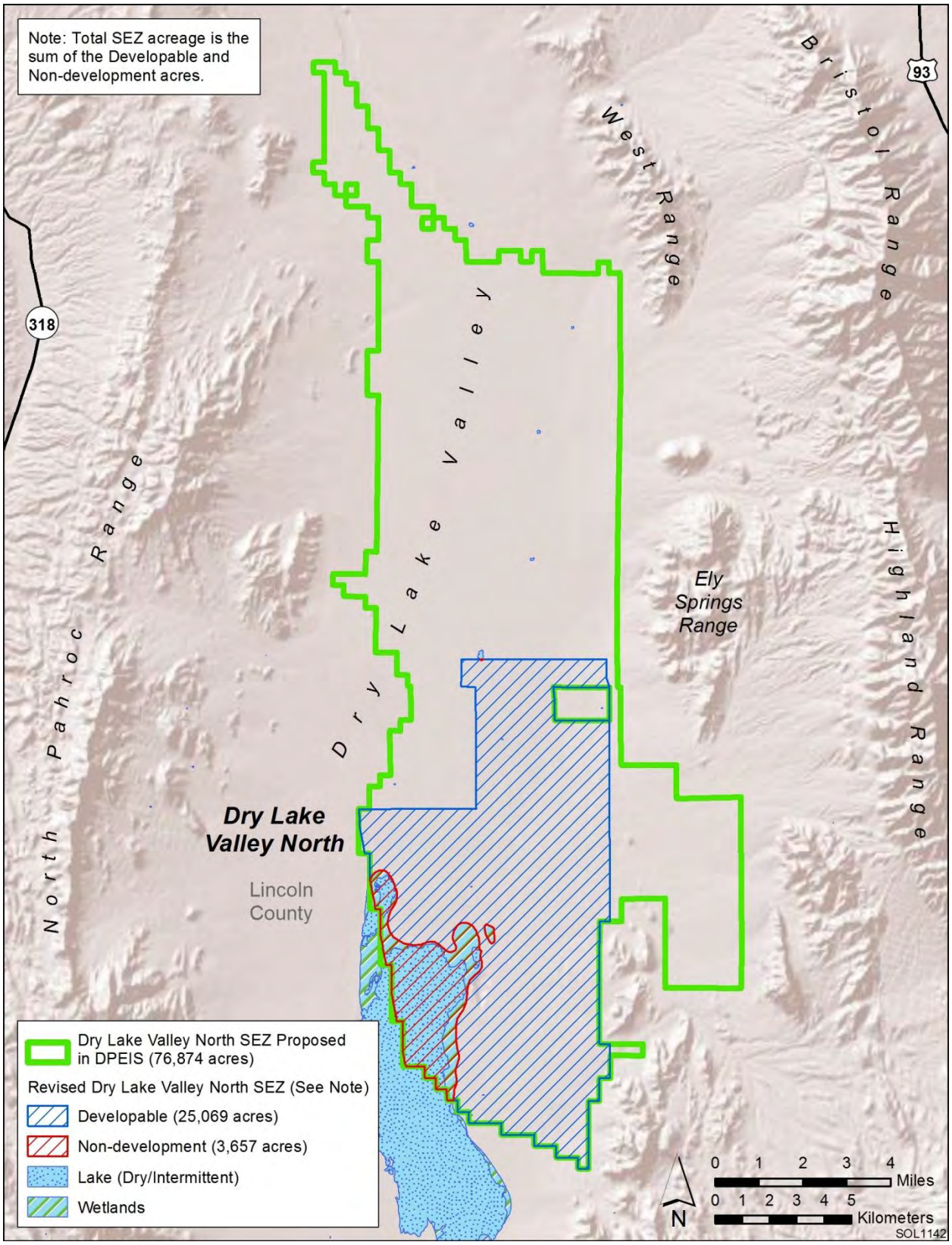

FIGURE C.4.3-2 Proposed Dry Lake Valley North SEZ as Described in this Supplement

area of the HMA not affected by proposed solar development could sustain the wild horses present within the HMA.

C.4.3.5.4 Recreation

The impacts on recreational use of the Silver State Trail and off-highway vehicle racing will be re-evaluated based on the revised boundaries.

C.4.3.5.5 Military and Civilian Aviation

The DoD has expressed continued concern regarding the potential impact of solar development in this SEZ on military operations. The U.S. Department of the Interior Bureau of Land Management (BLM) will continue to consult with the DoD regarding potential issues with military operations.

C.4.3.5.6 Geologic Setting and Soil Resources

None.

C.4.3.5.7 Minerals

Additional information on leasable and strategic minerals in the vicinity of the proposed SEZ will be provided in the Final Solar PEIS to inform the Department of the Interior's decision on a proposed 20-year withdrawal of SEZ lands.

C.4.3.5.8 Water Resources

The following additional data and actions would help further characterize potential impacts on water resources for the proposed Dry Lake Valley North SEZ. A more detailed discussion of each of these activities is included in the water resources action plan provided in Section C.7.2 of this appendix.

- Prepare a planning-level water resources inventory of the Dry Lake Valley basin.

- Identify additional ephemeral stream channels and alluvial fan features for non-development areas through consultation with Nevada BLM, Nevada Division of Water Resources (NDWR), U.S. Environmental Protection Agency, and U.S. Army Corps of Engineers (USACE) with a focus on:
  - Dry Lake,
  - Coyote Wash and its tributaries,

  - Ephemeral stream channels/unnamed washes located throughout the SEZ (draining from Ely Springs Range, Robber Roost Hills, Highland Range, Black Canyon Range, the Bluffs, Chief Range and Burnt Springs Range toward Dry Lake), and
  - Alluvial fan features in the southeastern portion of the SEZ.

- Perform field surveys and hydrologic analyses to support jurisdictional water determinations and floodplain identifications, if USACE consultation suggests field surveys are needed. Tasks may include:
  - Surveying Dry Lake and ephemeral channels identified previously for surface elevations, high water marks, and sediment conditions; and
  - Conducting hydrologic rainfall-runoff-routing analyses to identify 100 year floodplain areas.

- Coordinate with the USACE (Sacramento District) regarding jurisdictional water determinations for the SEZ. Water features to be considered include:
  - Dry Lake and
  - Ephemeral stream channels within the SEZ.

- Identify 100-year floodplain non-development areas for the SEZ. This task would require coordination with the Federal Emergency Management Agency and the following agencies:
  - NDWR (Floodplain Management Program) and
  - Lincoln County.

- Describe the formation of a stakeholder committee to conduct long-term monitoring of water resources. This activity would entail:
  - Identifying key stakeholder agencies,
  - Discussing general features of a monitoring program, and
  - Working with the U.S. Geological Survey to develop groundwater monitoring well design and numerical groundwater models.

- Perform groundwater modeling analyses for the Dry Lake Valley basin to estimate potential impacts of full build-out on groundwater pumping scenarios (according to estimated, technology-specific water requirements): Tasks include:
  - Develop a superposition-type groundwater model for the Dry Lake Valley basin; and
  - Assess the potential for drawdown impacts on water levels in the basin, other groundwater users, the carbonate aquifer system, and surface water-groundwater connectivity.

C.4.3.5.9 Ecological Resources

Vegetation and Plant Communities. The following additional data-gathering action would help further characterize potential impacts on vegetation and plant communities for the proposed Dry Lake Valley North SEZ:

- Identify and map the location and areal extent of desert dry washes, playa, greasewood flat, and wetland habitats within the SEZ. Identify and map the location and areal extent of these habitats, as well as riparian communities, outside the SEZ that could be impacted by hydrologic changes, including groundwater elevations, and changes in water, sediment, and contaminant inputs associated with runoff. Such efforts could help determine habitat characteristics, including water source, hydrologic regime, and dominant plant species.

Wildlife. The following additional data-gathering actions would help further characterize potential impacts on wildlife resources for the SEZ:

- Conduct pre-disturbance surveys within the SEZ to determine the use of the SEZ as a movement/migratory corridor or as important habitat for elk, mule deer, and pronghorn.

- Identify and map the location and areal extent of wash and playa habitats within the SEZ. These areas are important habitat for a number of wildlife species.

Aquatic Biota. Investigations recommended under the water resources action plan (Section C.4.3.5.8) would be useful in characterizing and protecting habitat available to aquatic biota. Washes and wetlands in the SEZ are typically dry and contain water only for brief periods following runoff from adjacent mountains. They may or may not contain aquatic biota; therefore, preliminary evaluations of these surface water features could be conducted to determine the potential for aquatic communities to be present.

Special Status Species. The following additional data-gathering actions would be useful in further characterizing and protecting habitat available to special status species:

- Conduct pre-disturbance surveys within the SEZ to determine the presence and abundance of those special status species that are (1) federally listed, proposed for listing, or candidates for listing under the Endangered Species Act; (2) protected by the state of Nevada[22]; or (3) designated as sensitive by

[22] State-protected species for the state of Nevada are those protected under *Nevada Revised Statutes* (NRS) 501.110 (animals) or NRS 527 (plants).

the Nevada BLM State Office. These species are listed in Table C.4.3-1. Surveys should focus on areas identified as potentially suitable, and the suitability of these habitats to support these special status species should be determined in the field. All field-determined suitable habitats for special status species should be mapped. Target species and survey protocols should be developed in coordination with the U.S. Fish and Wildlife Service (USFWS) and Nevada Department of Wildlife (NDOW).

The Draft Solar PEIS presents a table of special status species for which potential impacts need to be evaluated prior to development in the proposed Dry Lake Valley North SEZ. The list of species presented in Table 11.4.12.1-1 of the Draft Solar PEIS also includes rare species (ranked in the State of Nevada as S1 or S2 or listed as a species of concern by the USFWS). On the basis of design features presented in the Draft Solar PEIS, the potential for impacts on these additional species will also need to be addressed before development could occur in the SEZ.

- Identify and map the location and areal extent of desert playa and wash habitats within the area of direct effects, including habitat characteristics (such as water source, hydrologic regime, and dominant plant species) both within the habitat boundaries and in adjacent habitats. Species potentially associated with these habitats include Blaine fishhook cactus, Needle Mountains milkvetch, western snowy plover, Desert Valley kangaroo mouse, and Pahranagat Valley montane vole.

C.4.3.5.10 Air Quality and Climate

None.

C.4.3.5.11 Visual Resources

Visual resources will be re-evaluated for the Final Solar PEIS based on the revisions to boundaries described in Section C.4.3.3 of this Supplement. A summary of the Draft Solar PEIS visual contrast analysis for the Dry Lake Valley North SEZ is provided in Table C.4.3-2. This table includes only the resources that would be subject to moderate or strong visual contrast. The Draft Solar PEIS visual impact analysis predicted these levels of visual contrast from solar energy development in the Dry Lake Valley North SEZ for the following sensitive visual resource areas (SVRAs) and sensitive viewing locations (SVLs):

- Big Rocks WA
- Weepah Springs WA
- Chief Mountain SRMA

TABLE C.4.3-1 Special Status Species That May Occur near the Proposed Dry Lake Valley North SEZ[a]

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Plants			
Blaine fishhook cactus[d]	***Sclerocactus blaneii***	BLM-S; NV-P	Endemic to southeastern Nevada and southwestern Utah on alkaline substrates and volcanic gravels in valley bottoms. Elevation ranges between 5,100 and 5,300 ft.[e] There are only three known occurrences of this species. One of these occurrences is located in the Dry Lake Valley. About 20,150 acres[f] of potentially suitable habitat occurs within the SEZ region.
Eastwood milkweed	***Asclepias eastwoodiana***	BLM-S	Endemic to Nevada on public and private lands in Esmeralda, Lander, Lincoln, and Nye Counties in open areas on a wide variety of basic (pH usually >8) soils, including calcareous clay knolls, sand, carbonate, or basaltic gravels, or shale outcrops, generally barren and lacking competition. Frequently in small washes or other moisture-accumulating microsites at elevations between 4,700 and 7,100 ft. Known to occur on the SEZ. About 413,100 acres of potentially suitable habitat occurs within the SEZ region.
Long-calyx milkvetch	*Astragalus oophorus var. lonchocalyx*	BLM-S	Regionally endemic to the Great Basin in western Utah and eastern Nevada in pinyon-juniper woodlands, sagebrush, and mixed shrub communities at elevations between 5,800 and 7,500 ft. Nearest recorded occurrence is 8 mi[g] east of the SEZ. About 4,351,850 acres of potentially suitable habitat occurs within the SEZ region.
Needle Mountains milkvetch	*Astragalus eurylobus*	BLM-S	Gravel washes and sandy soils in alkaline desert and arid grasslands at elevations between 4,250 and 6,250 ft. Nearest recorded occurrence is 15 mi southeast of the SEZ. About 39,650 acres of potentially suitable habitat occurs within the SEZ region.
Pioche blazingstar	*Mentzelia argillicola*	BLM-S	Endemic to Nevada on dry, soft, silty clay soils on knolls and slopes with sparse vegetation consisting mainly of sagebrush. Nearest recorded occurrence is from Patterson Wash, approximately 12 mi east of the SEZ. About 2,869,000 acres of potentially suitable habitat occurs within the SEZ region.
Tiehm blazingstar	*Mentzelia tiehmii*	BLM-S	Endemic to Nevada on hilltops of white soil, sparsely vegetated white calcareous knolls and bluffs with scattered perennials. Nearest recorded occurrence is from the White River, approximately 7 mi west of the SEZ. About 2,326,100 acres of potentially suitable habitat occurs within the SEZ region.
Birds			
Ferruginous hawk	*Buteo regalis*	BLM-S	Winter resident in grasslands, sagebrush and saltbrush habitats, as well as the periphery of pinyon-juniper woodlands. Nests in tall trees or on rock outcrops along cliff faces. Known to occur in Lincoln County, Nevada. About 2,071,600 acres of potentially suitable habitat occurs within the SEZ region.

TABLE C.4.3-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Birds (Cont.)			
Prairie falcon	*Falco mexicanus*	BLM-S	Year-round resident in open habitats in mountainous areas, steppe, grasslands, or cultivated areas. Typically nests in well-sheltered ledges of rocky cliffs and outcrops. Known to occur in Lincoln County, Nevada. About 1,690,150 acres of potentially suitable habitat occurs within the SEZ region.
Swainson's hawk	*Buteo swainsoni*	BLM-S; NV-P	Summer breeding resident in the SEZ region in savannas, open pine-oak woodlands, grasslands, and cultivated lands. Nests in solitary trees, bushes, or small groves. Known to occur in Lincoln County, Nev. About 2,114,200 acres of potentially suitable habitat occurs within the SEZ region.
Western burrowing owl	*Athene cunicularia hypugaea*	BLM-S	Summer breeding resident in open grasslands and prairies, as well as disturbed sites such as golf courses, cemeteries, and airports. Nests in burrows constructed by mammals (especially prairie dogs and badgers). Known to occur in Lincoln County, Nevada. About 3,159,500 acres of potentially suitable habitat occurs within the SEZ region.
Western snowy plover	*Charadrius alexandrinus nivosus*	BLM-S; NV-P	Summer breeding resident on alkali flats around reservoirs and sandy shorelines. Nearest recorded occurrence is from the Adams-McGill Reservoir, approximately 23 mi northwest of the SEZ. About 66,000 acres of potentially suitable habitat occurs within the SEZ region.
Mammals			
Desert Valley kangaroo mouse	***Microdipodops megacephalus albiventer***	BLM-S; NV-P	Endemic to central Nevada in desert areas at playa margins and in dune habitats. Known to occur on the SEZ in association with the dry lake along the southwestern portion of the SEZ. About 1,257,700 acres of potentially suitable habitat occurs within the SEZ region.
Fringed myotis	*Myotis thysanodes*	BLM-S; NV-P	Year-round resident in a wide range of habitats including lowland riparian, desert shrub, pinyon-juniper, and sagebrush habitats. Roosts in buildings and caves. Known to occur in Lincoln County, Nevada. About 4,645,300 acres of potentially suitable habitat occurs within the SEZ region.
Nelson's bighorn sheep	*Ovis canadensis nelsoni*	BLM-S	Visually open, steep rocky terrain in mountainous habitats of the eastern Mojave and Sonoran Deserts. Rarely uses desert lowlands, but may use them as corridors for travel between mountain ranges. Known to occur in Lincoln County, Nevada. About 1,771,100 acres of potentially suitable habitat occurs within the SEZ region.
Pahranagat Valley montane vole	*Microtus montanus fucosus*	BLM-S; NV-P	Endemic to Lincoln County, Nevada, where it is restricted to springs in the Pahranagat Valley. Within that area, isolated populations utilize mesic montane and desert riparian patches. Nearest recorded occurrence is from Pahranagat Creek, approximately 27 mi southwest of the SEZ. About 23,900 acres of potentially suitable habitat occurs within the SEZ region.

TABLE C.4.3-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Mammals (Cont.)			
Pygmy rabbit	*Brachylagus idahoensis*	BLM-S; NV-P	Sagebrush-shrubland habitats throughout the SEZ region. Prefers loose soils to dig burrows. Nearest recorded occurrence is from BLM-administered lands approximately 20 mi northwest of the SEZ. About 1,325,950 acres of potentially suitable habitat occurs within the SEZ region.
Spotted bat	*Euderma maculatum*	BLM-S; NV-P	Year-round resident in forests and shrubland habitats. Uses caves and rock crevices for day roosting and winter hibernation. Nearest recorded occurrence is from the vicinity of Panaca, Nevada, approximately 13 mi east of the SEZ. About 3,952,400 acres of potentially suitable habitat occurs within the SEZ region.
Western small-footed myotis	*Myotis ciliolabrum*	BLM-S	Year-round resident in a variety of woodlands and riparian habitats at elevations below 9,000 ft. Roosts in caves, buildings, mines, and crevices of cliff faces. Known to occur in Lincoln County, Nevada. About 5,016,400 acres of potentially suitable habitat occurs within the SEZ region.

[a] The listings for (1) federally listed, proposed for listing, or candidates for listing under the ESA, (2) species protected by the state of Nevada, and (3) Nevada BLM State Office sensitive species have been updated since the release of the Draft Solar PEIS.

[b] BLM-S = listed as a sensitive species by the BLM; NV-P = protected in the state of Nevada under NRS 501.110 (animals) or NRS 527 (plants).

[c] For plant and invertebrate species, potentially suitable habitat was determined by using California Regional Gap Analysis Project (CAReGAP) and Southwest Regional Gap Analysis Project (SWReGAP) land cover types (USGS 2005, 2010). For reptile, bird, and mammal species, potentially suitable habitat was determined using CAReGAP and SWReGAP habitat suitability models as well as CAReGAP and SWReGAP land cover models. Area of potentially suitable habitat for each species is presented for the SEZ region, defined as the area within 50 mi (80 km) of the SEZ center.

[d] Species in bold text have been recorded or have designated critical habitat in the affected area.

[e] To convert ft to m, multiply by 0.3048.

[f] To convert acres to km^2, multiply by 0.004047.

[g] To convert mi to km, multiply by 1.609.

- Silver State Trail Scenic Highway
- U.S. 93.

The following steps could be taken to better understand potential impacts on these SVRAs and SVLs from solar development in the Dry Lake Valley North SEZ:

- Identify key observation points (KOPs) within these areas through working with the management agency or other local stakeholders.

TABLE C.4.3-2 Summary of Potential Visual Impacts on SVRAs and SVLs within the 25-mi (40-km) Viewshed of the Proposed Dry Lake Valley North SEZ

Management Area Category	SVRA/SVL within 25 mi[a] of SEZ	Total Acreage/ Mileage[a,b,c] of SVRA/SVL	Distance from SEZ at Point of Closest Approach[d]	Total Acreage/Mileage Visible within 25 mi[e]	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes[f]
WAs	Big Rocks	12,929 acres	8.2 mi southwest of the SEZ	1,590 acres	12.3	Weak to strong visual contrasts could be observed; visible area of the WA extends from approximately 9.1 to 12 mi from the southwestern boundary of the SEZ.
	Weepah Spring	51,309 acres	8.4 mi at the west of the SEZ	13,600 acres	26.5	Visual contrasts associated with solar facilities would depend on the numbers, types, sizes and locations and other visibility factors. Very weak to strong visual contrasts could be observed by WA visitors. Visible area of the WA extends to approximately 15 mi from the western boundary of the SEZ.
Scenic Highway	U.S. 93	149 mi	8.1 mi east and south of the SEZ	10 mi	6.7	Moderate visual contrasts could be observed within the SEZ by travelers on U.S. 93. There would be a full view from U.S. 93 in both directions.
	Silver State Trail[g]	260 mi	Less than 3 mi from the SEZ	100 mi	38.5	Strong visual contrasts could be observed by travelers because of the close proximity of the byway to the SEZ and the elevated viewpoints from some locations. Minimal to weak contrasts are anticipated at the longest distances.

TABLE C.4.3-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi[a] of SEZ	Total Acreage/ Mileage[a,b,c] of SVRA/SVL	Distance from SEZ at Point of Closest Approach[d]	Total Acreage/Mileage Visible within 25 mi[e]	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes[f]
SRMA	Chief Mountain	111,151 acres	Adjacent to portions of the southeast boundary of the SEZ	39,076 acres	35.2	Strong visual contrasts could be observed. The actual contrast levels experienced would depend on project location, the types of solar facilities and their designs, and other visibility factors. The visible area of the SRMA extends from point of closest approach to 10 mi into the SRMA from the southeast boundary of the SEZ.

[a] To convert mi to km, multiply by 1.609.

[b] To convert acres to km^2, multiply by 0.004047.

[c] Mileage (within all columns) is used only for trails or roads, unless otherwise specified.

[d] Distances at the point of closest approach are based on the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries would result in changes to these calculations.

[e] The total acreage/mileage visible within 25 mi (40 km) of the SEZ is based on the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries would result in changes to these acreages/mileages, as well as the percentage of total acreage/mileage visible within 25 mi (40 km) of the SEZ.

[f] The assessment of impacts is based the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries may result in reduced impacts in some of the SVRAs/SVLs due to the reduction in the overall footprint of the SEZ.

[g] Length of Silver State Trail: Nevada Commission on Tourism (2011).

- Conduct viewshed analyses from the KOPs to determine how much of the SEZ would be in view from each KOP.

- As deemed necessary, based on viewshed analysis results, prepare wireframe Google Earth™ visualizations of hypothetical solar facilities in the SEZ depicting the 80% development scenario to better estimate potential impacts.

This additional analysis may help judge potential visual contrast more accurately for most KOPs. For KOPs of particularly high sensitivity, a site visit with photography and superimposition of the wireframe models onto the photos might be required or desired.

C.4.3.5.12 Acoustic Environment

None.

C.4.3.5.13 Paleontological Resources

The BLM Regional Paleontologist will be contacted to determine whether additional information is available regarding Potential Fossil Yield Classification (PFYC) identifications in Nevada. A preliminary paleontological survey could be conducted to determine the PFYC) of the SEZ, in order to update the temporary assignment of PFYC Class 3b used in the Draft Solar PEIS.

C.4.3.5.14 Cultural Resources and Native American Concerns

Approximately 2.8% of the original proposed Dry Lake Valley North SEZ footprint has been surveyed for cultural resources, identifying 53 sites within the SEZ. Four of the 53 sites are potentially eligible for listing in the *National Register of Historic Places* (NRHP), and either the remaining 51 sites are not eligible for listing in the NRHP or their eligibility has not been determined. For the revised footprint, approximately 3% has been surveyed (880 acres [3.6 km^2]), and 21 sites have been recorded. The four sites that are potentially eligible are still in the revised SEZ footprint. These four sites are prehistoric, temporary camps associated with the resource procurement and processing potential of the dry lake. At least 153 sites have been recorded within 5 mi (8 km) of the original SEZ footprint. As with other SEZs, dune areas and areas along washes and dry lakes have the highest potential for containing significant archaeological resources within the SEZ. Several culturally important areas have also been identified near the SEZ, including specific mountain ranges and peaks, valleys, trails, and water sources. The destruction or degradation of important plant and water resources, and the destruction of habitat or impediments to the movement of culturally important wildlife, are also potential impacts of concern within the SEZ.

The following additional data collection efforts could reduce the uncertainty about potential impacts on cultural resources:

- Conduct Class I literature file search to better understand (1) the site distribution pattern in the vicinity of the SEZ, (2) potential trail networks through existing ethnographic reports, and (3) overall cultural sensitivity of the landscape.

- Conduct a Class II reconnaissance level stratified random sample survey of the SEZ to obtain a 10% sample (roughly 1,992 acres [8 km^2]).[23] If the approximately 880 acres (3.6 km^2) previously surveyed meets current survey standards, then approximately 1,112 acres (4.5 km^2) of survey could satisfy a 10% sample. Areas of interest, such as dune areas and along washes and the dry lake, as determined through a Class I review, should also be identified prior to establishing the survey design and sampling strategy. If appropriate, some subsurface testing of dune areas should be considered in the sampling strategy as well.

- Prepare a cultural sensitivity map based on results of the Class I survey and Class I review.

- Continue government-to-government consultation as described in Section 2.4.3, including follow-up to recent ethnographic studies with Tribes not included in the original studies to determine whether those Tribes have similar concerns. The Dry Lake Valley North SEZ falls in the traditional use area of primarily the Southern Paiute, but also the Western Shoshone. Potential topics presented in the Draft Solar PEIS to be discussed during consultation include Meadow Valley Wash and surrounding mountains, trail systems, mountain springs and other water sources, mineral resources, burial sites, ceremonial areas, rock art areas, and plant and animal resources.

C.4.3.5.15 Socioeconomics and Environmental Justice

None.

C.4.3.5.16 Cumulative Impact Considerations

None.

[23] The BLM plans to conduct a Class II survey of 5% of this SEZ prior to the Final Solar PEIS. Additional areas could be surveyed as funding becomes available.

C.4.4 Gold Point

C.4.4.1 Summary of Potential Impacts Identified in the Draft Solar Programmatic Environmental Impact Statement (PEIS)

The proposed Gold Point solar energy zone (SEZ), as presented in the Draft Solar PEIS, had a total area of 4,810 acres (19 km^2). It is located in Esmeralda County in southwestern Nevada (Figure C.4.4-1). The nearest residences are in Gold Point, a well-preserved ghost town and point of interest for tourists about 2 mi (3.2 km) south of the SEZ. The town is located on U.S. Department of the Interior Bureau of Land Management (BLM)-administered lands; it thrived in the early 1900s, but most of the town was abandoned in the 1940s when mining operations ceased. The town currently has only a few occupied residences

The Draft Solar PEIS identified a 120-kV transmission line 22 mi (35 km) west of the SEZ as the nearest point for connection of the SEZ to the grid. Updated data indicates that a 345-kV proposed line adjacent to the SEZ has become operational. Details on the revised transmission impact assessment to be included in the Final Solar PEIS are provided in Section C.7.1 of this appendix. Analysis of transmission lines and/or access roads will be completed, as necessary, as part of the project-specific environmental reviews (see Section 2.2.2.2.2 of this Supplement).

Potential adverse impacts identified in the Draft Solar PEIS included the following:

- New transmission lines could cause visual impacts on specially designated areas.

- Light from solar facilities could adversely affect night sky viewing opportunities from Death Valley National Park and BLM Wilderness Study Areas (WSAs).

- Wild horse and burros would incur small direct and indirect impacts from the construction of the assumed transmission line in the Goldfield Herd Management Area.

- Development could encroach into military training route airspace that crosses the SEZ; structures higher than 50 ft (15 m) above ground level may present unacceptable electromagnetic compatibility concerns for the Nevada Test and Training Range test mission.

- Impacts on soil resources (e.g., soil compaction, soil horizon mixing, soil erosion and deposition by wind and runoff, sedimentation, and soil contamination) could occur.

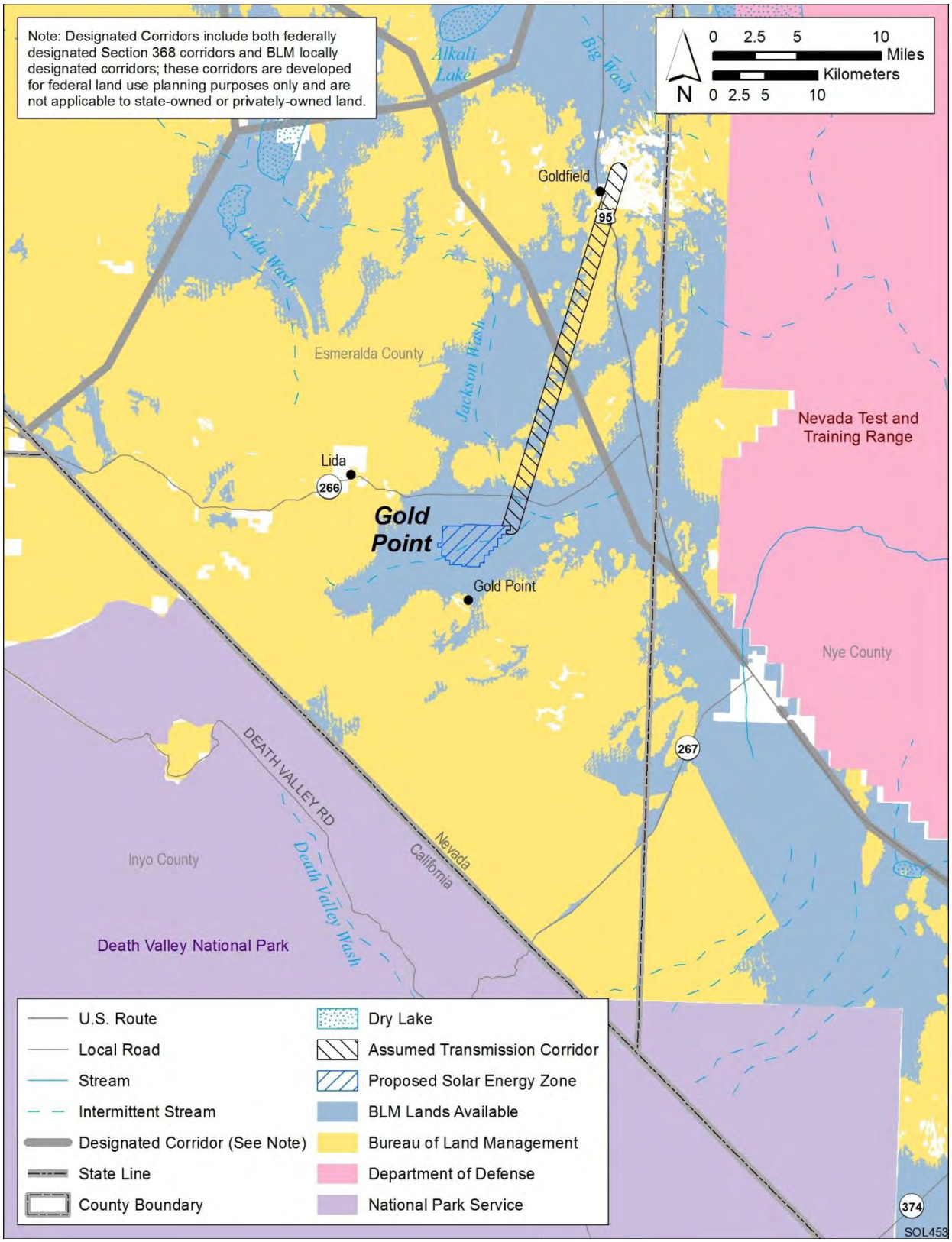

FIGURE C.4.4-1 Proposed Gold Point SEZ as Presented in the Draft Solar PEIS (Note: Assumed transmission corridor from the Draft Solar PEIS is no longer applicable.)

- Groundwater use would deplete the aquifer to the extent that, at a minimum, wet-cooling options would not be feasible.

- Clearing of a large portion of the proposed SEZ could adversely affect dry wash, playa, greasewood flat, and riparian habitats, depending on the amount of available habitat disturbed. The establishment of noxious weeds could result in habitat degradation. Deposition of fugitive dust could cause reduced productivity or changes in plant community structure.

- Potentially suitable habitat for 21 special status species and more than 125 wildlife species occurs in the affected area of the proposed SEZ. For most of these species, less than 1% of the potentially suitable habitat in the region occurs in the area that would be directly affected by development.

- If aquatic biota are present in intermittent or ephemeral streams in the SEZ, they could be affected by the direct removal of these surface water features within the construction footprint. If present, aquatic biota in surface water features could also be affected by a decline in habitat quantity and quality due to water withdrawals and changes in drainage patterns, as well as increased sediment and contaminant inputs associated with ground disturbance and construction activities.

- Temporary exceedances of ambient air quality standards for particulate matter at the SEZ boundaries are possible during construction. These high concentrations, however, would be limited to the immediate area surrounding the SEZ boundary.

- Although the SEZ is in an area of low scenic quality, moderate visual contrasts could be observed by visitors to the Queer Mountain WSA and viewers on Magruder Mountain. Strong visual contrasts would be expected for nearby viewpoints on State Route 266 and within the community of Gold Point.

- During operations, noise levels at the nearest residences would be higher than the U.S. Environmental Protection Agency (EPA) guideline level if concentrating solar power facilities with energy storage technologies (which could extend the daily operational time by 6 hours or more) or dish engine facilities were used at the SEZ.

- The potential for impacts on significant paleontological and cultural resources is unknown. It is possible that there will be Native American concerns about the potential visual and other effects of solar development on specific resources within the SEZ, including culturally important landscapes.

C.4.4.2 Summary of Comments Received

Some of the comments received on the proposed Gold Point SEZ were in support of identifying the area as an SEZ, while others were in favor of eliminating it. Residents of the town of Gold Point wanted the SEZ eliminated because of impacts on the town and its residents. The Nature Conservancy and Western Watersheds recommended eliminating the SEZ due to pristine conditions and lack of water (or alternatively, reducing its size to include only the degraded area near U.S. 95 and State Route 266). The Nature Conservancy also recommended eliminating the SEZ because the area is remote and ecologically intact and contains pronghorn and sage grouse habitat.

Other environmental groups supported designation of the area as an SEZ but requested that the proposed transmission line run along existing highways to avoid fragmentation and impacts on recreation, and suggested that the BLM may need to scale back the peak construction year and full build-out scenarios, given limited water availability (The Wilderness Society,[24] Center for Biological Diversity, Defenders of Wildlife, Sierra Club—Toiyabe Chapter, National Parks Conservation Association, and Natural Resources Defense Council). The Wilderness Society et al. also suggested that the project design take into consideration access to forage and water for antelope, particularly during dry periods.

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The U.S. Department of Defense (DoD) reiterated concerns over encroachment into military training route airspace and structures higher than 50 ft (15 m) that were expressed during scoping for the Draft Solar PEIS. Esmeralda County commented that the Draft Solar PEIS did not include input from the county, and it provided recommended alternate locations for renewable energy development. The Nevada Wilderness Project requested that the BLM include a study of the flood potential of the unnamed wash that bisects the SEZ for the Final Solar PEIS.

C.4.4.3 Changes to the SEZ

No boundary revisions were identified for the proposed SEZ. However, areas specified for non-development under SEZ-specific design features were mapped, where data were available. For the proposed Gold Point SEZ, 214 acres (0.87 km^2) of a significant unnamed intermittent stream passing east–west through the center of the SEZ were identified as non-development areas (Figure C.4.4-2). The remaining developable area within the SEZ is 4,596 acres (18.6 km^2).

[24] The Wilderness Society, Center for Biological Diversity, Defenders of Wildlife, Sierra Club-Toiyabe Chapter, National Parks Conservation Association, Natural Resources Defense Council, Soda Mountain Wilderness Council, and Sierra Trek submitted joint comments on the proposed Nevada SEZs. Those comments are attributed to The Wilderness Society et al.

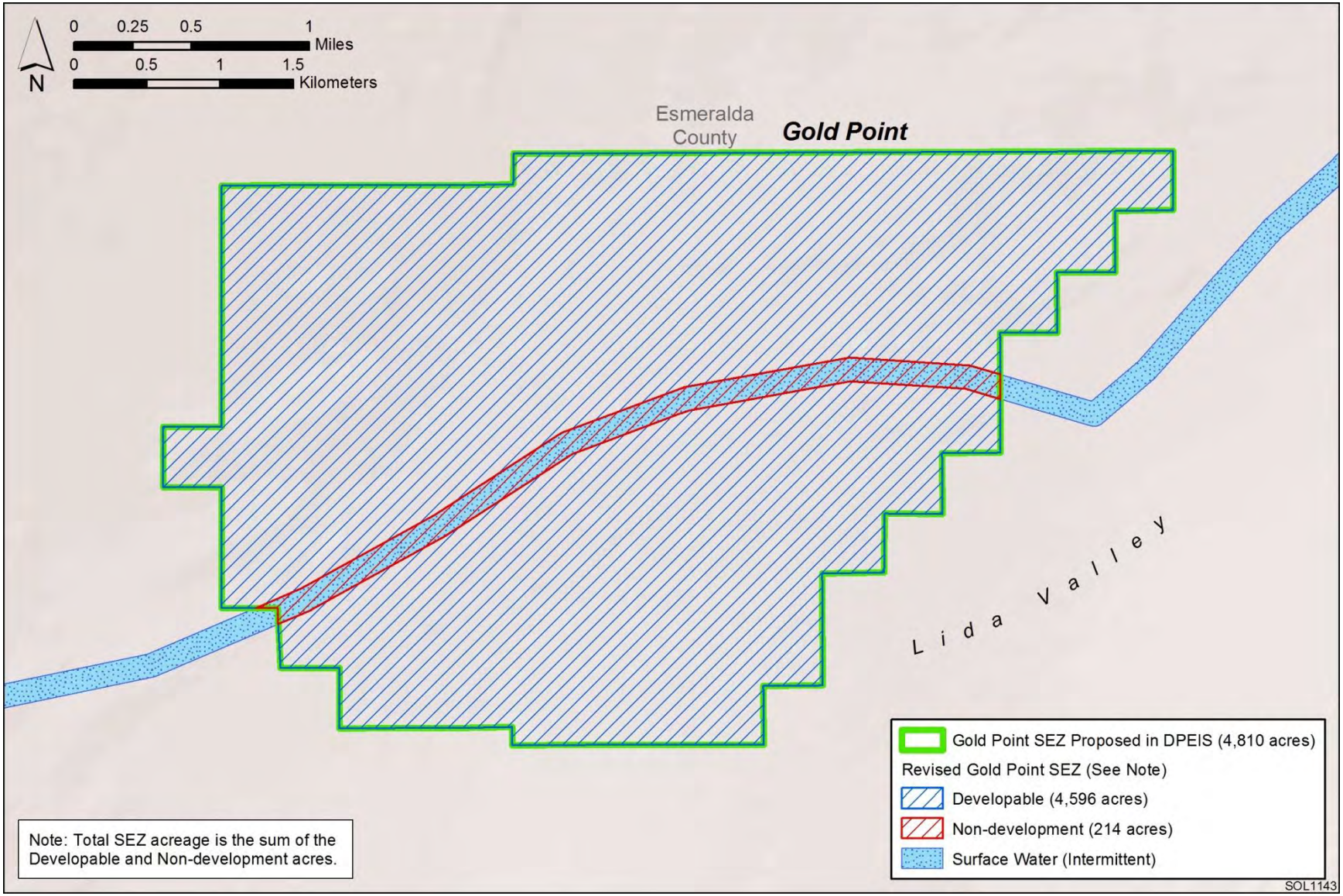

FIGURE C.4.4-2 Proposed Gold Point SEZ as Described in this Supplement

C.4.4.4 Wilderness Character Status of SEZ

A recently maintained inventory of wilderness characteristics was used to determine whether public lands within the Gold Point SEZ have wilderness characteristics. The finding of this inventory was that these lands do not contain wilderness characteristics.

C.4.4.5 Additional Data Collection Recommended

C.4.4.5.1 Lands and Realty

None.

C.4.4.5.2 Specially Designated Areas and Lands with Wilderness Characteristics

None.

C.4.4.5.3 Rangeland Resources

Livestock Grazing. None.

Wild Horses and Burros. None.

C.4.4.5.4 Recreation

None.

C.4.4.5.5 Military and Civilian Aviation

The DoD has expressed continued concern regarding the potential impact of solar development in this SEZ on military operations. The BLM will continue to consult with the DoD regarding potential issues with military operations.

C.4.4.5.6 Geologic Setting and Soil Resources

None.

C.4.4.5.7 Minerals

Additional information on leasable and strategic minerals in the vicinity of the proposed SEZ will be provided in the Final Solar PEIS to inform the Department of the Interior's decision on a proposed 20-year withdrawal of SEZ lands.

C.4.4.5.8 Water Resources

The following additional data and actions would help further characterize potential impacts on water resources for the proposed Gold Point SEZ. A more detailed discussion of each of these activities is included in the water resources action plan provided in Section C.7.2 of this appendix.

- Prepare a planning-level water resources inventory of the Lida Valley Basin.

- Identify additional ephemeral stream channels and alluvial fan features for non-development areas through consultation with BLM Nevada, Nevada Division of Water Resources (NDWR), the EPA, and U.S. Army Corps of Engineers (USACE) with a focus on:
  - Tributaries to the unnamed intermittent stream non-development area, and
  - Alluvial fan base features located in the northwestern portion of the SEZ.

- Perform field surveys and hydrologic analyses to support jurisdictional water determinations and floodplain identifications. Tasks include:
  - Surveying tributaries of the unnamed intermittent stream and the alluvial fan base in the northwestern portion of SEZ for surface elevations, high water marks, sediment conditions, and
  - Conducting hydrologic rainfall-runoff-routing analyses to identify 100-year floodplain areas.

- Coordinate with the USACE (Sacramento District) regarding jurisdictional water determinations for the SEZ. Water features to be considered include:
  - The unnamed intermittent stream.

- Identify 100-year floodplain non-development areas (if they exist) for the unnamed intermittent stream. This task would require coordination with the Federal Emergency Management Agency and the following agencies:
  - NDWR (Floodplain Management Program), and
  - Esmeralda County.

- Describe the formation of a stakeholder committee to conduct long-term monitoring of water resources. This activity would entail:
  - Identifying key stakeholder agencies,
  - Discussing general features of a monitoring program, and
  - Working with the U.S. Geological Survey to develop groundwater monitoring well design and numerical groundwater models.

C.4.4.5.9 Ecological Resources

Vegetation and Plant Communities. The following additional data-gathering action would help further characterize potential impacts on vegetation and plant communities for the proposed Gold Point SEZ:

- Identify and map the location and areal extent of desert riparian, desert dry wash, greasewood flat, and playa habitats within the SEZ. Identify and map the location and areal extent of these habitats outside the SEZ that may be affected by hydrologic changes, including groundwater elevations, and changes in water, sediment, and contaminant inputs associated with runoff. Such efforts could help determine habitat characteristics, including water source, hydrologic regime, and dominant plant species.

Wildlife. The following additional data-gathering actions would help further characterize potential impacts on wildlife resources for the SEZ:

- Conduct pre-disturbance surveys within the SEZ to determine the use of the SEZ as a movement/migratory corridor or as important habitat for mule deer.

- Identify and map the location and areal extent of wash and playa habitat within the SEZ. These areas are important habitat for a number of wildlife species.

Aquatic Biota. Investigations recommended under the water resources action plan (Section C.4.4.5.8) would be useful in characterizing and protecting habitat available to aquatic biota. Most washes and dry lakes in the SEZ are typically dry and contain water only for brief periods following precipitation. They may or may not contain aquatic biota; therefore, preliminary evaluations of these surface water features could be conducted to determine the potential for aquatic communities to be present. Any aquatic biota found in these features would likely be desiccation-adapted aquatic invertebrates typical of the region. The primary value of these features may be to nonaquatic animals that consume aquatic biota within the SEZ.

Special Status Species. The following additional data-gathering actions would be useful in further characterizing and protecting habitat available to special status species:

- Conduct pre-disturbance surveys within the SEZ to determine the presence and abundance of those special status species that are (1) federally listed, proposed for listing, or candidates for listing under the Endangered Species Act (ESA); (2) protected by the State of Nevada; or (3) designated as sensitive by the Nevada BLM State Office. These species are listed in Table C.4.4-1. Surveys should focus on areas identified as potentially suitable, and the

TABLE C.4.4-1 Special Status Species That May Occur in the Vicinity of the Proposed Gold Point SEZ[a]

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Plants			
Eastwood milkweed	*Asclepias eastwoodiana*	BLM-S	Endemic to Nevada in Esmeralda, Lander, Lincoln, and Nye Counties in open areas on a wide variety of basic (pH usually >8) soils, including calcareous clay knolls, sand, carbonate or basaltic gravels, or shale outcrops, generally barren and lacking competition. Frequently occurs in small washes or other moisture-accumulating microsites at elevations between 4,700 and 7,100 ft.[d] Nearest recorded occurrence is 30 mi[e] northeast of the SEZ. About 37,900 acres[f] of potentially suitable habitat occurs in the SEZ region.
Holmgren lupine	*Lupinus holmgrenianus*	BLM-S	Inhabits dry desert slopes, washes, and valleys on volcanic substrates, in association with sagebrush and pinyon-juniper woodland. Elevation ranges between 4,600 and 8,200 ft. Nearest recorded occurrence is 9 mi west of the SEZ. About 119,700 acres of potentially suitable habitat occurs in the SEZ region.
Tonopah pincushion cactus	*Sclerocactus nyensis*	BLM-S; NV-P	Endemic to Esmeralda and Nye Counties, Nevada, on dry rocky soils and low outcrops of rhyolite, tuff, and possibly other rock types, on gentle slopes in open areas or under shrubs in the upper salt desert and lower sagebrush zones. Elevation ranges between 5,700 and 5,800 ft. Known to occur in Esmeralda County, Nevada. About 2,370,300 acres of potentially suitable habitat occurs in the SEZ region.
Birds			
Ferruginous hawk	*Buteo regalis*	BLM-S	Winter resident in project area in grasslands, sagebrush and saltbrush habitats, as well as the periphery of pinyon-juniper woodlands throughout the project area. Known to occur in Esmeralda County, Nevada. About 790,000 acres of potentially suitable habitat occurs in the SEZ region.
Greater sage-grouse	*Centrocercus urophasianus*	ESA-C; BLM-S	Plains, foothills, and mountain valleys dominated by sagebrush. Lek sites are located in relatively open areas surrounded by sagebrush or in areas where sagebrush density is low. Nesting usually occurs on the ground where sagebrush density is higher. Some populations may travel up to 60 mi between summer and winter habitats. Known to occur in Esmeralda County, Nevada. About 312,800 acres of potentially suitable habitat occurs in the SEZ region.
Prairie falcon	*Falco mexicanus*	BLM-S	Year-round resident in the project area, primarily in open habitats in mountainous areas, steppe, grasslands, or cultivated areas. Nests in well-sheltered ledges of rocky cliffs and outcrops. Known to occur in Esmeralda County, Nevada. About 2,387,300 acres of potentially suitable habitat occurs in the SEZ region.
Swainson's hawk	*Buteo swainsoni*	BLM-S; NV-P	Summer breeding resident in the SEZ region. Savanna, open pine-oak woodlands, grasslands, and cultivated lands. Nests typically in solitary trees, bushes, or small groves; sometimes nests near urban areas. Known to occur in Esmeralda County, Nevada. About 735,600 acres of potentially suitable habitat occurs in the SEZ region.

TABLE C.4.4-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Birds (Cont.)			
Western burrowing owl	*Athene cunicularia hypugaea*	BLM-S	Open grasslands and prairies, as well as disturbed sites such as golf courses, cemeteries, and airports throughout the SEZ region. Nests in burrows constructed by mammals (prairie dog, badger, etc.). Known to occur in Esmeralda County, Nevada. About 3,082,700 acres of potentially suitable habitat occurs in the SEZ region.
Mammals			
Brazilian free-tailed bat	*Tadarida brasiliensis*	BLM-S; NV-P	Year-round resident in project area. Forages in desert grassland, old fields, savanna, shrubland, and woodland habitats as well as urban areas. Roosts in old buildings, caves, mines, and hollow trees. Nearest recorded occurrence is 15 mi west of the SEZ. About 2,651,850 acres of potentially suitable habitat occurs in the SEZ region.
Fringed myotis	*Myotis thysanodes*	BLM-S; NV-P	Year-round resident in project area. Wide range of habitats, including lowland riparian, desert shrub, pinyon-juniper, and sagebrush habitats. Roosts in buildings and caves. Known to occur in Esmeralda County, Nevada. About 3,051,200 acres of potentially suitable habitat occurs in the SEZ region.
Nelson's bighorn sheep	*Ovis canadensis nelsoni*	BLM-S	Visually open, steep rocky terrain in mountainous habitats of the eastern Mojave and Sonoran Deserts in California. Rarely uses desert lowlands but may use them as corridors for travel between mountain ranges. Known to occur in Esmeralda County, Nevada. About 941,500 acres of potentially suitable habitat occurs in the SEZ region.
Pale kangaroo mouse	*Microdipodops pallidus*	NV-P	Known from southwestern Nevada and southeastern California. Inhabits fine sands in alkali sink and desertscrub dominated by shadscale (*Atriplex confertifolia*) or big sagebrush (*Artemisia tridentata*). Often burrows in areas of soft, windblown sand piled at the bases of shrubs. Known to occur in Esmeralda County, Nevada. About 1,251,250 acres of potentially suitable habitat occurs in the SEZ region.
Pallid bat	*Antrozous pallidus*	BLM-S; NV-P	Year-round resident in project area. Low-elevation desert communities, including grasslands, shrublands, and woodlands. Day roosts in caves, crevices, and mines. Nearest recorded occurrence is 15 mi west of the SEZ. About 2,616,400 acres of potentially suitable habitat occurs in the SEZ region.
Silver-haired bat	*Lasionycteris noctivagans*	BLM-S	Year-round resident in project area. Primarily high-elevation (1,600 to 8,500 ft) forested areas comprising aspen, cottonwood, white fir, pinyon-juniper, subalpine fir, willow, and spruce communities. Roost and nursery sites occur in tree foliage, cavities, or under loose bark. Rarely hibernates in caves. Nearest recorded occurrence is 15 mi west of the SEZ. About 2,609,400 acres of potentially suitable habitat occurs in the SEZ region.
Spotted bat	*Euderma maculatum*	BLM-S; NV-P	Year-round resident in project area. Near forests and shrubland habitats throughout the SEZ region. Uses caves and rock crevices for day roosting and winter hibernation. Nearest recorded occurrence is 15 mi west of the SEZ. About 2,605,300 acres of potentially suitable habitat occurs in the SEZ region.

TABLE C.4.4-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Mammals (Cont.)			
Townsend's big-eared bat	*Corynorhinus townsendii*	BLM-S; NV-P	Year-round resident in project area. Near forests and shrubland habitats below 9,000-ft elevation throughout the SEZ region. Roosts and hibernates in caves, mines, and buildings. Nearest recorded occurrence is 8 mi west of the SEZ. About 2,347,800 acres of potentially suitable habitat occurs in the SEZ region.
Western small-footed myotis	*Myotis ciliolabrum*	BLM-S	Year-round resident in project area. Variety of woodlands and riparian habitats at elevations below 9,000 ft. Roosts in caves, buildings, mines, and crevices of cliff faces. Nearest recorded occurrence is 9 mi south of the SEZ. About 3,374,000 acres of potentially suitable habitat occurs in the SEZ region.

[a] The listings for (1) federally listed, proposed for listing, or candidates for listing under the ESA, and (2) Nevada BLM State Office sensitive species have been updated since the release of the Draft Solar PEIS.

[b] BLM-S = listed as a sensitive species by the BLM; ESA-C = candidate for listing under the ESA; NV-P = protected in the state of Nevada under *Nevada Revised Statutes* (NRS) 501.110 (animals) or NRS 527 (plants).

[c] For plant species, potentially suitable habitat was determined by using Southwest Regional Gap Project (SWReGAP) land cover types (USGS 2005). For terrestrial vertebrate species, potentially suitable habitat was determined by using SWReGAP habitat suitability and land cover models. Area of potentially suitable habitat for each species is presented for the SEZ region, which is defined as the area within 50 mi (80 km) of the SEZ center.

[d] To convert ft to m, multiply by 0.3048.

[e] To convert mi to km, multiply by 1.609.

[f] To convert acres to km^2, multiply by 0.004047.

suitability of these habitats to support these special status species should be determined in the field. All field-determined suitable habitats for special status species should be mapped. Target species and survey protocols should be developed in coordination with the U.S. Fish and Wildlife Service and Nevada Department of Wildlife.

The Draft Solar PEIS presented a table of special status species for which potential impacts need to be evaluated prior to development in the proposed Gold Point SEZ. The list of species presented in Table 11.6.12.1-1 of the Draft Solar PEIS also includes species listed by the State of Nevada and species ranked by the State of Nevada as S1 or S2 or species of concern. Based on the design features presented in the Draft Solar PEIS, the potential for impacts on these additional species will also need to be addressed before development could occur in the SEZ.

- Identify and map the location and areal extent of ephemeral wetland habitats, including desert wash and playa habitats within the SEZ, including habitat

characteristics (such as water source, hydrologic regime, and dominant plant species), both within the wetland boundaries and in adjacent non-wetland habitats. A species potentially associated with these habitats includes the Eastwood milkweed.

C.4.4.5.10 Air Quality and Climate

None.

C.4.4.5.11 Visual Resources

A summary of the Draft Solar PEIS visual contrast analysis for the proposed Gold Point SEZ is provided in Table C.4.4-2. This table includes only the resources that would be subject to moderate or strong visual contrast. The Draft Solar PEIS visual impact analysis predicted these levels of visual contrast from solar energy development in the Gold Point SEZ for the following sensitive visual resource areas (SVRAs) and sensitive viewing locations (SVLs):

- Queer Mountain WSA
- Magruder Mountain
- State Route 266
- Community of Gold Point.

The following steps could be taken to better understand potential impacts on these SVRAs and SVLs from solar development in the Gold Point SEZ:

- Key observation points (KOPs) within these areas should be identified through working with the management agency or other local stakeholders.
- Viewshed analyses from the KOPs should be conducted to determine how much of the SEZ would be in view from each KOP.
- As deemed necessary, based on viewshed analysis results, wireframe Google Earth™ visualizations of hypothetical solar facilities in the SEZ depicting the 80% development scenario could be prepared to better estimate potential impacts.

This additional analysis may help judge potential visual contrast more accurately for most KOPs. For KOPs of particularly high sensitivity (e.g., the WSA), a site visit with photography and superimposition of the wireframe models onto the photos might be required or desired.

TABLE C.4.4-2 Summary of Potential Visual Impacts on SVRAs and SVLs within the 25-mi (40-km) Viewshed of the Proposed Gold Point SEZ

Management Area Category	SVRA/SVL within 25 mi[a] of SEZ	Total Acreage/ Mileage[a,b,c] of SVRA/SVL	Distance from SEZ at Point of Closest Approach[d]	Total Acreage/Mileage Visible within 25 mi	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes
WSAs	Queer Mountain	85,294 acres	7.0 mi south of the SEZ	1,276 acres	1.5	Moderate levels of visual contrast would be expected for some high-elevation viewpoints in the WSA, with weaker contrasts expected for lower elevation viewpoints in the WSA. Visible area of the WSA is about 8.7 to 12 mi from the southern boundary of the SEZ.
Other Areas of Interest (non-management areas)	Magruder Mountain	NA[e]	8 mi west of the SEZ	NA	NA	Because of the close proximity and elevated viewpoints on Magruder Mountain, moderate visual contrasts could be observed by viewers on the mountain. The mountain is a sacred site to the Timbisha Shoshone; the summit is about 4,000 ft higher than the SEZ.
	State Route 266	40 mi	Within the SEZ viewshed at distances from 2 to 9.5 mi	18 mi	45.0	Because State Route 266 passes within 2 mi of the SEZ, strong visual contrasts would be expected for nearby viewpoints on this highway. Moderate to weak levels of visual contrasts would be expected for viewpoints on State Route 266 farther from the SEZ.

TABLE C.4.4-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi[a] of SEZ	Total Acreage/ Mileage[a,b,c] of SVRA/SVL	Distance from SEZ at Point of Closest Approach[d]	Total Acreage/Mileage Visible within 25 mi	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes
Other Areas of Interest (non-management areas) (Cont.)	Gold Point	NA[e]	2 mi south of the SEZ	NA	NA	Strong visual contrasts would be expected for viewpoints within the community of Gold Point. Located less than 2 mi directly south of the SEZ. A detailed future site-specific NEPA analysis would be required to determine visibility precisely.

[a] To convert mi to km, multiply by 1.609.

[b] To convert acres to km^2, multiply by 0.004047.

[c] Mileage (within all columns) is used only for trails or roads, unless otherwise specified.

[d] Distances are based on the Draft PEIS analysis dated December 2010; any alterations to the SEZ boundaries may result in changes to the distance at the point of closest approach.

[e] NA = data not available.

C.4.4.5.12 Acoustic Environment

None.

C.4.4.5.13 Paleontological Resources

The BLM Regional Paleontologist will be contacted to determine whether additional information is available regarding Potential Fossil Yield Classification (PFYC) identifications in Nevada. A preliminary paleontological survey could be conducted to determine the PFYC of the SEZ, in order to update the temporary assignment of PFYC Class 2 used in the Draft Solar PEIS.

C.4.4.5.14 Cultural Resources and Native American Concerns

None of the proposed Gold Point SEZ has been surveyed for cultural resources; thus, absent specific information, impacts are unknown but possible. The SEZ is near the mining town of Gold Point, and historic resources pertaining to this mining area are possible in the SEZ. The cultural landscape of the SEZ is marked by Lida Valley, located between Mount Jackson, Jackson Ridge, Magruder Mountain, and Slate Ridge. Traditionally, camps would have been located near springs in the foothills, and the valley would have been used as a travel corridor. Many of these areas closest to the SEZ have been incorporated into the recently established Timbisha Shoshone Reservation in Lida. Magruder Mountain is reported to have cultural significance for the Timbisha, where the practice of selective burning encouraged the growth of particular plants. Other nearby resources include rockshelters, lithic scatters, and a historic Native American meeting place and ritual area. Potential impacts could include visual and auditory impacts on sacred sites as well as on the historic town site of Gold Point. The destruction or degradation of important plant resources, and the destruction of habitat or impediments to the movement of culturally important wildlife, are also potential impacts of concern within the SEZ.

The following additional data collection efforts could reduce the uncertainty about potential impacts on cultural resources:

- Conduct a Class I literature file search to better understand (1) the site distribution pattern in the vicinity of the SEZ, (2) potential trail networks through existing ethnographic reports, and (3) overall cultural sensitivity of the landscape.

- Conduct a Class II reconnaissance level stratified random sample survey of the SEZ to obtain a 10% sample (roughly 481 acres [1.95 km^2]).[25] Areas of interest, such as historic resources pertaining to mining, as determined through a Class I review, should also be identified prior to establishing the survey

[25] The BLM plans to conduct a Class II survey of 5% of this SEZ prior to the Final Solar PEIS. Additional areas could be surveyed as funding becomes available.

design and sampling strategy. If appropriate, some subsurface testing of dune areas should be considered in the sampling strategy as well.

- Prepare a cultural sensitivity map based on results of the Class II survey and Class I review.

- Continue with government-to-government consultation as described in Section 2.4.3, including follow-up to recent ethnographic studies with Tribes not included in the original studies to determine whether those Tribes have similar concerns. The Gold Point SEZ falls in the traditional use area of primarily the Western Shoshone and the Owens Valley branch of the Northern Paiute. The Timbisha Shoshone are the closest Western Shoshone with lands in Lida, Nevada, approximately 6 mi (9.7 km) from the Gold Point SEZ. Potential topics presented in the Draft Solar PEIS and/or in an ethnographic study with the Timbisha Shoshone Tribe to be discussed during consultation include Magruder Mountain, Mount Jackson, Stonewall Mountain, Pigeon Spring, The Doctor Rock, Lida Valley, spiritual trails, rock art sites, ceremonial areas and healing places, places of historic encounters, and plant and animal resources. The agencies value the information shared by the Tribes during the ethnographic study and will consider their input in striving to minimize the impacts of solar development in the SEZ. The completed ethnographic study will be available in its entirety on the Solar PEIS Web site (http://solareis.anl.gov). A summary of the contents of that report is also provided in the following text box.

Tribal Perspectives on the Significance of the Gold Point SEZ

The lands under consideration in the Draft Solar PEIS for the Gold Point SEZ region were traditionally occupied and used, aboriginally owned, and historically related to the Numic-speaking peoples of the Great Basin and western Colorado Plateau. Tribal representatives from the Timbisha Shoshone Tribe were involved in the Gold Point SEZ field consultations to represent the cultural interests of the Western Shoshone. These Numic-speaking people continue to stipulate that they are the American Indians responsible for the cultural resources (natural and man-made) in this study area because their ancestors were placed here by the Creator.

Traditional ecological understandings are carried from generation to generation through the recounting of origin stories occurring in mythic times and by strict cultural and natural resource conservation rules. The involved American Indian Tribal governments and their appointed cultural representatives have participated in this PEIS in order to explain the meaning and cultural centrality of the plants, animals, spiritual trails, healing places, and places of historic encounters that exist in these lands.

Western Shoshone Tribal representatives maintain that, in order to understand Western Shoshone connections to the SEZ, it must be placed in context with neighboring places and their associated cultural resources. During the ethnographic field sessions, Tribal representatives identified the Gold Point SEZ as being part of a larger ceremonial landscape. Specific geographic locations, even though located outside of the SEZ proper, contribute to the significance of the designated SEZ. Regional and world balancing ceremonies occurred at Pigeon Spring and possibly at Indian Spring. Other areas like Mount Jackson and Stonewall Mountain were identified places visited for power acquisition.

Tribal Perspectives on the Significance of the Gold Point SEZ (Cont.)

The Gold Point SEZ is located near mountains used in vision questing and ceremony. Timbisha representatives pointed out that the top of Mount Jackson contained ritually deposited items like arrowheads and pieces of pottery. Neighboring Magruder Mountain also was identified as a ceremonial area. It is the headwaters for the hydrological system that flows towards the Round Dance grounds at Pigeon Spring.

Western Shoshone cultural ties to this landscape are confirmed by the presence of a doctor rock, numerous ceremonial-use places, and sacred mountains. The Doctor Rock and the neighboring volcanic knoll were features of particular interest to the Timbisha Tribal representatives.

The Doctor Rock was formed when the Red Volcano erupted and unleashed materials in the form of volcanic bombs. This event likely occurred several thousand years ago. Places like these are considered sacred and powerful locations because they are formed directly from volcanic activity.

Western Shoshone medicine men, or puha'gants, healed and rebalanced an ill individual using the Doctor Rock. The puha'gant used his or her Puha (or energy) and the Puha of the rock and the volcano to aid in the curing ceremonies.

Places that contain the presence of volcanic activity are considered sacred and powerful locations. Western Shoshone people believe that volcanic events are moments when Puha deep inside the Earth is brought to the surface as a way for the land to renew itself or to be reborn. Volcanism is also a way for Puha to be distributed across a landscape.

The Gold Point SEZ region includes volcanic features such as Mount Jackson and Mount Jackson Ridge to the north, Magruder Mountains to the west, and Mount Dunfee to the southeast. It is located in a complex hydrological system that connects the local high volcanic mountains with the northern end of Death Valley. Tribal representatives identified trails along this hydrological system that connect Death Valley to ceremonial areas in the region.

Western Shoshone representatives noted that water is an important feature within the Gold Point SEZ region. Stonewall Mountain, a powerful volcano, serves as the headwaters of the Lida Valley hydrological system. This hydrological system flows through the region and ultimately into Death Valley.

During multiple field visits, Native American representatives identified 21 traditional use plants within the proposed project boundary. The presence of traditionally important animals in an area also contributes to the overall cultural importance of the area to Indian people.

Shoshone villages were located throughout the Lida Valley, particularly near Lida Spring and along the southeastern flank of Magruder Mountain. These communities were agricultural centers that supported people who traveled into the area for ceremony. Lida has been a well-documented place associated with Indian activity. In the 1930s, Julian Steward (1938) described the area as a hub that connected places such as Fish Lake Valley, Gold Mountain, Stonewall Valley, and Clayton Valley. Contemporary ethnographic studies link the Lida community with Tule Canyon and Pigeon Spring. The people of Lida frequently traveled the 10-mi (16-km) trail between these places for economic and ceremonial purposes.

C.4.4.5.15 Socioeconomics and Environmental Justice

None.

C.4.4.5.16 Cumulative Impact Considerations

None.

C.4.5 Millers

C.4.5.1 Summary of Potential Impacts Identified in the Draft Solar Programmatic Environmental Impact Statement (PEIS)

The proposed Millers solar energy zone (SEZ), as presented in the Draft Solar PEIS, had a total area of 16,787 acres (68 km^2). It is located in Esmeralda County in southern Nevada (Figure C.4.5-1). The nearest town is Tonopah, Nevada, about 15 mi (24 km) west in Nye County, with a population of approximately 1,500.

A U.S. Department of the Interior Bureau of Land Management (BLM)-designated transmission corridor is located within the SEZ and could limit development in the SEZ because solar facilities cannot be constructed under transmission lines. The discussion of impacts of solar energy development in the SEZ in the Draft Solar PEIS acknowledged that the presence of the corridor would reduce the amount of land available for solar power production, and that, conversely, full development of solar facilities within the SEZ would limit use of the transmission corridor.

The Draft Solar PEIS identified a 120-kV transmission line that passes through the SEZ as the nearest point for connection of the SEZ to the grid. The actual location of connection to the transmission grid could be different than that assumed in the Draft Solar PEIS. Details on the updated transmission impact assessment for SEZs to be included in the Final Solar PEIS are provided in Section C.7.1 of this appendix. Analysis of transmission lines and/or access roads will be completed, as necessary, as part of the project-specific environmental reviews (see Section 2.2.2.2.2 of this Supplement).

Potential adverse impacts identified in the Draft Solar PEIS included the following:

- Grazing on about 4% of the Monte Cristo allotment would be closed.
- A portion of an existing route of a competitive off-highway vehicle race course that passes through the SEZ would be closed.
- Development could encroach into military training route airspace that crosses the SEZ. Structures higher than 50 ft (15 m) above ground level may present unacceptable electromagnetic compatibility concerns for the Nevada Test and Training Range test mission.
- Impacts on soil resources (e.g., soil compaction, soil horizon mixing, soil erosion and deposition by wind and runoff, sedimentation, and soil contamination), as well as potential impacts on Crescent Dunes, could occur. Portions of the dry lake may not be a suitable location for construction.
- Groundwater use would deplete the aquifer to the extent that, at a minimum, wet-cooling options would not be feasible.

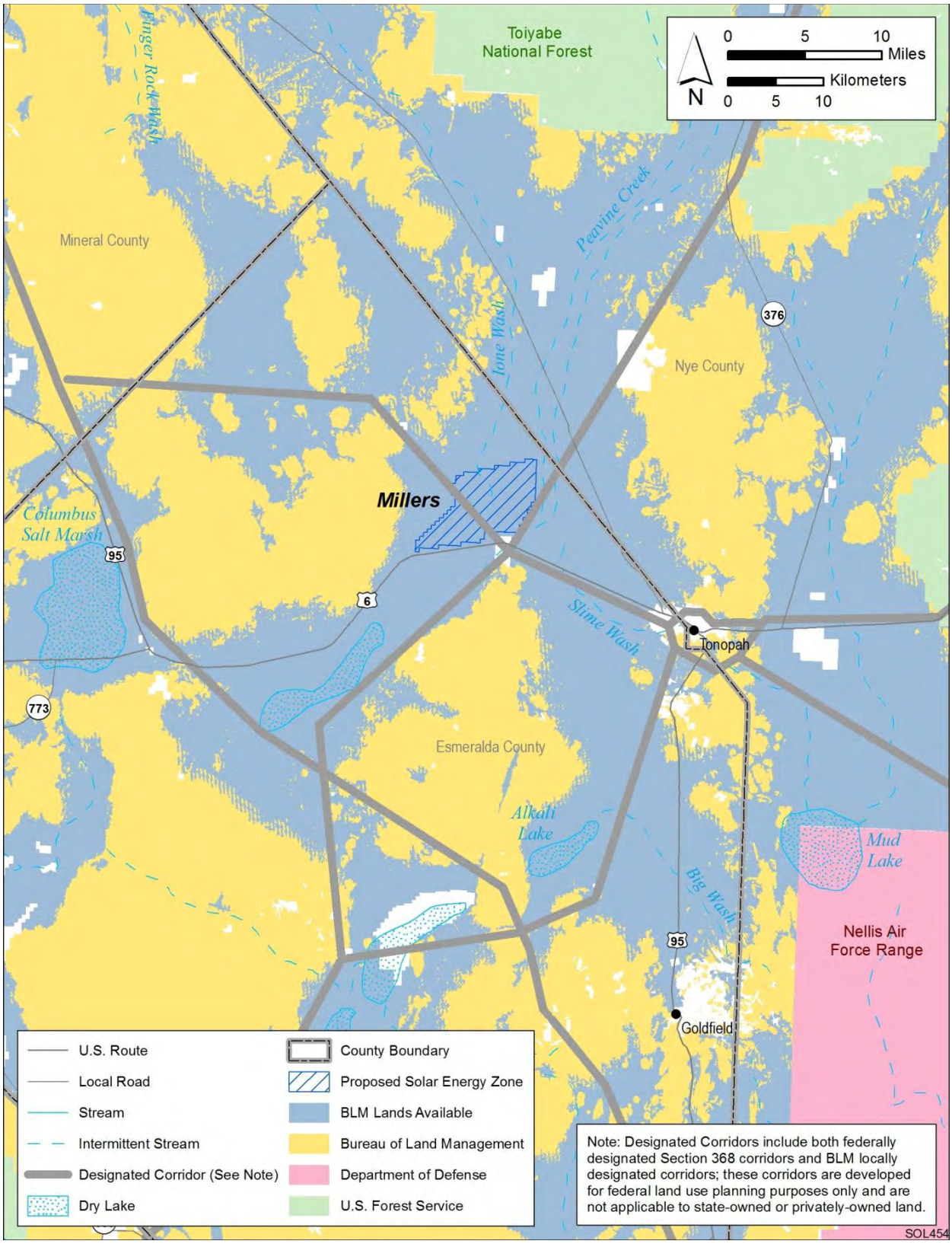

FIGURE C.4.5-1 Proposed Millers SEZ as Presented in the Draft Solar PEIS

- Clearing of a large portion of the proposed SEZ could adversely affect playa wetlands, other playa, Ione Wash scrub communities, dry washes, and greasewood flats habitats, depending on the amount of available habitat disturbed. The establishment of noxious weeds could result in habitat degradation. Deposition of fugitive dust could cause reduced productivity or changes in plant community structure.

- Candelaria blazingstar (*Mentzelia candelariae*), a plant species on the Nevada Natural Heritage Program (NNHP) watch list, may occur within the SEZ and may be directly affected by solar project development. Potentially suitable habitat for 19 special status species and more than 125 wildlife species occurs in the affected area of the proposed SEZ; no more than 1.6% of the potentially suitable habitat for any of these species occurs in the region that would be directly affected by development.

- If aquatic biota are present in intermittent or ephemeral streams in the SEZ, they could be affected by the direct removal of these surface water features within the construction footprint. If present, aquatic biota in surface water features could also be affected by a decline in habitat quantity and quality due to water withdrawals and changes in drainage patterns, as well as increased sediment and contaminant inputs associated with ground disturbance and construction activities.

- Temporary exceedances of ambient air quality standards for particulate matter at the SEZ boundaries are possible during construction. These high concentrations, however, would be limited to the immediate area surrounding the SEZ boundary.

- Although the SEZ is in an area of low scenic quality, strong visual contrasts could be observed by residents nearest to the SEZ. Weak to strong visual contrasts could be observed within the SEZ by travelers on U.S. 6.

- The potential for impacts on significant paleontological and cultural resources is unknown, but potentially high. It is possible that there will be Native American concerns over potential visual, acoustic, and other effects of solar energy development within the SEZ, including culturally important landscapes.

- Users of U.S. 95 could experience traffic congestion and slowdowns during construction at the SEZ.

C.4.5.2 Summary of Comments Received

Many environmental groups providing comments on the Draft Solar PEIS did not identify major conflicts for the Millers SEZ (The Wilderness Society et al.,[26] Center for Biological Diversity, Defenders of Wildlife, Sierra Club—Toiyabe Chapter, National Parks Conservation Association, and Natural Resources Defense Council). The Nevada Wilderness Project requested that nearby sand dunes and vegetation communities be avoided and suggested that the BLM may need to scale back the peak construction year and full build-out scenarios, given limited water availability. The Wilderness Society suggested that the BLM include analysis of potential impacts associated with sand dunes and vegetation communities in the Final Solar PEIS, as well as measures to avoid, minimize, or mitigate such impacts.

The U.S. Department of Defense (DoD) reiterated concerns over encroachment into military training route (MTR) airspace and structures higher than 50 ft (15 m) that were expressed during scoping for the Draft Solar PEIS. The Nevada Department of Wildlife recommended that the Final Solar PEIS include distribution, population size and health, and habitat analysis for kangaroo mice. Esmeralda County commented that the Draft Solar PEIS did not include input from the county, and it provided recommended alternate locations for renewable energy development.

C.4.5.3 Changes to the SEZ

No boundary revisions were identified for the proposed SEZ. However, areas specified for non-development under SEZ-specific design features were mapped, where data were available. For the proposed Millers SEZ, Ione Wash and a small wetland area in the southern portion of the SEZ, totaling 253 acres (1.0 km^2), were identified as non-development areas (Figure C.4.5-2). The remaining developable area within the SEZ is 16,534 acres (66.9 km^2).

C.4.5.4 Wilderness Character Status of SEZ

A recently maintained inventory of wilderness characteristics was used to determine whether public lands within the Millers SEZ have wilderness characteristics. The finding of this inventory was that these lands do not contain wilderness characteristics.

[26] The Wilderness Society, Center for Biological Diversity, Defenders of Wildlife, Sierra Club-Toiyabe Chapter, National Parks Conservation Association, Natural Resources Defense Council, Soda Mountain Wilderness Council, and Sierra Trek submitted joint comments on the proposed Nevada SEZs. Those comments are attributed to The Wilderness Society et al.

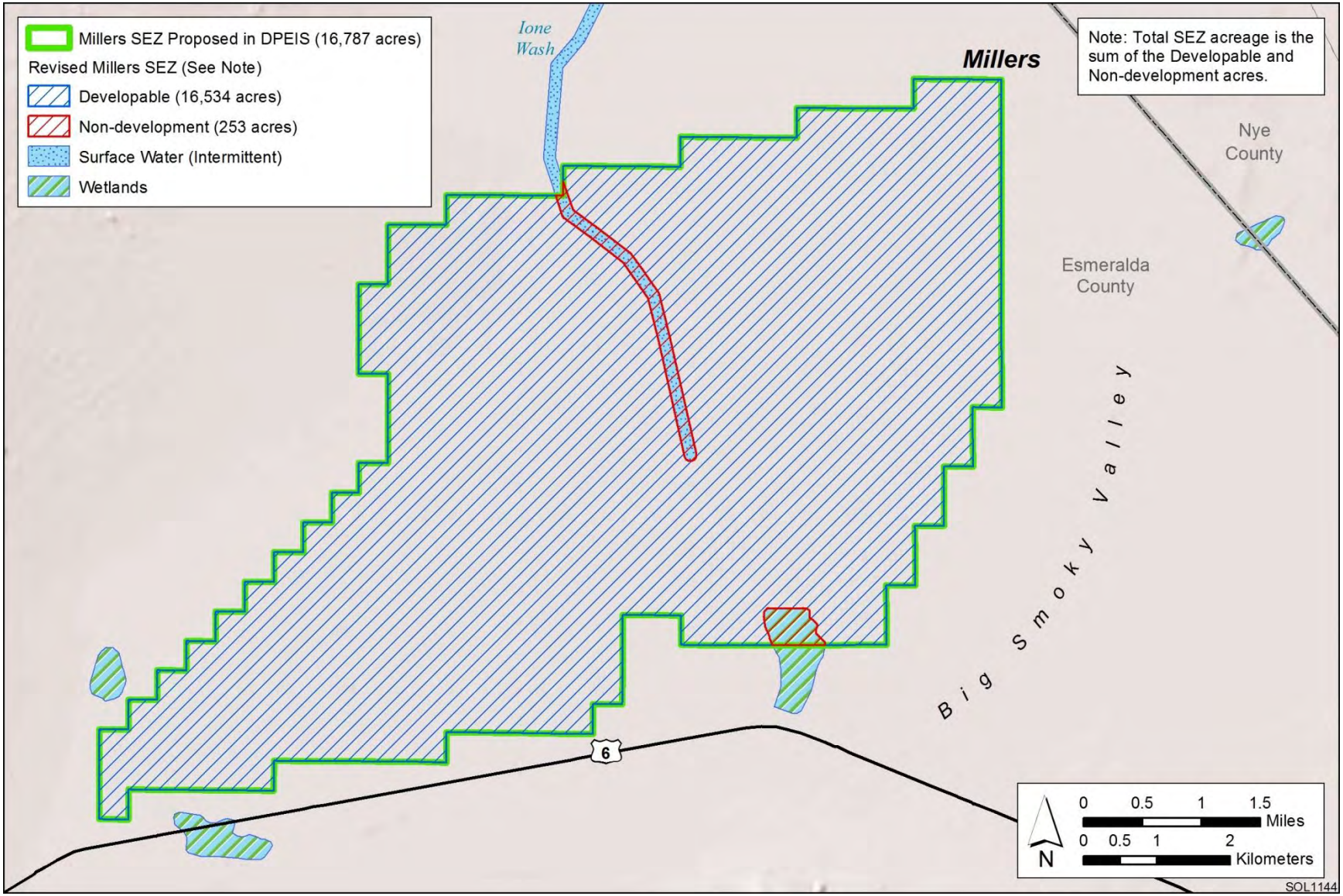

FIGURE C.4.5-2 Proposed Millers SEZ as Described in this Supplement

C.4.5.5 Additional Data Collection Recommended

C.4.5.5.1 Lands and Realty

None.

C.4.5.5.2 Specially Designated Areas and Lands with Wilderness Characteristics

None.

C.4.5.5.3 Rangeland Resources

***Livestock Grazing*.** None.

***Wild Horses and Burros*.** None.

C.4.5.5.4 Recreation

None.

C.4.5.5.5 Military and Civilian Aviation

The DoD has expressed continued concern regarding the potential impact of solar development in this SEZ on military operations The BLM will continue to consult with the DoD regarding potential issues with military operations.

C.4.5.5.6 Geologic Setting and Soil Resources

None.

C.4.5.5.7 Minerals

Additional information on leasable and strategic minerals in the vicinity of the SEZ will be provided in the Final Solar PEIS to inform the Department of the Interior's decision on a proposed 20-year withdrawal of SEZ lands.

C.4.5.5.8 Water Resources

The following additional data and actions would help further characterize potential impacts on water resources for the proposed Millers SEZ. A more detailed discussion of each of these activities is included in the water resources action plan provided in Section C.7.2 of this appendix.

- Prepare a planning-level water resources inventory of the Tonopah Flat portion of the Big Smoky Valley.

- Identify additional ephemeral stream channels and alluvial fan features for non-development areas through consultation with BLM Nevada, Nevada Division of Water Resources (NDWR), U.S. Environmental Protection Agency, and U.S. Army Corps of Engineers (USACE) with a focus on:
  - Tributaries to Ione Wash,
  - Alluvial fan base features located adjacent to Ione Wash, and
  - Ephemeral stream channels located along the eastern edge of the SEZ (e.g., tributaries of Peavine Creek, an intermittent stream just east of the SEZ).

- Perform field surveys and hydrologic analyses to support jurisdictional water determinations and floodplain identifications. Tasks include:
  - Surveying Ione Wash (and adjacent alluvial fan base), Peavine Creek, and tributaries of these streams for surface elevations, high water marks, sediment conditions; and
  - Conducting hydrologic rainfall-runoff-routing analyses to identify 100-year floodplain areas.

- Coordinate with the USACE (Sacramento District) regarding jurisdictional water determinations for the SEZ. Water features to be considered include:
  - Ione Wash, and
  - Peavine Creek (portion adjacent to the SEZ and tributaries within the SEZ).

- Identify 100-year floodplain non-development areas (if they exist) for Ione Wash and Peavine Creek (channel is outside of the SEZ, but its potential floodplain may be inside the SEZ). This task would require coordination with the Federal Emergency Management Agency and the following agencies:
  - NDWR (Floodplain Management Program), and
  - Esmeralda County.

- Describe the formation of a stakeholder committee to conduct long-term monitoring of water resources. This activity would entail:
  - Identifying key stakeholder agencies,
  - Discussing general features of a monitoring program, and
  - Working with the U.S. Geological Survey to develop groundwater monitoring well design and numerical groundwater models.

C.4.5.5.9 Ecological Resources

Vegetation and Plant Communities. The following additional data-gathering actions would help further characterize potential impacts on vegetation and plant communities for the proposed Millers SEZ:

- Identify and map the location and areal extent of desert dry wash, greasewood flat, wetland, and playa habitats, and Ione Wash shrub communities within the SEZ. Identify and map the location and areal extent of these habitats outside the SEZ that may be affected by hydrologic changes, including groundwater elevations, and changes in water, sediment, and contaminant inputs associated with runoff. Such efforts could help determine habitat characteristics, including water source, hydrologic regime, and dominant plant species.

- Survey for candelaria blazing star, a plant species on the NNHP watch list during a period when it is flowering and easily documented. If individuals are located, individuals or populations could be avoided through fencing and flagging of the area, including an appropriate buffer area.

Wildlife. The following additional data-gathering actions would help further characterize potential impacts on wildlife resources for the SEZ:

- Conduct pre-disturbance surveys within the SEZ to determine the use of the SEZ as a movement/migratory corridor or as important habitat for the mule deer.

- Identify and map the location and areal extent of wash and playa habitats within the SEZ. These areas are important habitat for a number of wildlife species.

Aquatic Biota. Investigations recommended under the water resources action plan (Section C.4.5.5.8) would be useful in characterizing the habitat available to aquatic biota. Most washes and dry lakes in the Millers SEZ are typically dry and contain water only for brief periods following precipitation. They may or may not contain aquatic biota; therefore, preliminary evaluations of these surface water features could be conducted to determine the potential for aquatic communities to be present. Any aquatic biota found in these features would likely be desiccation adapted aquatic invertebrates typical of the region. The primary value of these features may be to nonaquatic animals that consume aquatic biota within the SEZ.

Special Status Species. The following additional data-gathering actions would be useful in further characterizing and protecting habitat available to special status species:

- Conduct pre-disturbance surveys within the SEZ to determine the presence and abundance of those special status species that are (1) federally listed, proposed for listing, or candidates for listing under the Endangered Species Act (ESA); (2) protected by the State of Nevada; or (3) designated as sensitive by the Nevada BLM State Office. These species are listed in Table C.4.5-1. Surveys should focus on areas identified as potentially suitable, and the suitability of these habitats to support these special status species should be determined in the field. All field-determined suitable habitats for special status species should be mapped. Target species and survey protocols should be developed in coordination with the U.S. Fish and Wildlife Service and NDOW.

  The Draft Solar PEIS presents a table of special status species for which potential impacts need to be evaluated prior to development in the proposed Millers SEZ. The list of species presented in Table 11.7.12.1-1 of the Draft Solar PEIS also includes species listed by the State of Nevada and species ranked by the State of Nevada as S1 or S2 or species of concern. Based on the design features presented in the Draft Solar PEIS, the potential for impacts on these additional species will also need to be addressed before development could occur in the SEZ.

- Identify and map the location and areal extent of ephemeral wetland habitats, including desert wash and playa habitats within the SEZ, including habitat characteristics (such as water source, hydrologic regime, and dominant plant species), both within the wetland boundaries and in adjacent non-wetland habitats. A species potentially associated with these habitats includes the Eastwood milkweed.

C.4.5.5.10 Air Quality and Climate

None.

C.4.5.5.11 Visual Resources

As indicated in the Draft Solar PEIS, no federal, state, or BLM-designated sensitive visual resources areas (SVRAs) are located within a visible distance of 25 mi (40 km) from the proposed Millers SEZ. However, sensitive viewing locations (SVLs) are situated along the alignment of U.S. 6. Weak to strong visual contrasts from solar energy development within the SEZ would be expected for travelers along this roadway. A summary of the Draft Solar PEIS visual contrast analysis for the Millers SEZ is provided in Table C.4.5-2. The table includes only those resources that would be subject to moderate visual contrast.

TABLE C.4.5-1 Special Status Species That May Occur in the Vicinity of the Proposed Millers SEZ[a]

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Plants			
Eastwood milkweed	*Asclepias eastwoodiana*	BLM-S	Endemic to Nevada from public and private lands in Esmeralda, Lander, Lincoln, and Nye Counties in open areas on a wide variety of basic (pH usually >8) soils, including calcareous clay knolls, sand, carbonate or basaltic gravels, or shale outcrops, generally barren and lacking competition. Frequently in small washes or other moisture-accumulating microsites at elevations between 4,700 and 7,100 ft.[d] Nearest recorded occurrence is 12 mi[e] southeast of the SEZ. About 379,398 acres[f] of potentially suitable habitat occurs within the SEZ region.
Nevada dune beardtongue	*Penstemon arenarius*	BLM-S	Endemic to western Nevada on sand dunes or deep sand occurring on deep, loose, sandy soils of valley bottoms, aeolian deposits, and dune skirts, often in alkaline areas, sometimes on road banks and other recovering disturbances crossing such soils in shadscale communities. Nearest recorded occurrence is along Peavine Creek, approximately 17 mi northeast of the SEZ. About 97,638 acres of potentially suitable habitat occurs within the SEZ region.
Sanicle biscuitroot	*Cymopterus ripleyi* var. *saniculoides*	BLM-S	Endemic to Nevada on loose, sandy to gravelly, often somewhat alkaline soils on volcanic tuff deposits and mixed valley alluvium within blackbrush, mixed-shrub, sagebrush, and lower pinyon-juniper communities. Elevation ranges between 3,150 and 6,700 ft. Nearest recorded occurrence is 12 mi northeast of the SEZ. About 4,039,523 acres of potentially suitable habitat occurs within the SEZ region.
Toquima milkvetch	*Astragalus toquimanus*	BLM-S	Endemic to Nevada on dry, stiff, sandy to gravelly, basic or calcareous soils along gentle slopes or flats at elevations between 6,500 and 7,500 ft. Nearest recorded occurrence is 21 mi east of the SEZ. About 1,156,759 acres of potentially suitable habitat occurs within the SEZ region.
Invertebrates			
Crescent Dunes aegialian scarab beetle	*Aegialia crescenta*	ESA-UR; BLM-S	Sand dune obligate species endemic to Nevada on the Crescent Dunes and possibly also to the San Antonio and Game Range Dunes. Nearest recorded occurrence is from the Crescent Dunes Special Recreation Management Area (SRMA), about 6 mi east of the SEZ. About 2,281 acres of potentially suitable habitat occurs within the SEZ region.
Crescent Dunes serican scarab beetle	*Serica ammomenisco*	ESA-UR; BLM-S	Sand dune obligate species endemic to Nevada on the Crescent Dunes. Nearest recorded occurrence is from the Crescent Dunes SRMA, approximately 6 mi east of the SEZ. About 2,281 acres of potentially suitable habitat occurs within the SEZ region.

TABLE C.4.5-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Birds			
Ferruginous hawk	*Buteo regalis*	BLM-S; NV-P	Year-round resident in the SEZ region. Grasslands, sagebrush, and saltbrush habitats, as well as the periphery of pinyon-juniper woodland. Nests in tall trees or on rock outcrops along cliff faces. Known to occur in Esmeralda County, Nevada. About 1,403,676 acres of potentially suitable habitat occurs within the SEZ region.
Greater sage-grouse	*Centrocercus urophasianus*	ESA-C; BLM-S	Plains, foothills, and mountain valleys dominated by sagebrush. Lek sites are located in relatively open areas surrounded by sagebrush or in areas where sagebrush density is low. Nesting usually occurs on the ground where sagebrush density is higher. Some populations may travel up to 60 mi between summer and winter habitats. Known to occur in Esmeralda County, Nevada. About 1,264,279 acres of potentially suitable habitat occurs within the SEZ region.
Prairie falcon	*Falco mexicanus*	BLM-S	Year-round resident in open habitats in mountainous areas, steppe, grasslands, or cultivated areas. Nests in well-sheltered ledges of rocky cliffs and outcrops. Known to occur in Esmeralda County, Nevada. About 3,612,314 acres of potentially suitable habitat occurs within the SEZ region.
Swainson's hawk	*Buteo swainsoni*	BLM-S; NV-P	Summer breeding resident in the SEZ region. Savanna, open pine-oak woodlands, grasslands, and cultivated lands. Nests in solitary trees, bushes, or small groves. Known to occur in Esmeralda County, Nevada. About 847,596 acres of potentially suitable habitat occurs within the SEZ region.
Western burrowing owl	*Athene cunicularia hypugaea*	BLM-S	Open grasslands and prairies, as well as disturbed sites such as golf courses, cemeteries, and airports. Nests in burrows constructed by mammals (prairie dog, badger, etc.). Known to occur in Esmeralda County, Nevada. About 4,035,785 acres of potentially suitable habitat occurs within the SEZ region.
Mammals			
Fringed myotis	*Myotis thysanodes*	BLM-S; NV-P	Summer or year-round resident in wide range of habitats, including lowland riparian, desert shrub, pinyon-juniper, and sagebrush habitats. Roosts in buildings and caves. Known to occur in Esmeralda County, Nevada. About 4,549,929 acres of potentially suitable habitat occurs within the SEZ region.
Nelson's bighorn sheep	*Ovis canadensis nelsoni*	BLM-S	Open, steep rocky terrain in mountainous habitats of the eastern Mojave and Sonoran Deserts in California. Uses desert lowland as corridors for travel between mountain ranges. Known to occur in Esmeralda County, Nevada. About 1,866,606 acres of potentially suitable habitat occurs within the SEZ region.

TABLE C.4.5-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Mammals (Cont.)			
Spotted bat	*Euderma maculatum*	BLM-S; NV-P	Summer or year-round resident near forests and shrubland habitats. Roosts and hibernates in caves and rock crevices. Nearest recorded occurrence is 30 mi south of the SEZ. About 3,863,972 acres of potentially suitable habitat occurs within the SEZ region.
Townsend's big-eared bat	*Corynorhinus townsendii*	BLM-S; NV-P	Summer or year-round resident near forests and shrubland habitats below 9,000-ft elevation. Roosts and hibernates in caves, mines, and buildings. Nearest recorded occurrence is 7 mi south of the SEZ. About 3,580,069 acres of potentially suitable habitat occurs within the SEZ region.
Western small-footed bat[g]	*Myotis ciliolabrum*	BLM-S	Summer or year-round resident in woodlands and riparian habitats at elevations below 9,000 ft. Roosts in caves, buildings, mines, and crevices of cliff faces. Nearest recorded occurrence is 4 mi north of the SEZ. About 4,949,592 acres of potentially suitable habitat occurs within the SEZ region

[a] The listings for (1) federally listed, proposed for listing, or candidates for listing under the ESA, and (2) Arizona BLM State Office sensitive species have been updated since the release of the Draft Solar PEIS.

[b] BLM-S = listed as a sensitive species by the BLM; ESA-C = candidate for listing under the ESA; ESA-UR = under review for listing under the ESA; NV-P = protected in the state of Nevada under *Nevada Revised Statutes* (NRS) 501.110 (animals) or NRS 527 (plants).

[c] For plant species, potentially suitable habitat was determined by using Southwest Regional Gap Analysis Project (SWReGAP) land cover types (USGS 2005). For terrestrial vertebrate species, potentially suitable habitat was determined by using SWReGAP habitat suitability and land cover models. Area of potentially suitable habitat for each species is presented for the SEZ region, which is defined as the area within 50 mi (80 km) of the SEZ center.

[d] To convert ft to m, multiply by 0.3048.

[e] To convert mi to km, multiply by 1.609.

[f] To convert acres to km^2, multiply by 0.004047.

[g] Species in bold text have been recorded or have designated critical habitat within 5 mi (8 km) of the SEZ boundary.

TABLE C.4.5-2 Summary of Potential Visual Impacts on SVLs within the 25-mi (40 km) Viewshed of the Proposed Millers SEZ

Management Area Category	SVL within 25 mi[a] of SEZ	Total Acreage/ Mileage[a,c,d] of SVL	Distance from SEZ at Point of Closest Approach[e]	Total Acreage/ Mileage Visible within 25 mi	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes
Other Areas of Interest (non-management areas)	U.S. 6[b]	3,652 mi	Passes within 0.2 mi of the southern boundary of the SEZ	31 mi	0.8	Depending on project location within the SEZ, the types of solar facilities and their designs, and other visibility factors, weak to strong visual contrasts could be observed within the SEZ by travelers on U.S. 6. Also known as the Grand Army of the Republic Highway, U.S. 6 is the second longest highway in the United States.

[a] To convert mi to km, multiply by 1.609.

[b] Length of U.S. 6: DOT (2011b).

[c] To convert acres to km^2, multiply by 0.004047.

[d] Mileage (within all columns) is used only for trails or roads, unless otherwise specified.

[e] Distances are based on the Draft Solar PEIS analysis dated December 2010; any alterations to the SEZ boundaries may result in changes to the distance at the point of closest approach.

The following steps could be taken to better understand potential impacts on SVLs from solar development in the Millers SEZ:

- Key observation points (KOPs) within these areas should be identified through working with the management agency or other local stakeholders.

- Viewshed analyses from the KOPs should be conducted to determine how much of the SEZ would be in view from each KOP.

- As deemed necessary, based on viewshed analysis results, wireframe Google Earth™ visualizations of hypothetical solar facilities in the SEZ depicting the 80% development scenario could be prepared to better estimate potential impacts.

This additional analysis may be sufficient to judge potential visual contrast more accurately for most KOPs. For KOPs of particularly high sensitivity (e.g., U.S. 6), a site visit with photography and superimposition of the wireframe models onto the photos might be required or desired.

C.4.5.5.12 Acoustic Environment

None.

C.4.5.5.13 Paleontological Resources

The BLM Regional Paleontologist will be contacted to determine whether additional information is available regarding Potential Fossil Yield Classification (PFYC) identifications in Nevada. A preliminary paleontological survey could be conducted to determine the PFYC) of the SEZ, in order to update the temporary assignments of PFYC Class 3b (94%) and Class 2 (6%) used in the Draft Solar PEIS.

C.4.5.5.14 Cultural Resources and Native American Concerns

Approximately 4% of the proposed Millers SEZ has been surveyed (approximately 671 acres [2.7 km^2] out of 4 survey projects), and cultural resource impacts are likely. Thirty sites have been recorded in the SEZ, but none have been evaluated for eligibility for listing in the *National Register of Historic Places*. More than 100 sites have been recorded within 5 mi (8 km) of the SEZ, with at least 16 of these sites designated as potentially eligible (not all have been evaluated). Significant prehistoric resources, including Paleoindian sites, are likely to be located in dune areas and around margins of the Pleistocene lake, Lake Tonopah, within the Millers SEZ. Additional historic period sites are anticipated within the SEZ associated with the potentially eligible Millers town site adjacent to the SEZ.

The destruction or degradation of important plant resources, such as rice grass fields, sage brush in washes, wolfberries, and other medicinal, ceremonial, and food plants (per a comment from Duckwater Shoshone) and the destruction of habitat or impediments to the movement of culturally important wildlife, are also potential impacts of concern within the SEZ.

The following additional data collection efforts could reduce the uncertainty about potential impacts on cultural resources:

- Conduct a Class I literature file search to better understand (1) the site distribution pattern in the vicinity of the SEZ, (2) potential trail networks through existing ethnographic reports, and (3) overall cultural sensitivity of the landscape.

- Conduct a Class II Stratified Random Sample Survey of the SEZ to obtain a 10% sample (roughly 1,678 acres [6.8 km^2]).[27] If the roughly 671 acres (2.7 km^2) previously surveyed meets current survey standards, then approximately 1,007 acres (4.1 km^2) of survey could satisfy a 10% sample. Areas of interest, as determined through a Class I review, should also be identified prior to establishing the survey design and sampling strategy, such as dune areas and the shoreline of Lake Tonopah. Subsurface testing of dune areas should be a component of the sampling strategy as well.

- Prepare a cultural sensitivity map based on results of the Class II survey and Class I review.

- Continue with government-to-government consultation as described in Section 2.4.3, including follow-up to recent ethnographic studies with Tribes not included in the original studies to determine whether those Tribes have similar concerns. The Millers SEZ falls in the traditional use area of primarily the Western Shoshone and the Northern Paiute. Potential topics to be discussed during consultation include Big Smoky Valley, sites and landscapes around Lake Tonopah, ~~–e~~umulative effects to the places that gives songs to the Tribes" (per a comment from Duckwater Shoshone), and plant and animal resources, such as those listed above. The agencies value the information shared by the Tribes during the ethnographic study and will consider their input in striving to minimize the impacts of solar development in the SEZ. The completed ethnographic study will be available in its entirety on the Solar PEIS Web site (http://solareis.anl.gov). A summary of the contents of that report is also provided in the following text box.

[27] The BLM plans to conduct a Class II survey of 5% of this SEZ prior to the Final Solar PEIS. Additional areas could be surveyed as funding becomes available.

Tribal Perspectives on the Significance of Millers SEZ

The lands under consideration in the Millers SEZ study area related to the Draft Solar PEIS were traditionally occupied and used, aboriginally owned, and historically related to the Numic speaking peoples of the Great Basin. People specifically involved in the Draft Solar PEIS field consultations summarized here are from the Timbisha Shoshone Tribe and Duckwater Shoshone Tribe and are representing the cultural interests of the Western Shoshone people.

Numic-speaking peoples have and continue to stipulate that they are the American Indian peoples responsible for the cultural resources (natural and man-made) in this study area because their ancestors were placed here by the Creator and subsequently, they have lived in these lands, maintaining and protecting these places, plants, animals, water sources, and cultural signs of their occupation. Throughout traditional Numic territory, there are thousands of places connected through songs, oral history, human relations, ceremony, and trails (physical and spiritual). These connections create synergistic relationships between people and place.

These Numic-speaking peoples further stipulate that, because they have lived in these lands since the end of the Pleistocene and throughout the Holocene (or approximately 15,000 years), they deeply understand the dramatic shifts in climate and ecology that have occurred over these millennia. Indian lifeways were dramatically influenced by these natural shifts, but certain religious and ceremonial practices persisted unchanged. These traditional ecological understandings are carried from generation to generation through the recounting of origin stories occurring in mythic times and by strict cultural and natural resource conservation rules. The involved American Indian Tribal governments and their appointed cultural representatives have participated in this PEIS in order to explain the meaning and cultural centrality of the plants, animals, spiritual trails, healing places, and places of historic encounters that exist in these lands.

The Millers Solar SEZ region is located southwest of Big Smoky Valley, which has been culturally central to the lives of Western Shoshone people for thousands of years. They consider Big Smoky Valley to be a Landscape of Origin. Such an area is rare in traditional American Indian lands. Big Smoky Valley is thus especially important in the past, present, and future of American Indian culture.

The Millers SEZ study area extends well beyond the boundaries of the SEZ proper because of the existence of cultural resources in the surrounding landscape. The Millers SEZ study area includes plant and animal communities, geological features, water sources, storied lands, historic events and the trails that would have connected these features.

Lone Mountain to the south of the SEZ was also identified by Western Shoshone consultants as a vision questing location. The vision questing site would have been located on the triangular ridges half way up the mountain. It was noted that vision questing sites were not always at the top of the hill or mountain.

Geologically, the presence of the sand dunes and mountains makes the Millers SEZ region significant. Within Indian culture, powerful places are recognized by their topographic uniqueness. It is in these places that power, or Puha to Numic-speaking people, concentrates. These places of power are often in the form of hot springs, dramatic peaks, canyon constriction, and rivers and sand dunes (Stoffle et al. 2000). Crescent Dunes offers a unique topographic break in the otherwise flat expanse of the Big Smoky Valley. The panoramic views from the top of the dune as well as the acoustic nature (also known as singing sand dunes) of the Crescent Dunes make these dunes a unique place of Puha. The views and acoustics have their own powers that in turn contribute to the power of a place as well as facilitate the performance of ceremonies. (Stoffle et al. 2000). This geological feature has spiritual importance and is connected to the Millers SEZ study area though proximity and trails. The surrounding mountains, as previously discussed, also can power, water sources, mineral resources, and Mythic Time stories. Both mountains and sand dunes were destinations for ceremonial activities.

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Tribal Perspectives on the Significance of Millers SEZ (Cont.)

Ecologically, the Millers SEZ study area contains a wide variety of traditional medicinal, ceremonial, and edible plants. The eastern portion of the Millers SEZ region features massive fields of Indian ricegrass, or waii (*Achnatherum hymenoides*), a traditional food of great importance. The western portions of the SEZ region are dominated by Anderson wolfberry (*Lycium* sp.), which is a sweet berry used fresh or dried and often pounded into meat to preserve it.

During multiple field visits, Native American representatives identified 22 traditional use plants within the Millers SEZ study area. These included the medicinal plants rabbitbrush and indigo bush. Tribal representatives identified 35 animals in the Millers SEZ study area. They commented multiple times on the fact that there were Big Horn Sheep trails all though this area. Another animal that drew a large amount of interest from Tribal consultants was the Desert Horned Lizard, or Mon-tah-gay. In Western Shoshone culture, the Mon-tah-gay is associated with medicine and healing.

Historically, in the late 1800s to early 1900s, Western Shoshone people gathered at places in areas like Big Smoky Valley and held annual or seasonal festivals known as big times or fandangos. These events served both social and ceremonial purposes. In addition, Shoshone people discussed how places in Big Smoky Valley, such as the location known as Darrough's Hot Spring, were used for the Ghost Dance and associated activities. This area is located approximately 12 mi (19 km) northwest of Round Mountain in Smoky Valley.

C.4.5.5.15 Socioeconomics and Environmental Justice

None.

C.4.5.5.16 Cumulative Impact Considerations

None.

C.5 NEW MEXICO PROPOSED SOLAR ENERGY ZONES

C.5.1 Afton

C.5.1.1 Summary of Potential Impacts Identified in the Draft Solar Programmatic Environmental Impact Statement (PEIS)

The proposed Afton solar energy zone (SEZ), as presented in the Draft Solar PEIS, had a total area of 77,623 acres (314 km^2). It is located in Doña Ana County in southern New Mexico (Figure C.5.1-1). The towns of Las Cruces, Mesilla, Mesquite, University Park, and Vado are all within a 5-mi (8-km) radius of the SEZ. Las Cruces is the largest, with a population of approximately 90,000.

A designated Section 368 energy corridor occupies about 5,216 acres (21 km^2) of the southern portion of the SEZ and would limit development in the SEZ because solar facilities cannot be constructed under transmission lines or over pipelines.[28] This corridor is already heavily used and may need additional capacity in the future. The Draft Solar PEIS discussion of impacts of solar energy development in the SEZ acknowledged that solar facility development on both sides of the corridor would limit the ability to add future corridor capacity.

The Draft Solar PEIS identified a 345-kV transmission line that passes through the proposed SEZ as the nearest point for connection of the SEZ to the grid. The actual location of connection to the transmission grid could be different than that assumed in the Draft Solar PEIS. Details on the updated transmission impact assessment for SEZs to be included in the Final Solar PEIS are provided in Section C.7.1 of this appendix. Analysis of transmission lines and/or access roads will be completed, as necessary, as part of the project-specific environmental reviews (see Section 2.2.2.2.2 of this Supplement).

Potential adverse impacts identified in the Draft Solar PEIS included the following:

- Wilderness characteristics in the Aden Lava Flow, Organ Mountains, Organ Needles, Pena Blanca, Robledo Mountains, and West Potrillo Mountains/Mt. Riley Wilderness Study Areas (WSAs) would be adversely affected.

[28] Section 368 of the Energy Policy Act of 2005 (Public Law 109-58) required federal agencies to engage in transmission corridor planning (see Section 1.6.2.1 of the Draft Solar PEIS). As a result of this mandate, the U.S. Department of the Interior Bureau of Land Management (BLM), U.S. Department of Energy (DOE), U.S. Forest Service (USFS), and U.S. Department of Defense (DoD) prepared a PEIS to evaluate the designation of energy corridors on federal lands in 11 western states, including the 6 states evaluated in this study (DOE and DOI 2008). The BLM and USFS issued Records of Decision to amend their respective land use plans to designate numerous corridors, often referred to as Section 368 corridors.

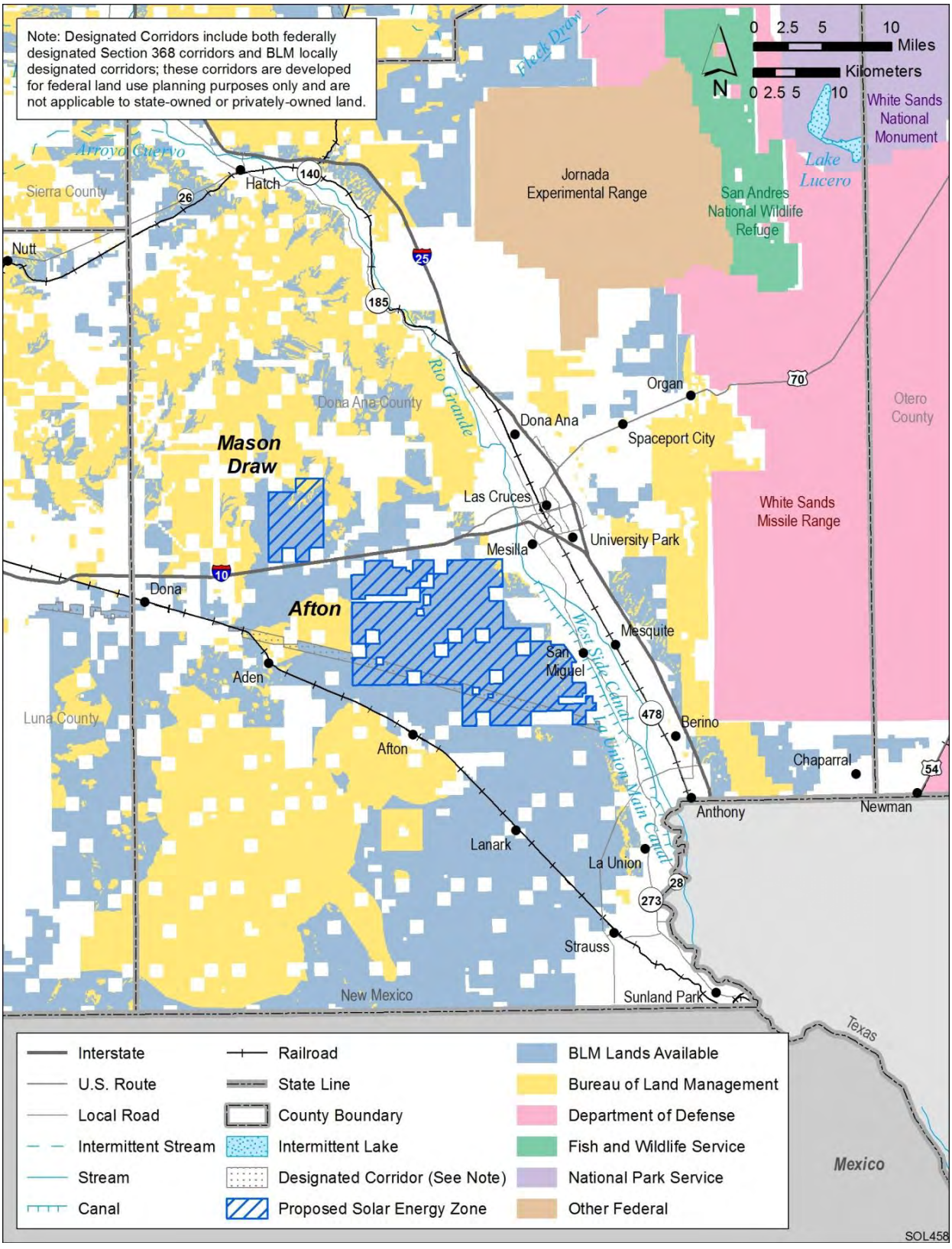

FIGURE C.5.1-1 Proposed Afton SEZ as Presented in the Draft Solar PEIS

- Scenic values and recreational use in the Organ/Franklin Special Recreation Management Area (SRMA)/Area of Environmental Concern (ACEC), Robledo Mountains ACEC, Prehistoric Trackways National Monument, Mesilla Plaza, El Camino Real National Scenic Byway, and El Camino Real de Tierra Adentro National Historic Trail would be adversely affected.

- Grazing permits for the Black Mesa, Home Ranch, and Little Black Mountains allotments would be cancelled and permittees would be displaced. Grazing permits for the Aden Hills, Corralitos Ranch, and La Mesa allotments would be reduced. A total of 5,481 animal unit months would be lost.

- Recreational resources and use in 6 WSAs within 25 mi (40 km) would be adversely affected.

- Because the SEZ is within 3 mi (5 km) of the Las Cruces Airport, Federal Aviation Administration regulations will have to provide necessary safety requirements.

- Impacts on soil resources (e.g., soil compaction, soil horizon mixing, soil erosion by wind and runoff, sedimentation, and soil contamination) could occur.

- Groundwater use would deplete the aquifer to the extent that neither wet-cooling nor dry-cooling options would be feasible (effectively limiting the available technologies to either dish engine or photovoltaic [PV]).

- Clearing of a large portion of the proposed SEZ could primarily affect stabilized coppice dune and sand flat scrub and may adversely affect desert dry wash, playa, wetland, riparian, and cliff sand dune habitats, depending on the amount of habitat disturbed. The establishment of noxious weeds could result in habitat degradation.

- Potentially suitable habitat for 35 special status species and more than 100 wildlife species occurs in the affected area of the proposed SEZ; 5.6% or less of the potentially suitable habitat for any of these species occurs in the region that would be directly affected by development.

- If aquatic biota are present in intermittent wetlands and ephemeral streams in the SEZ, they could be affected by the direct removal of these surface water features within the construction footprint. If present, aquatic biota could also be affected by a decline in habitat quantity and quality due to water withdrawals and changes in drainage patterns, as well as increased sediment and contaminant inputs associated with ground disturbance and construction activities.

- Temporary exceedances of ambient air quality standards for particulate matter at the SEZ boundaries are possible during construction. These high concentrations, however, would be limited to the immediate area surrounding the SEZ boundary.

- Although the SEZ is in an area of low scenic quality, strong visual contrasts could be observed by visitors to the Aden Lava Flow WSA, Robledo Mountains, Aden Hills SRMA, the El Camino Real de Tierra Adentro National Historic Trail, and the El Camino Real National Scenic Byway, and for some viewpoints on Interstates 10 and 25 (I-10 and I-25). Moderate to strong visual contrasts could be observed by visitors to Prehistoric Trackways National Monument, Organ Mountains WSA, Organ Needles WSA, Pena Blanca WSA, West Potrillo Mountains/Mt. Riley WSA, Doña Ana Mountains SRMA, Organ/Franklin Mountains SRMA, Doña Ana Mountains ACEC, Organ/Franklin Mountains ACEC, Robledo Mountains ACEC, Mesilla Plaza National Historic Landmark, and Kilbourne Hole National Natural Landmark, for some viewpoints on U.S. 70, and for the towns of Las Cruces, University Park, Mesilla, San Miguel, La Mesa, Mesquite, Vado, Berino, Doña Ana, and Anthony. Moderate visual contrast would be expected for some viewpoints on the Butterfield Trail.

- During construction, noise levels at the nearest residences would be higher than the U.S. Environmental Protection Agency (EPA) guidance levels. During operations, it was estimated that noise levels at the nearest residences would be equal to or above EPA guidance levels if concentrating solar power facilities with energy storage technologies (which could extend the daily operational time by 6 hours or more) or dish engine technology were used at the SEZ.

- The potential for impacts on significant paleontological resources is high, especially in the eastern portions of the SEZ along the edge of the mesa.

- Direct impacts on significant cultural resources could occur, especially in the dune areas and areas close to the Mesilla Valley. Views from the Florida and Potrillo Mountains may be of cultural importance to some Chiricahua groups.

- Minority populations occur within a 50-mi (80-km) radius of the proposed SEZ boundary; thus adverse impacts of solar development could disproportionately affect minority populations.

C.5.1.2 Summary of Comments Received

Most of the comments received on the proposed Afton SEZ were in favor of identifying the area as an SEZ, but with required mitigation measures to protect sensitive plants, National

Historic Trails, and cultural resources (The Wilderness Society et al.,[29] Mesilla Valley Audubon Society, Cultural Resource Preservation Coalition, and Audubon New Mexico). These groups generally supported designation of the SEZ because of its proximity to existing roads and transmission lines. The Nature Conservancy, however, recommended that boundaries of the SEZ be modified to remove the Kenzin Conservation Area and protect its grasslands.

The New Mexico Department of Agriculture had concerns that the impacts on ranching presented in the Draft Solar PEIS underestimated the true impacts on grazing allotments and suggested that mitigation of and/or compensation to affected ranching operations should be mandatory. The New Mexico Department of Game and Fish (NMDGF) supported designation of the area as an SEZ and agreed with the SEZ-specific design features in the Draft Solar PEIS, including specifying only PV technology and avoiding impacts on special habitat types.

The Partnership for the National Trails System recommended the removal of the Afton SEZ because of the potential impacts on El Camino Real de Tierra Adentro National Historic Trail, El Camino Real Scenic Byway, Butterfield Scenic Byway, and SRMAs. Full Circle Heritage Services believed that a more assertive effort should be made to consult with the Tribes. The Wilderness Society and others recommended stricter mitigation measures for water resources, including monitoring standards of water quality and groundwater levels.

C.5.1.3 Changes to the SEZ

The proposed Afton SEZ has been significantly reconfigured to eliminate 46,917 acres (190 km^2) of land. Lands that have been eliminated are at the north, northeast, southeast, and southwest boundaries (see Figure C.5.1-2). The rationale for the changes was to focus potential solar development in the area along the existing Section 368 corridor, where development already exists. In addition, 742 acres (3 km^2) of floodplain and intermittent and dry lake non-development areas within the remaining SEZ boundaries were identified. The remaining developable area within the SEZ is 29,964 acres (121.2 km^2).

To reduce the visual resource impacts of solar development within the proposed SEZ, SEZ-specific visual resource mitigation requirements have been developed. However, most of the areas of the SEZ that were labeled to meet Visual Resource Management (VRM) Class II- or VRM Class III-consistent objectives in the Draft Solar PEIS have been eliminated from the SEZ.

On the basis of the water impact analysis provided in the Draft Solar PEIS, development within the remaining areas of the SEZ may need to be restricted to photovoltaic technology or a technology with equivalent or lower water use. Updated analyses taking the revised SEZ boundaries into consideration will be included in the Final Solar PEIS.

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[29] The Wilderness Society, New Mexico Wilderness Alliance, Defenders of Wildlife, Audubon New Mexico, Gila Resources Information Project, Gila Conservation Coalition, Western Environmental Law Center, Southwest Environmental Law Center, Upper Gila Watershed Alliance, Sierra Club, Natural Resources Defense Council, Soda Mountain Wilderness Council, and Sierra Trek submitted joint comments on the proposed New Mexico SEZs. Those comments are attributed to The Wilderness Society et al.

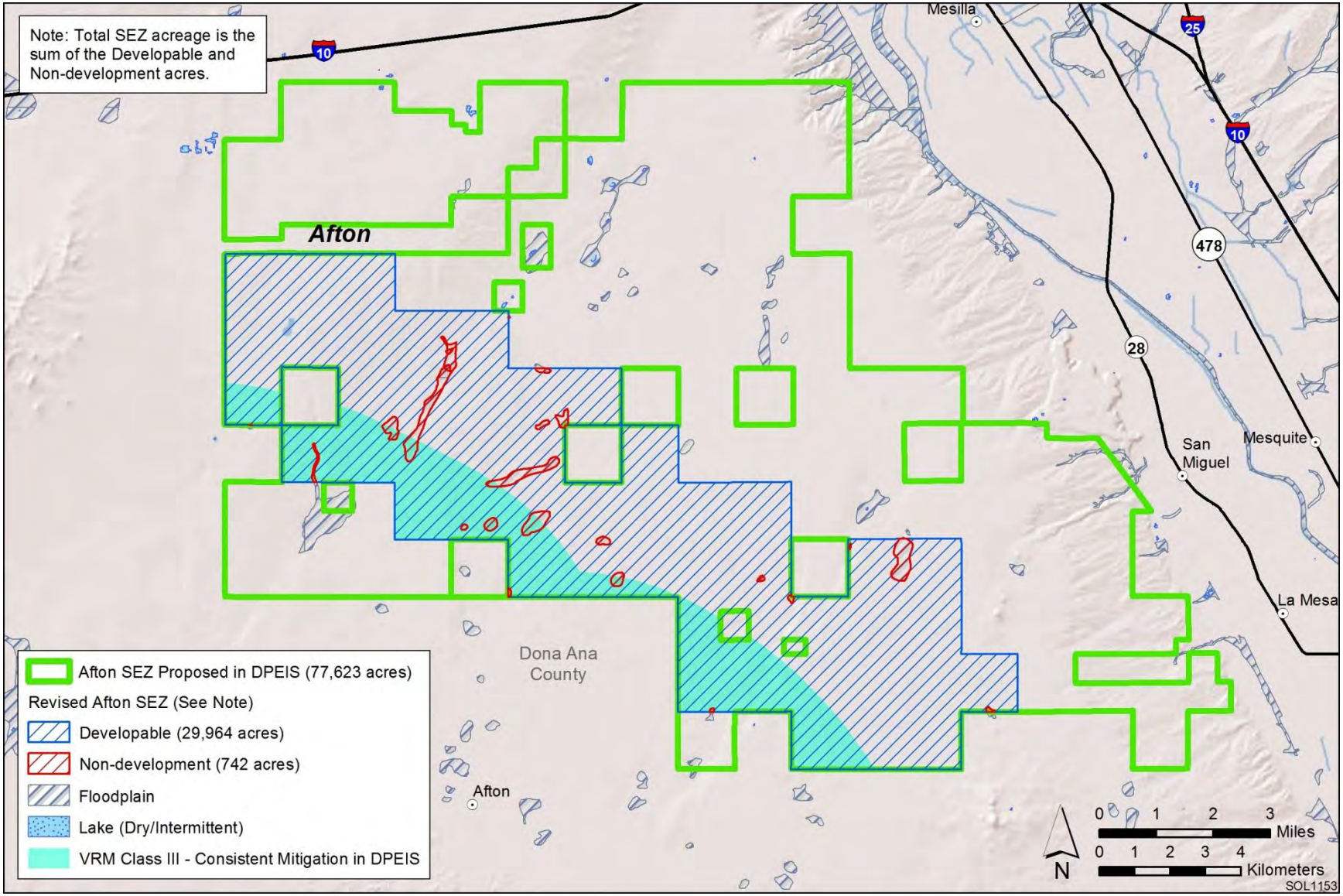

FIGURE C.5.1-2 Proposed Afton SEZ as Described in this Supplement

The lands eliminated from the proposed Afton SEZ will be retained as solar right-of-way variance lands, because the BLM expects that individual projects could be sited in this area to avoid and/or minimize impacts. Any solar development within this area in the future would require appropriate environmental analysis.

C.5.1.4 Wilderness Character Status of SEZ

A recently maintained inventory of wilderness characteristics was used to determine whether public lands within the Afton SEZ have wilderness characteristics. The finding of this inventory was that these lands do not contain wilderness characteristics.

C.5.1.5 Additional Data Collection Recommended

C.5.1.5.1 Lands and Realty

None.

C.5.1.5.2 Specially Designated Areas and Lands with Wilderness Characteristics

None.

C.5.1.5.3 Rangeland Resources

Livestock Grazing. The potential impact on grazing allotments will be re-evaluated based on the revised boundaries.

Wild Horses and Burros. None.

C.5.1.5.4 Recreation

None.

C.5.1.5.5 Military and Civilian Aviation

The potential for impact on the Las Cruces International Airport will be re-evaluated based on the revised boundaries of the proposed Afton SEZ.

C.5.1.5.6 Geologic Setting and Soil Resources

None.

C.5.1.5.7 Minerals

Additional information on leasable and strategic minerals in the vicinity of the proposed SEZ will be provided in the Final Solar PEIS to inform the Department of the Interior's decision on a proposed 20-year withdrawal of SEZ lands.

C.5.1.5.8 Water Resources

The following additional data and actions would help further characterize potential impacts on water resources for the proposed Afton SEZ. A more detailed discussion of each of these activities is included in the water resources action plan provided in Section C.7.2 of this appendix.

- Prepare a planning-level water resources inventory of the Mesilla Basin.

- Identify additional ephemeral stream channels and wetland features for non-development areas through consultation with the New Mexico Water Quality Control Commission (Watershed Protection Section), EPA, and U.S. Army Corps of Engineers (USACE) with a focus on:
  - Tributaries to the Rio Grande (eastern edge of SEZ), and
  - Ephemeral stream channels and wetlands located in the north and western portions of the SEZ (region approximately follows County Road B-006 from southwest to northeast).

- Perform field surveys and hydrologic analyses to support jurisdictional water determinations and floodplain identifications. Tasks include:
  - Surveying select stream channels and alluvial fan features for elevations, high water marks, sediment conditions, and
  - Conducting hydrologic rainfall-runoff-routing analyses to identify 100-year floodplain areas.

- Coordinate with the USACE (Albuquerque District) regarding jurisdictional water determinations for the SEZ. Water features to be considered include:
  - Tributaries to the Rio Grande (eastern edge of SEZ), and
  - Ephemeral stream channels and wetlands located in the north and western portions of the SEZ (region approximately follows County Road B-006 from southwest to northeast)

- Describe the formation of a stakeholder committee to conduct long-term monitoring of water resources. This activity would entail:

  - Identifying key stakeholder agencies,
  - Discussing general features of a monitoring program, and
  - Working with the U.S. Geological Survey (USGS) to develop groundwater monitoring well design and numerical groundwater models. (Groundwater monitoring should coordinate with the current USGS Mesilla Basin Monitoring Program [USGS 2011].)

- Develop a superposition groundwater model for the Mesilla Basin in order to estimate potential impacts of full build-out groundwater pumping scenarios (according to estimated, technology-specific water requirements). This activity would entail:
  - Assessing the potential for drawdown impacts on the Rio Grande, other groundwater uses, and surface water-groundwater connectivity, and
  - Using the USGS Mesilla Basin groundwater monitoring well program to support model development and calibration.

C.5.1.5.9 Ecological Resources

Vegetation and Plant Communities. The following additional data-gathering actions would help further characterize potential impacts on vegetation and plant communities for the proposed Afton SEZ:

- Identify and map the location and areal extent of desert dry wash, playa, wetland, and riparian habitats within the SEZ. Identify and map the location and areal extent of these habitats outside the SEZ that may be affected by hydrologic changes, including groundwater elevations and changes in water, sediment, and contaminant inputs associated with runoff. Such efforts could help determine habitat characteristics, including water source, hydrologic regime, and dominant plant species.

- Identify and map the location and areal extent of cliffs, sand dunes, and sand transport systems within the SEZ.

- Identify and map the location of all yucca, agave, and ocotillo cacti and other succulent plant species.

Wildlife. The following additional data-gathering actions would help further characterize potential impacts on wildlife resources for the SEZ:

- Conduct pre-disturbance surveys within the SEZ to determine the use of the SEZ as a movement/migratory corridor or as important habitat for mule deer.

- Identify and map the location and areal extent of dry lake and floodplain habitat within the SEZ. These areas are important habitat for a number of wildlife species.

Aquatic Biota. Investigations recommended under the water resources action plan (Section C.5.1.5.8) would be useful in characterizing and protecting habitat available to aquatic biota. Water may be temporarily present in the intermittent and ephemeral wetlands, pools, and streams located in the Afton SEZ. Therefore, seasonal aquatic invertebrate communities may be present. Wetlands, streams, and pools could be surveyed for aquatic biota.

Special Status Species. The following additional data-gathering actions would be useful in further characterizing and protecting habitat available to special status species:

- Conduct pre-disturbance surveys within the SEZ to determine the presence and abundance of those special status species that are (1) federally listed, proposed for listing, or candidates for listing under the Endangered Species Act (ESA); or (2) listed by the State of New Mexico as threatened or endangered; or (3) designated as sensitive by the New Mexico BLM State Office. These species are listed in Table C.5.1-1. Surveys should focus on areas identified as potentially suitable, and the suitability of these habitats to support these special status species should be determined in the field. All field-determined suitable habitats for special status species should be mapped. Target species and survey protocols should be developed in coordination with the U.S. Fish and Wildlife Service (USFWS) and NMDGF.

  The Draft Solar PEIS presents a table of Special Status Species for which potential impacts need to be evaluated prior to development in the proposed Afton SEZ. The list of species presented in Table 12.1.12.1-1 of the Draft Solar PEIS also includes species listed by the State of New Mexico and species ranked by the State of New Mexico as S1 or S2, or species of concern. On the basis of design features presented in the Draft Solar PEIS, the potential for impacts on these additional species will also need to be addressed before development could occur in the SEZ.

- Identify and map the location and areal extent of rocky slopes, cliffs, and outcrops within the SEZ. The suitability of these habitats for special status species should be determined. Species potentially associated with these habitats include the Marble Canyon rockcress, New Mexico rock daisy, Sneed's pincushion cactus, American peregrine falcon, fringed myotis, long-legged myotis, Townsend's big-eared bat, and western small-footed myotis.

- Identify and map the location and areal extent of desert grassland habitat within the SEZ. The suitability of this habitat for special status species should be determined. Species potentially associated with desert grassland habitat

TABLE C.5.1-1 Special Status Species That May Occur in the Vicinity of the Proposed Afton SEZ[a]

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Plants			
Arizona coralroot	*Hexalectris spicata* var. *arizonica*	BLM-S; NM-E	Oak and pinyon-juniper woodland communities in areas of heavy leaf litter. Known to occur in Doña Ana County, New Mexico. About 47,500 acres[d] of potentially suitable habitat occurs in the SEZ region.
Desert night-blooming cereus	*Peniocereus greggii* var. *greggii*	BLM-S; NM-E	Sandy to silty gravelly soils in desert grassland communities, gravelly flats, and washes. Nearest recorded occurrence is 6 mi[e] north of the SEZ. About 1,052,000 acres of potentially suitable habitat occurs in the SEZ region.
Grama grass cactus	*Sclerocactus papyracanthus*	BLM-S	Pinyon-juniper woodlands and desert grasslands on sandy soils at elevations between 4,900 and 7,200 ft.[f] Nearest recorded occurrence is 29 mi northeast of the SEZ. About 1,037,800 acres of potentially suitable habitat occurs in the SEZ region.
Marble Canyon rockcress	*Sibara grisea*	BLM-S	Rock crevices and the bases of limestone cliffs in chaparral and pinyon-juniper woodland communities at elevations between 4,500 and 6,000 ft. Known to occur in Doña Ana County, New Mexico. About 82,700 acres of potentially suitable habitat occurs in the SEZ region.
New Mexico rock daisy	*Perityle staurophylla* var. *staurophylla*	BLM-S	Endemic to south-central New Mexico in crevices of limestone cliffs and boulders at elevations between 4,900 and 7,000 ft. Known to occur in Doña Ana County, New Mexico. About 4,400 acres of potentially suitable habitat occurs in the SEZ region.
Sand prickly-pear cactus[g]	***Opuntia arenaria***	NM-E	Sandy areas, particularly semi-stabilized sand dunes among open Chihuahuan desertscrub, often associated with sparse cover of grasses at elevations between 3,800 and 4,300 ft. Known to occur on the SEZ and in other portions of the affected area. About 913,000 acres of potentially suitable habitat occurs in the SEZ region.
Sandhill goosefoot	*Chenopodium cycloides*	BLM-S	Open sandy areas, frequently along the edges of sand dunes. Known to occur in Doña Ana County, New Mexico. About 1,009,000 acres of potentially suitable habitat occurs in the SEZ region.
Sneed's pincushion cactus	*Escobaria sneedii* var. *sneedii*	ESA-E; NM-E	Limestone cracks of broken terrain on steep slopes and on limestone edges and rocky slopes in mountainous regions at elevations between 4,000 and 6,000 ft. Nearest recorded occurrences are approximately 10 mi southeast of the SEZ. About 4,500 acres of potentially suitable habitat occurs in the SEZ region.
Villard pincushion cactus	*Escobaria villardii*	BLM-S; NM-E	Franklin and Sacramento Mountains in Otero and Doña Ana Counties, New Mexico, on loamy soils of desert grassland on broad limestone benches at elevations between 4,500 and 6,500 ft. Known to occur in Doña Ana County, New Mexico. About 1,038,000 acres of potentially suitable habitat occurs in the SEZ region.

TABLE C.5.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Invertebrates			
Anthony blister beetle	*Lytta mirifica*	BLM-S	On flowering plants, often in agricultural areas where the species may be a pest of certain crops. Known to occur in Doña Ana County, New Mexico. About 138,500 acres of potentially suitable habitat occurs in the SEZ region.
Reptiles			
Texas horned lizard	***Phrynosoma cornutum***	BLM-S	Flat, open, generally dry habitats with little plant cover, except for bunchgrass, cactus, and desertscrub in areas of sandy or gravelly soil. Nearest quad-level occurrence intersects the affected area within 5 mi north of the SEZ. About 3,844,800 acres of potentially suitable habitat occurs in the SEZ region.
Birds			
American peregrine falcon	*Falco peregrinus anatum*	BLM-S; NM-T	Year-round resident in the SEZ region. Open habitats, including deserts, shrublands, and woodlands that are associated with high, near-vertical cliffs and bluffs above 200 ft. When not breeding, activity is concentrated in areas with ample prey, such as farmlands, marshes, lakes, rivers, and urban areas. Known to occur in Doña Ana County, New Mexico. About 1,997,000 acres of potentially suitable habitat occurs in the SEZ region.
Bald eagle	*Haliaeetus leucocephalus*	BLM-S; NM-T	Winter resident in the SEZ region. Large bodies of water or free-flowing rivers with abundant fish and waterfowl prey. Wintering areas are associated with open water. May occasionally forage in arid shrubland habitats. Known to occur in Doña Ana County, New Mexico. About 1,277,000 acres of potentially suitable habitat occurs in the SEZ region.
Bell's vireo	*Vireo bellii*	NM-T	Summer breeding resident in the SEZ region. Dense shrublands or woodlands along lower elevation riparian areas among willows, scrub oak, and mesquite. May potentially nest in any successional stage with dense understory vegetation. Known to occur in Doña Ana County, New Mexico. About 386,000 acres of potentially suitable habitat occurs in the SEZ region.
Ferruginous hawk	*Buteo regalis*	BLM-S	Winter resident in grasslands, sagebrush and saltbrush habitats, and the periphery of pinyon-juniper woodlands. Known to occur in Doña Ana County, New Mexico. About 131,300 acres of potentially suitable habitat occurs in the SEZ region.
Gray vireo	*Vireo vicinior*	NM-T	Summer breeding resident in the SEZ region. Semiarid, shrubby habitats, especially mesquite and brushy pinyon-juniper woodlands; also chaparral, desertscrub, thorn scrub, oak-juniper woodland, pinyon-juniper, mesquite, and dry chaparral. Nests in shrubs or trees. Known to occur in Doña Ana County, New Mexico. About 549,500 acres of potentially suitable habitat occurs in the SEZ region.
Northern aplomado falcon	*Falco femoralis septentrionalis*	ESA-E; NM-E	Year-round resident in the SEZ region. Open rangeland and savanna, semiarid grasslands with scattered trees, mesquite, and yucca. Nests in old stick nests of other raptors or ravens that are located in trees or shrubs in desert grassland. Nearest occurrences are 9 mi west of the SEZ. About 2,138,000 acres of potentially suitable habitat occurs in the SEZ region.

TABLE C.5.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Birds (Cont.)			
Western burrowing owl	*Athene cunicularia*	BLM-S	Year-round resident in the SEZ region. Open grasslands and prairies, as well as disturbed sites such as golf courses, cemeteries, and airports throughout the SEZ region. Nests in burrows constructed by mammals (prairie dog, badger, etc.). Known to occur in Doña Ana County, New Mexico. About 3,800,000 acres of potentially suitable habitat occurs in the SEZ region.
Western yellow-billed cuckoo	*Coccyzus americanus occidentalis*	ESA-C	May occur as a summer resident in the SEZ region. Riparian obligate, usually found in large tracts of cottonwood/willow habitats with dense sub-canopies. Known to occur in Doña Ana County, New Mexico. About 9,300 acres of potentially suitable habitat occurs in the SEZ region.
Mammals			
Desert bighorn sheep	*Ovis canadensis mexicana*	NM-T	Visually open, steep rocky terrain in mountainous habitats in desert regions. Rarely uses desert lowlands, but may use them as corridors for travel between mountain ranges. Known to occur in Doña Ana County, New Mexico. About 208,500 acres of potentially suitable habitat occurs in the SEZ region.
Fringed myotis	***Myotis thysanodes***	BLM-S	Wide range of habitats, including lowland riparian, desert shrub, pinyon-juniper, and sagebrush habitats. Roosts in buildings and caves. May be a summer or year-round resident in project area. Nearest quad-level occurrence intersects the affected area about 5 mi north of the SEZ. About 3,040,800 acres of potentially suitable habitat occurs in the SEZ region.
Long-legged myotis	*Myotis volans*	BLM-S	Primarily in montane coniferous forests; also riparian and desert habitats. Hibernates in caves and mines. Roosts in abandoned buildings, rock crevices, and under the bark of trees. Known to occur in Doña Ana County, New Mexico. About 2,705,000 acres of potentially suitable habitat occurs in the SEZ region.
Townsend's big-eared bat	***Corynorhinus townsendii***	BLM-S	Near forests and shrubland habitats below 9,000-ft elevation. Roosts and hibernates in caves, mines, and buildings. May be a summer or year-round resident in the project area. Nearest quad-level occurrence intersects the affected area about 5 mi north of the SEZ. About 2,627,600 acres of potentially suitable habitat occurs in the SEZ region.
Western small-footed myotis	*Myotis ciliolabrum*	BLM-S	Variety of woodlands and riparian habitats at elevations below 9,000 ft. Roosts in caves, buildings, mines, and crevices of cliff faces. May be a summer or year-round resident in the project area. Known to occur in Doña Ana County, New Mexico. About 3,805,400 acres of potentially suitable habitat occurs in the SEZ region.

[a] The listings for (1) federally listed, proposed for listing, or candidates for listing under the ESA, and (2) Arizona BLM State Office sensitive species have been updated since the release of the Draft Solar PEIS.

[b] BLM-S = listed as a sensitive species by the BLM; ESA-C = candidate for listing under the ESA; ESA-E = listed as endangered under the ESA; NM-E = listed as endangered by the State of New Mexico; NM-T = listed at threatened by the State of New Mexico.

Footnotes continued on next page.

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TABLE C.5.1-1 (Cont.)

[c] For plant species, potentially suitable habitat was determined by using Southwest Regional Gap Analysis Project (SWReGAP) land cover types (USGS 2005). For terrestrial vertebrate species, potentially suitable habitat was determined by using SWReGAP habitat suitability and land cover models. Area of potentially suitable habitat for each species is presented for the SEZ region, which is defined as the area within 50 mi (80 km) of the SEZ center.

[d] To convert acres to km^2, multiply by 0.004047.

[e] To convert mi to km, multiply by 1.609.

[f] To convert ft to m, multiply by 0.3048.

[g] Species in bold text have been recorded or have designated critical habitat in the affected area.

include the desert night-blooming cereus, grama grass cactus, Villard pincushion cactus, and northern aplomado falcon.

- Identify and map the location and areal extent of woodland habitat within the SEZ. The suitability of this habitat for special status species should be determined. Species potentially associated with woodland habitat include the Arizona coralroot grama-grass cactus, Marble Canyon rockcress, American peregrine falcon, Bell's vireo, ferruginous hawk, gray vireo, fringed myotis, and long-legged myotis.

- Identify and map the location and areal extent of riparian habitat within the SEZ. The suitability of this habitat for special status species should be determined. Species potentially associated with riparian habitat include the bald eagle, Bell's vireo, western yellow-billed cuckoo, and long-legged myotis.

- Identify and map the location and areal extent of sand dune habitat and associated sand transport systems within the SEZ. The suitability of this habitat for special status species should be determined. Species potentially associated with sand dune habitat include the sand prickly-pear cactus and sandhill goosefoot.

C.5.1.5.10 Air Quality and Climate

None.

C.5.1.5.11 Visual Resources

Visual resources will be revaluated for the Final Solar PEIS based on the revisions to boundaries and proposed technology restrictions described in Section C.5.1.3 of this Supplement. A summary of the Draft Solar PEIS visual contrast analysis for the proposed Afton SEZ is

provided in Table C.5.1-2. This table includes only the resources that would be subject to moderate or strong visual contrast. The Draft Solar PEIS visual impact analysis predicted these levels of visual contrast from solar energy development in the Afton SEZ for the following sensitive visual resource areas (SVRAs) and sensitive viewing locations (SVLs):

- Prehistoric Trackways
- Aden Lava Flow WS
- Organ Mountains, Organ Needles, Pena Blanca, Robledo Mountains, and West Potrillo Mountains/Mount Riley WSAs
- Aden Hills Off-Highway Vehicle SRMA
- Doña Ana Mountain SRMA
- Organ/Franklin Mountains Recreation Management Zone SRMA
- Doña Ana Mountain ACEC
- Organ/Franklin Mountain ACEC
- Robledo Mountain ACEC
- Mesilla Plaza, a National Historic Landmark
- El Camino Real de Tierra Adentro National Historic Trail
- El Camino Real Scenic Byway
- Kilbourne Hole National Natural Landmark
- Butterfield Trail
- I-25
- I-10
- U.S. 70
- The towns of Las Cruces, University Park, Mesilla, Doña Ana, San Miguel, La Mesa, Mesquite, Vado, and Berino.

TABLE C.5.1-2 Summary of Potential Visual Impacts on SVRAs and SVLs within the 25-mi (40-km) Viewshed of the Proposed Afton SEZ

Management Area Category	SVRA/SVL within 25 mi[a] of SEZ	Total Acreage/ Mileage[a,b,c] of SVRA/SVL	Distance from SEZ at Point of Closest Approach[d]	Total Acreage/Mileage Visible within 25 mi[e]	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes[f]
National Monument	Prehistoric Trackways	5,255 acres	6.2 mi north of the SEZ	3,007 acres	57.2	Most higher elevation viewpoints would have generally open views of solar developments; for these viewpoints, this would likely result in strong visual contrast levels from solar facilities. Lower elevation views may be partially screened by landforms, and partial visibility of the SEZ, combined with lower viewing angles, would result in lower levels of visual contrast at most viewpoints. The visible area of the monument extends to 9.6 mi from the point of closest approach at the northern boundary of the SEZ.
WSAs	Aden Lava Flow	25,978 acres	1.4 mi south of the SEZ	25,570 acres	98.4	Since the WSA is close to the proposed SEZ and is very flat, there is generally little screening by topography between the WSA and SEZ, and thus locations would have open views of the SEZ. Although the vertical angle of view is low, the SEZ is so large, it would stretch across much of the horizon, resulting in strong visual contrast for most locations. The visible area of the WSA extends from the point of closest approach to 8.9 mi from the southern boundary of the SEZ.

TABLE C.5.1-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi[a] of SEZ	Total Acreage/ Mileage[a,b,c] of SVRA/SVL	Distance from SEZ at Point of Closest Approach[d]	Total Acreage/Mileage Visible within 25 mi[e]	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes[f]
WSAs	Organ Mountains	7,186 acres	15 mi northeast of the SEZ	3,861 acres	53.7	Higher elevation viewpoints on the western side of the Organ Mountains would have elevated and open views of solar developments that would occupy most of the horizontal field of view, resulting in moderate to strong visual contrast levels. Lower elevation views may be partially screened by landforms, and partial visibility of the SEZ, combined with long distance and low viewing angles, would result in lower levels of visual contrast at most viewpoints. The visible area extends to about 18 mi from the point of closest approach at the northeast boundary of the SEZ.
	Organ Needles	5,936 acres	13 mi northeast of the SEZ	2,349 acres	39.6	Higher elevation viewpoints on the western side of the Organ Mountains would have elevated and open views of solar developments. Because of the SEZ's large size, it would occupy most of the horizontal field of view, resulting in moderate to strong visual contrast levels from solar facilities. Lower elevation views may be partially screened by landforms, and partial visibility of the SEZ, combined with long distance and low viewing angles, would result in lower levels of visual contrast at most, but not all, viewpoints. The visible area extends to about 17 mi from the northeastern boundary of the SEZ.

TABLE C.5.1-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi[a] of SEZ	Total Acreage/ Mileage[a,b,c] of SVRA/SVL	Distance from SEZ at Point of Closest Approach[d]	Total Acreage/Mileage Visible within 25 mi[e]	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes[f]
WSAs (*Cont.*)	Pena Blanca	4,648 acres	13 mi east of the SEZ	3,738 acres	80.4	Higher elevation viewpoints on the western side of the Organ Mountains would have elevated and open views of solar developments. Because of the SEZ's large size, it would occupy most of the horizontal field of view, resulting in moderate to strong visual contrast levels from solar facilities. Lower elevation views could be partially screened by landforms, but most viewpoints would have open views of the SEZ, and despite the low viewing angles, would likely be subject to moderate to strong visual contrasts from solar facilities. The visible area of the WSA extends about 15 mi from the northeastern boundary of the SEZ.
	Robledo Mountains	13,049 acres	8.3 mi north of the SEZ	2,622 acres	20.1	Viewpoints on the peaks and south-facing slopes would have elevated and open views of solar developments. Because of the SEZ's large size, it would occupy most of the horizontal field of view. Solar facilities would be likely to present strong visual contrast levels to viewers. Areas within the WSA also could have views of solar facilities within the Mason Draw SEZ, which could increase the perceived visual contrast associated with solar energy

TABLE C.5.1-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi[a] of SEZ	Total Acreage/ Mileage[a,b,c] of SVRA/SVL	Distance from SEZ at Point of Closest Approach[d]	Total Acreage/Mileage Visible within 25 mi[e]	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes[f]
WSAs (*Cont.*)	Robledo Mountains (*Cont.*)					development in the landscape setting. The visible area extends to about 14 mi from the northern boundary of the SEZ.
	West Potrillo Mountains/Mt. Riley	159,323 acres	5.7 mi southwest of the SEZ	52,951 acres	33.2	Higher elevation viewpoints in the northeastern portion of the WSA would have open views of solar developments. Because of the SEZ's large size, it would occupy most of the horizontal field of view; solar facilities would be likely to present moderate to strong visual contrast levels. Some areas could have views of solar facilities within the Mason Draw SEZ, which could increase the perceived visual contrast associated with solar energy development. The visible area of the WSA extends to about 23 mi from the western boundary of the SEZ.
SRMAs	Aden Hills Off-Highway Vehicle Area	8,054 acres	4.6 mi from the SEZ	7,681 acres	95.4	Solar facilities would be so visually prominent that they would be expected to dominate views from the SRMA to the east and would contrast very strongly with the surroundings, as seen from most of the SRMA. A portion of the SRMA within the viewshed extends to beyond 4.6 mi from the SEZ.

TABLE C.5.1-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi[a] of SEZ	Total Acreage/ Mileage[a,b,c] of SVRA/SVL	Distance from SEZ at Point of Closest Approach[d]	Total Acreage/Mileage Visible within 25 mi[e]	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes[f]
SRMAs (*Cont.*)	Doña Ana Mountain	8,345 acres	10 mi northeast of the SEZ	5,380 acres	64.5	For lower elevation viewpoints, the vertical angle of view is so low that it would be expected to reduce the visual contrast associated with solar facilities. Although the SRMA is close enough to the SEZ, the SEZ would stretch across most of the southern horizon, and moderate visual contrast would be expected. Because of the slightly higher vertical viewing angles, visual contrast levels would likely be greater for higher elevation viewpoints in the SRMA, even if they might be farther from the SEZ. The visible area extends from the point of closest approach to 16 mi within the SRMA.
	Organ/Franklin Mountains RMZ	60,793 acres	6.1 mi east of the SEZ	43,319 acres	71.3	Most of the area would have open views of solar developments; solar facilities would likely present strong visual contrast levels to viewers within the mountains. At some of the more distant viewpoints, moderate levels of visual contrast would be expected, primarily because the SEZ would occupy a smaller portion of the horizontal field of view. The visible area extends from the point of closest approach to 15 mi within the SRMA.

TABLE C.5.1-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi[a] of SEZ	Total Acreage/ Mileage[a,b,c] of SVRA/SVL	Distance from SEZ at Point of Closest Approach[d]	Total Acreage/Mileage Visible within 25 mi[e]	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes[f]
ACECs Designated for Outstanding Scenic Values	Doña Ana Mountain	1,427 acres	13 mi north of the SEZ	747 acres	52.3	For lower elevation viewpoints, the vertical angle of view is so low that it would be expected to reduce the visual contrast associated with solar facilities. Although the SRMA is close enough to the SEZ, the SEZ would stretch across most of the southern horizon, and moderate visual contrast would be expected. Because of the slightly higher vertical viewing angles, visual contrast levels would likely be greater for higher elevation viewpoints, even if they might be farther from the SEZ. The visible area of the ACEC extends approximately 15 mi from the northern boundary of the SEZ.
	Organ/Franklin Mountains	58,512 acres	6.1 mi east of the SEZ	41,101 acres	70.2	Most of the area would have open views of solar developments; solar facilities would likely present strong visual contrast levels to viewers. At some of the more distant viewpoints, moderate levels of visual contrast would be expected, primarily because the SEZ would occupy a smaller portion of the horizontal field of view. The visible area of the ACEC extends to more than 18 mi from the eastern boundary of the SEZ.

TABLE C.5.1-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi[a] of SEZ	Total Acreage/ Mileage[a,b,c] of SVRA/SVL	Distance from SEZ at Point of Closest Approach[d]	Total Acreage/Mileage Visible within 25 mi[e]	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes[f]
ACECs Designated for Outstanding Scenic Values (*Cont.*)	Robledo Mountains	8,659 acres	8.5 mi north of the SEZ	1,976 acres	22.8	Viewpoints on the peaks and south-facing slopes of the mountains would have elevated and open views of solar development. Because of the SEZ's large size, it would occupy most of the horizontal field of view; solar facilities would likely present strong visual contrast levels to viewers. Some areas also could have views of solar facilities within the Mason Draw SEZ, which could increase the perceived visual contrast. The visible area of the ACEC extends to about 14 mi from the northern boundary of the SEZ.
National Historic Landmark	Mesilla Plaza	NA[g]	Selected viewpoint is about 2.7 mi northeast of the northeast corner of the SEZ	NA	NA	Solar facilities would be expected to create moderate to strong visual contrasts, with stronger contrast levels expected if multiple power tower receivers were visible above West Mesa. The Plaza is located within the town of Mesilla.
National Historic Trail	El Camino Real de Tierra Adentro	404 mi	Passes within 3.2 mi east of the SEZ	41.9 mi	10.4	Because of the open views of the SEZ along the rim of West Mesa, and the elevated position of the SEZ with respect to the trail, strong visual contrasts would be expected for some viewpoints on the trail. The distance to the SEZ ranges from the point of closest approach to 20 mi north of the northern boundary of the SEZ.

TABLE C.5.1-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi[a] of SEZ	Total Acreage/ Mileage[a,b,c] of SVRA/SVL	Distance from SEZ at Point of Closest Approach[d]	Total Acreage/Mileage Visible within 25 mi[e]	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes[f]
National Natural Landmark	Kilbourne Hole[h]	1,088 acres	9.3 mi south-southwest of the SEZ	NA[g]	NA	Solar facilities would occupy most of the horizontal field of view looking north and northeast. Depending on solar facility location, the types of solar facilities and their designs, and other visibility factors, moderate to strong visual contrasts would be expected at locations along the top of the ridge around the north side of Kilbourne Hole. Contrast at locations along the ridge on the east, west, and south sides of the crater would generally be lower, due in part to increased distance to the SEZ but primarily because of partial or full screening of the SEZ. Views of the SEZ from inside the Kilbourne Hole crater would be completely screened by the crater walls. There is a ridge around nearly the entire crater, and the SEZ would be visible from the ridgeline and north-facing slopes of most of the ridge; a trail runs along the top of the ridge.
Scenic Byway	El Camino Real	299 mi	Passes within 3.2 mi east of the SEZ	52.4 mi	17.5	Because of the open views of the SEZ along the rim of West Mesa and the elevated position of the SEZ with respect to the byway, strong visual contrasts would be expected for some viewpoints. The distance between the byway and SEZ ranges from the point of closest approach to more than 24 mi south of the southeastern boundary of the SEZ.

TABLE C.5.1-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi[a] of SEZ	Total Acreage/ Mileage[a,b,c] of SVRA/SVL	Distance from SEZ at Point of Closest Approach[d]	Total Acreage/Mileage Visible within 25 mi[e]	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes[f]
Other Areas of Interest (non-management areas)	I-25[i]	1,063 mi	NA[g]	23 mi	2.2	Depending on the location, type, and height of solar facility components in the eastern part of the SEZ, visual contrast levels could be strong if multiple power towers were visible along the rim of West Mesa, with substantially lower levels of contrast expected if only lower height facilities were located along the eastern side of the SEZ. Solar facilities within the SEZ could be in view from I-25 for about 20 minutes driving time at highway speeds. Facilities could be in view from about 23 mi of the roadway, from beyond Radium Springs to I-25's southern terminus in Las Cruces. Southbound travelers would see very little at first, but as they approached Doña Ana, potential visibility of solar facilities in the SEZ would increase, reaching maximum levels of visual contrast at the I-25/I-10 interchange, where I-25 ends.
	I-10[j]	2,460 mi	NA[g]	81 mi	3.3	Northbound travelers could first see solar facilities outside of El Paso, with a gradual increase in contrast levels as I-10 passes north up the Mesilla Valley, and reaching maximum levels of visual contrast near the Las Cruces Municipal Airport. At some viewpoints,

TABLE C.5.1-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi[a] of SEZ	Total Acreage/ Mileage[a,b,c] of SVRA/SVL	Distance from SEZ at Point of Closest Approach[d]	Total Acreage/Mileage Visible within 25 mi[e]	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes[f]
Other Areas of Interest (non-management areas) (*Cont.*)	I-10[j] (*Cont.*)					depending on the location, type, and height of solar facility components, visual contrast levels could be strong. Solar facilities could be in view from I-10 for about 65 to 70 minutes driving time at highway speeds.
	U.S. 70[k]	2,385 mi	NA	22 mi	0.9	Contrast levels would continue to slowly increase, but would likely remain at moderate levels until U.S. 70 began to climb the western slope of West Mesa. At that point, the slope in front of the vehicle would cut off views of solar facilities. Solar facilities would come back into view as U.S. 70 crested the slope of West Mesa, very near to the junction of U.S. 70 and I-10. At this location, with open and near-level views of the SEZ less than 2 mi away, expected visual contrasts would be moderate to strong.
	Las Cruces[l]	83 acres	7 mi	NA	NA	Moderate to strong visual contrast levels could be experienced in some portions.
	University Park[l]	1,005 acres	7 mi	NA[g]	NA	Moderate to strong visual contrast levels could be experienced.
	Mesilla[l]	3,430 acres	7 mi	NA	NA	Strong visual contrast levels could be experienced.

TABLE C.5.1-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi[a] of SEZ	Total Acreage/ Mileage[a,b,c] of SVRA/SVL	Distance from SEZ at Point of Closest Approach[d]	Total Acreage/Mileage Visible within 25 mi[e]	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes[f]
Other Areas of Interest (non-management areas) (*Cont.*)	Doña Ana[l]	467 acres	9.2 mi	NA	NA	Weak to moderate visual contrast levels could be experienced.
	San Miguel	NA	0.8 mi	NA	NA	Strong visual contrast levels could be experienced.
	La Mesa	NA	1.2 mi	NA	NA	Strong visual contrast levels could be experienced.
	Mesquite[l]	531 acres	3.1 mi	NA[g]	NA	Strong visual contrast levels could be experienced.
	Vado[l]	1,894 acres	3.4 mi	NA[g]	NA	Strong visual contrast levels could be experienced.
	Berino	NA	6.0 mi	NA	NA	Moderate to strong visual contrast levels could be experienced.

[a] To convert mi to km, multiply by 1.609.

[b] To convert acres to km^2, multiply by 0.004047.

[c] Mileage (within all columns) is used only for trails or roads, unless otherwise specified.

[d] Distances at the point of closest approach are based on the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries would result in changes to these calculations.

[e] The total acreage/mileage visible within 25 mi (40 km) of the SEZ is based on the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries will result in changes to these acreages/mileages, as well as the percentage of total acreage/mileage visible within 25 mi (40 km) of the SEZ. The correct values will be given in the Final PEIS.

[f] The assessment of impacts is based on the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries may result in reduced impacts in some of the SVRAs/SVLs due to the reduction in the overall footprint of the SEZ.

Footnotes continued on next page.

TABLE C.5.1-2 (Cont.)

[g] NA = data not available.

[h] Approximate acreage of Kilbourne: BLM (2011b).

[i] Length of I-25: AARoads' Interstate Guide (2006a).

[j] Length of I-10: AARoads' Interstate Guide (2006b).

[k] Length of U.S. 70: US-Highways.com. (2010).

[l] Acreage of New Mexico towns/cities: U.S. Bureau of the Census (2011b).

The following steps could be taken to better understand potential impacts on these SVRAs and SVLs from solar development in the Afton SEZ:

- Identify key observation points (KOPs) within these areas through working with the management agency or other local stakeholders.

- Conduct viewshed analyses from the KOPs to determine how much of the SEZ would be in view from each KOP.

- As deemed necessary, based on viewshed analysis results, prepare wireframe Google Earth™ visualizations of hypothetical solar facilities in the SEZ depicting the 80% development scenario to better estimate potential impacts.

This additional analysis may help judge potential visual contrast more accurately for most KOP. For KOPs of particularly high sensitivity, a site visit with photography and superimposition of the wireframe models onto the photos might be required or desired.

Additional required mitigation measures to address potential visual resource impacts are given in Section C.7.3 of this appendix.

C.5.1.5.12 Acoustic Environment

None.

C.5.1.5.13 Paleontological Resources

The Afton SEZ is located in an area with a Potential Fossil Yield Classification (PFYC) that has been predominantly determined to be Class 4/5. Therefore, the potential for impacts on paleontological resources is high. A paleontological survey should be conducted to determine whether paleontological materials are present in the SEZ.

The BLM Regional Paleontologist will be contacted to determine whether additional information is available regarding PFYC identifications in New Mexico.

C.5.1.5.14 Cultural Resources and Native American Concerns

Approximately 6% of the revised proposed Afton SEZ footprint has been surveyed (approximately 1,840 acres [7.4 km^2]). At least 58 sites have been recorded within the SEZ. At least two of the sites are eligible for listing in the *National Register of Historic Places*, but many are undetermined. The densest concentration of sites is in the southwestern portion of the SEZ. Dune areas and areas near the Mesilla Valley are of potential concern for impacts on cultural resources, as are a number of nearby ACECs designated to protect cultural values. Approximately 330 sites have been recorded within 5 mi (8 km) of the SEZ, including several

sites with structural remains. The El Camino Real de Tierra Adentro National Historic Trail and the Butterfield Trail are both relatively close to the SEZ and could be affected visually. There may potentially be visual impacts on the Mesilla Plaza National Historic Landmark as well. The destruction or degradation of important plant resources, and the destruction of habitat or impediments to the movement of culturally important wildlife are also potential impacts of concern within the SEZ.

The following additional data collection efforts would reduce the uncertainty about potential impacts on cultural resources:

- Conduct a Class I literature file search to better understand (1) the site distribution pattern in the vicinity of the SEZ, (2) trail networks through existing ethnographic reports, and (3) overall cultural sensitivity of the landscape.

- Conduct a Class II Stratified Random Sample Survey of the SEZ to obtain a 10% sample (approximately 3,071 acres [12.4 km^2]). If the approximately 1,840 acres (7.4 km^2) previously surveyed meets current survey standards, then approximately 1,231 acres (5.0 km^2) of survey could satisfy a 10% sample. Areas of interest, as determined through a Class I review, should also be identified prior to establishing the survey design and sampling strategy, such as any dune areas in the SEZ. Subsurface testing of any dune areas should be a component of the sampling strategy.

- Prepare a cultural sensitivity map based on results of the Class II survey and Class I review.

- Identify any high potential segments of the El Camino Real de Tierra Adentro National Historic Trail and conduct viewshed analyses from key points along those portions of the trail.

- Conduct a viewshed analysis from Mesilla Plaza, a National Historic Landmark.

- Identify key points within nearby ACECs (Los Tules, Organ/Franklin Mountains, Robledo Mountain, Doña Ana Mountain, and San Diego Mountain) and Special Management Areas (Butterfield Trail) and conduct viewshed analyses to determine visual impacts on these resource areas designated for cultural values.

- Continue with government-to-government consultation as described in Section 2.4.3, including follow-up to recent ethnographic studies with Tribes not included in the original studies to determine whether those Tribes have similar concerns. The Afton SEZ falls in the traditional use area of primarily the Chiricahua Apache, but also the Manso and the Piro Pueblo. Descendants of the latter two groups are found among members of the Ysleta del Sur

Pueblo and in the Tortuga Community in Las Cruces. Potential topics to be discussed during consultation include Potrillo and Florida Mountains, Salinas Peak, the above-mentioned ACECs, trail systems, mountain springs, habitation sites as places of cultural importance, burial sites, rock art, ceremonial areas, water resources, and plant and animal resources.

C.5.1.5.15 Socioeconomics and Environmental Justice

None.

C.5.1.5.16 Cumulative Impact Considerations

None.

C.6 UTAH PROPOSED SOLAR ENERGY ZONES

C.6.1 Escalante Valley

C.6.1.1 Summary of Potential Impacts Identified in the Draft Solar Programmatic Environmental Impact Statement (PEIS)

The proposed Escalante Valley solar energy zone (SEZ), as presented in the Draft Solar PEIS, had a total area of 6,614 acres (27 km^2). It is located in Iron County in southwestern Utah (Figure C.6.1-1). The towns of Lund and Zane are about 4 mi (6 km) north of, and 5 mi (8 km) west of, the SEZ, respectively.

The Draft Solar PEIS identified a 138-kV transmission line that ends about 3 mi (5 km) from the southeastern area of the southernmost part of the SEZ as the nearest point of connection of the SEZ to the grid. The location of new transmission that could be constructed for this SEZ in the future may be different from that assumed in the Draft Solar PEIS. Details on the updated transmission impact assessment to be included in the Final Solar PEIS are provided in Section C.7.1 of this appendix. The Draft Solar PEIS also identified State Route 56, located about 15 mi (24 km) to the southeast of the SEZ, as the nearest major road, and assumed that a new access road would be constructed from the proposed SEZ to State Route 56 to support development. As for a new transmission line, the location of a new access road that could be constructed in the future may be different from that assumed in the Draft Solar PEIS. Analysis of transmission lines and/or access roads will be completed, as necessary, as part of the project-specific environmental reviews (see Section 2.2.2.2.2 of this Supplement).

Potential adverse impacts identified in the Draft Solar PEIS included the following:

- There could be a 20% reduction in the Butte grazing allotment that could have potential adverse economic impacts on two permittees.
- Impacts on soil resources (e.g., soil compaction, soil horizon mixing, soil erosion by wind and runoff, sedimentation, and soil contamination) could occur.
- Existing oil and gas leases represent a prior existing right that could affect solar energy development of the SEZ.
- Groundwater use would deplete the aquifer to the extent that, at a minimum, wet-cooling options would not be feasible.
- Clearing of a large portion of the proposed SEZ could adversely affect dry wash and dry lake habitats, and playa and sand dune and sand transport areas, depending on the amount of habitat disturbed. The establishment of noxious weeds could result in habitat degradation. Deposition of fugitive dust could cause reduced productivity or changes in plant community structure.

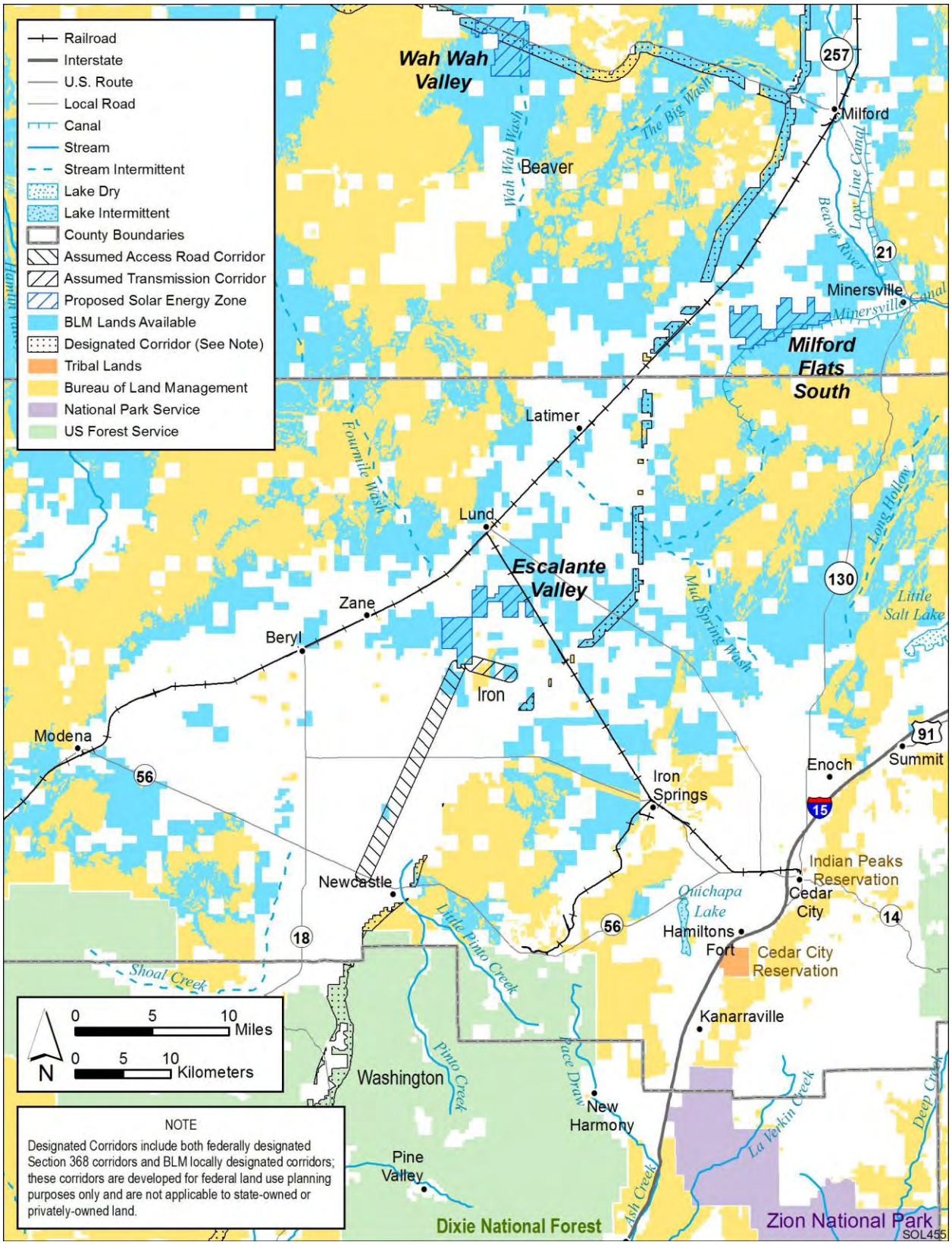

FIGURE C.6.1-1 Proposed Escalante Valley SEZ as Presented in the Draft Solar PEIS

- Potentially suitable habitat for 18 special status species and more than 70 wildlife species occurs in the affected area of the proposed SEZ; less than 1.1% of the potentially suitable habitat for any of these species occurs in the region that would be directly affected by development.

- If aquatic biota are present, they could be affected by the direct removal of surface water features within the construction footprint. If present, aquatic biota could also be affected by a decline in habitat quantity and quality due to water withdrawals and changes in drainage patterns, as well as increased sediment and contaminant inputs associated with ground disturbance and construction activities.

- Temporary exceedances of ambient air quality standards for particulate matter at the SEZ boundaries are possible during construction. These high concentrations, however, would be limited to the immediate area surrounding the SEZ boundary.

- Although the SEZ is in an area of low scenic quality, strong visual contrasts could be observed by residents nearest to the SEZ.

- During operations, noise levels at the nearest residences could be about equal to the Iron County regulation level if concentrating solar power facilities with energy storage technologies (which could extend the daily operational time by 6 hours or more) were used at the SEZ.

- Few, if any, impacts on significant paleontological resources are likely to occur. The proposed SEZ has a high potential for containing archaeological sites in the dune area in the southwest portion of the SEZ.

- Low-income populations occur within a 50-mi (80-km) radius of the proposed SEZ boundary; thus adverse impacts of solar development could disproportionately affect low-income populations.

C.6.1.2 Summary of Comments Received

Most of the comments received on the proposed Escalante Valley SEZ were in favor of identifying the area as an SEZ (HEAL Utah, The Wilderness Society et al.[30]). The Wilderness Society et al. proposed adjusting the boundary adjacent to the dry lakebed in the southwest portion of the SEZ with a buffer to protect the area and using existing access roads rather than constructing a new road from State Route 56.

[30] The Wilderness Society, Wild Utah Project, Southern Utah Wilderness Alliance, Grand Canyon Trust, Center for Native Ecosystems, Sierra Club, Natural Resources Defense Council, Soda Mountain Wilderness Council, and Sierra Trek submitted joint comments on the proposed Utah SEZs. Those comments are attributed to The Wilderness Society et al.

The Western Watersheds Project suggested that the U.S. Department of the Interior Bureau of Land Management (BLM) include the retirement of grazing allotments as a mitigation measure. There were concerns over vegetation removal and soil disturbance within the Escalante Valley SEZ, and stringent guidelines and mitigation measures to preserve native vegetation and soils were recommended to alleviate impacts (Wilderness Society et al.).

The Western Watersheds Project recommended that cumulative impact analysis include an analysis of the proposed new road construction, and new transmission lines and upgrades, particularly for species such as the greater sage-grouse, western burrowing owl, ferruginous hawk, pygmy rabbit, bald eagle, and Utah prairie dog. The Western Watersheds Project also recommended that the BLM perform cultural resource surveys and Native American consultation prior to defining the SEZ, to ensure that the SEZ is an area with low resource conflicts.

C.6.1.3 Changes to the SEZ

No boundary revisions were identified for the proposed SEZ. However, areas specified for non-development under SEZ-specific design features were mapped, where data were available. For the proposed Escalante Valley SEZ, 12 acres (0.05 km^2) of dry lake area and 69 acres (0.28 km^2) of dune area were identified as non-development areas (see Figure C.6.1-2). The remaining developable area within the SEZ is 6,533 acres (26.4 km^2).

C.6.1.4 Wilderness Character Status of SEZ

A recently maintained inventory of wilderness characteristics was used to determine whether public lands within the Escalante Valley SEZ have wilderness characteristics. The finding of this inventory was that these lands do not contain wilderness characteristics

C.6.1.5 Additional Data Collection Recommended

C.6.1.5.1 Lands and Realty

None.

C.6.1.5.2 Specially Designated Areas and Lands with Wilderness Characteristics

None.

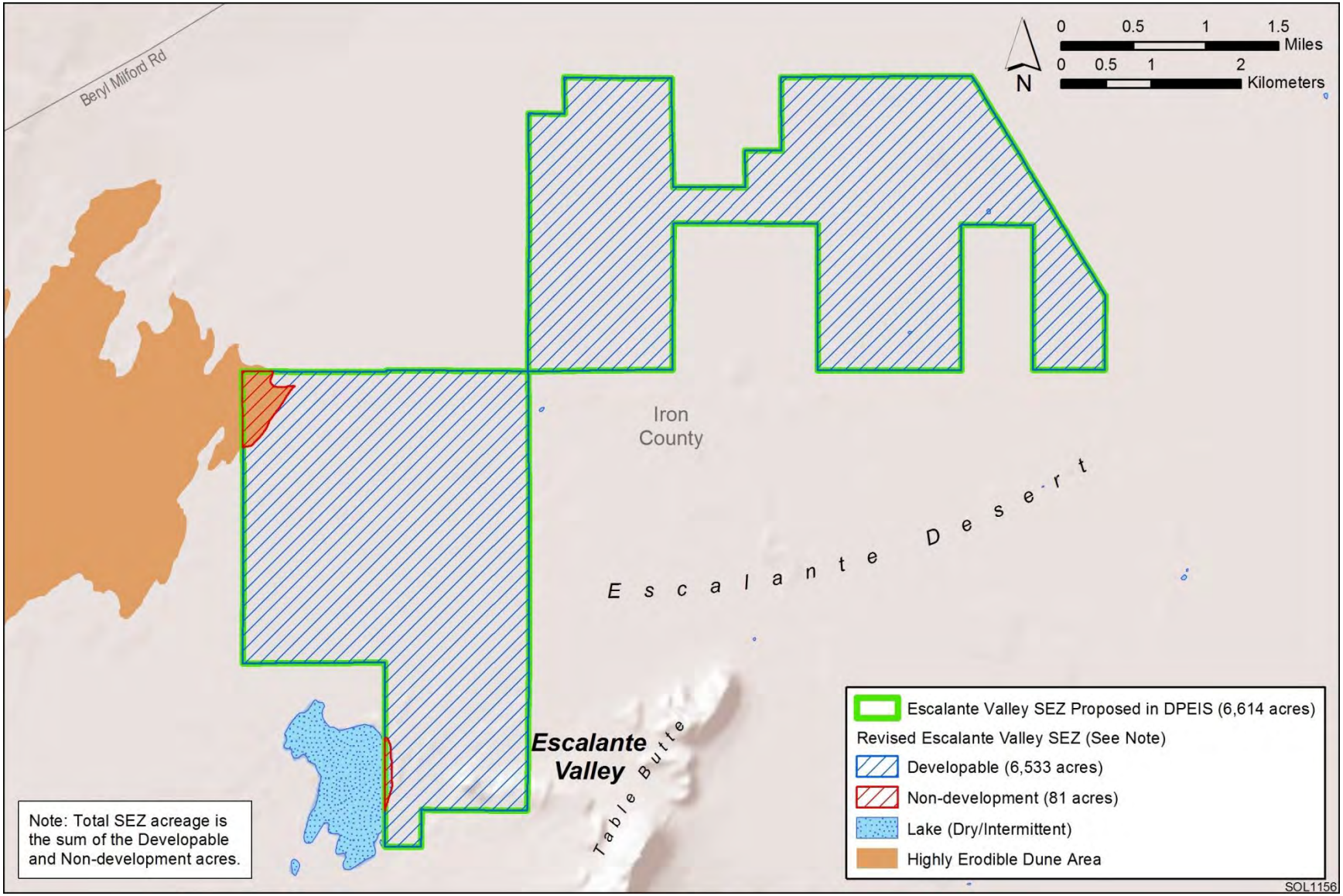

FIGURE C.6.1-2 Proposed Escalante Valley SEZ as Described in this Supplement

C.6.1.5.3 Rangeland Resources

***Livestock Grazing*.** The potential impact on the Butte grazing allotment needs to be reviewed with BLM field office staff.

***Wild Horses and Burros*.** None.

C.6.1.5.4 Recreation

None.

C.6.1.5.5 Military and Civilian Aviation

None.

C.6.1.5.6 Geologic Setting and Soil Resources

None.

C.6.1.5.7 Minerals

Additional information on leasable and strategic minerals in the vicinity of the proposed SEZ will be provided in the Final Solar PEIS to inform the Department of the Interior's decision on a proposed 20-year withdrawal of SEZ lands.

C.6.1.5.8 Water Resources

The following additional data and actions would help further characterize potential impacts on water resources for the proposed Escalante Valley SEZ. A more detailed discussion of each of these activities is included in the water resources action plan provided in Section C.7.2 of this appendix.

- Prepare a planning-level water resources inventory of the Beryl-Enterprise Basin.

- Identify additional dry lakes, ephemeral stream channels, and alluvial fan features for non-development areas through consultation with BLM Utah, Utah Division of Water Resources, Utah Division of Water Rights,

U.S. Environmental Protection Agency, and U.S. Army Corps of Engineers (USACE) with a focus on:
  - Dick Palmer Wash,
  - Unnamed washes in the southwestern portion of the SEZ, and
  - The dry lakebed to the west of Table Butte.

- Perform field surveys and hydrologic analyses to support jurisdictional water determinations and floodplain identifications. Tasks include:
  - Surveying Dick Palmer Wash and unnamed washes for surface elevations, high water marks, and sediment conditions; and
  - Conducting hydrologic rainfall-runoff-routing analyses to identify 100-year floodplain areas.

- Coordinate with the USACE (Sacramento District) regarding jurisdictional water determinations for the SEZ. Water features that need to be considered include:
  - Dick Palmer Wash, and
  - The unnamed washes.

- Identify 100-year floodplain non-development areas (if they exist) for the dry lake, Dick Palmer Wash, and unnamed washes identified during field survey. This task would require coordination with the Federal Emergency Management Agency and the following agencies:
  - Utah Department of Public Safety, and
  - Utah Geological Survey.

- Describe the formation of a stakeholder committee to conduct long-term monitoring of water resources. This activity would entail:
  - Identifying key stakeholder agencies,
  - Discussing general features of a monitoring program, and
  - Working with the U.S. Geological Survey to develop groundwater monitoring well design and numerical groundwater models.

- Develop a simple, numerical groundwater model for the Beryl-Enterprise Basin to evaluate the potential impacts of full build-out. This activity would entail:
  - Assessing the potential for drawdown impacts on the basin, which is already in overdraft, including the potential for land subsidence.

C.6.1.5.9 Ecological Resources

Vegetation and Plant Communities. The following additional data-gathering actions would help further characterize potential impacts on vegetation and plant communities for the proposed Escalante Valley SEZ:

- Identify and map the location and areal extent of desert riparian, desert dry wash, greasewood flat, dry lake, and playa habitats within the SEZ. Identify and map the location and areal extent of these habitats outside the SEZ that may be affected by hydrologic changes, including groundwater elevations, and changes in water, sediment, and contaminant inputs associated with runoff. Such efforts could determine habitat characteristics, including water source, hydrologic regime, and dominant plant species.

- Identify and map the location and areal extent of sand dunes and sand transport systems within the SEZ.

Wildlife. The following additional data-gathering actions would help further characterize potential impacts on wildlife resources for the SEZ:

- Conduct pre-disturbance surveys within the SEZ to determine the use of the SEZ as a movement/migratory corridor or as important habitat for mule deer and pronghorn.

- Identify and map the location and areal extent of wash, playa, and sand dune and sand transport habitat within the SEZ. These areas are important habitat for a number of wildlife species.

Aquatic Biota. Investigations recommended under the water resources action plan (Section C.6.1.5.8) would be useful in characterizing and protecting habitat available to aquatic biota. Washes and dry lakes in the Escalante Valley SEZ are typically dry and are likely to contain water only for brief periods following precipitation. They may or may not contain aquatic biota; therefore, preliminary evaluations of these surface water features could be conducted to determine the potential for aquatic communities to be present. Any aquatic biota found in these features would likely be desiccation adapted aquatic invertebrates typical of the region. The primary value of these features may be to nonaquatic animals that consume aquatic biota within the SEZ.

Special Status Species. The following additional data-gathering actions would be useful in further characterizing and protecting habitat available to special status species:

- Conduct pre-disturbance surveys within the SEZ to determine the presence and abundance of those special status species that are (1) federally listed, proposed for listing, or candidates for listing under the Endangered Species Act (ESA); or (2) designated as sensitive by the Utah BLM State Office. These species are listed in Table C.6.1-1. Surveys should focus on areas identified as potentially suitable, and the suitability of these habitats to support these special status species should be determined in the field. All field-determined suitable habitats for special status species should be mapped.

TABLE C.6.1-1 Special Status Species That May Occur in the Vicinity of the Proposed Escalante Valley SEZ[a]

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Plants			
Compact cat's-eye	*Cryptantha compacta*	BLM-S	Salt desert shrub and mixed shrub communities at elevations between 5,000 and 8,400 ft.[d] Known from southwestern Millard County and northwestern Beaver County, Utah, and eastern Nevada. Nearest recorded occurrence is 50 mi[e] northwest of the SEZ. About 2,161,906 acres[f] of potentially suitable habitat occurs within the SEZ region.
Jone's globemallow	*Sphaeralcea caespitosa*	BLM-S	Known from at least four occurrences in western Utah and six occurrences in eastern Nevada on federal and state lands on dolomite calcareous soils in association with mixed shrub, pinyon-juniper, and grassland communities at elevations between 5,000 and 6,500 ft. Nearest recorded occurrence is 38 mi north of the SEZ. About 4,150,988 acres of potentially suitable habitat occurs within the SEZ region.
Long-calyx milkvetch	*Astragalus oophorus lonchocalyx*	BLM-S	Endemic to the Great Basin in western Utah and eastern Nevada in pinyon-juniper woodlands, sagebrush, and mixed shrub communities at elevations between 5,800 and 7,500 ft. Nearest recorded occurrences are 30 mi west of the SEZ. About 4,065,963 acres of potentially suitable habitat occurs within the SEZ region.
Money wild buckwheat	*Eriogonum nummulare*	BLM-S	Western Utah and eastern Nevada on gravelly washes, flats, and slopes in saltbush and sagebrush communities and pinyon-juniper woodlands. Nearest recorded occurrence is 30 mi west of the SEZ. About 3,659,646 acres of potentially suitable habitat occurs within the SEZ region.
Nevada willowherb	*Epilobium nevadense*	BLM-S	Known from western Utah in Iron, Millard, and Washington Counties, as well as Lincoln County, Nevada, in pinyon-juniper woodlands and oak/mountain mahogany communities, on talus slopes and rocky limestone outcrops. Elevation ranges between 5,000 and 8,800 ft. Nearest recorded occurrence is in the Dixie National Forest, approximately 30 mi southwest of the SEZ. About 2,058,301 acres of potentially suitable habitat occurs within the SEZ region.
Birds			
Bald eagle	*Haliaeetus leucocephalus*	BLM-S	Known as a winter resident throughout the SEZ region, most commonly along large bodies of water where fish and waterfowl prey are available. Wintering areas are associated with open water. May occasionally forage in arid shrubland habitats. Nearest recorded occurrences are from Fourmile and Mud Spring Washes 10 mi north and northeast of the SEZ. About 2,830,633 acres of potentially suitable habitat occurs within the SEZ region.
Ferruginous hawk[g]	***Buteo regalis***	BLM-S	Known as a winter resident throughout the SEZ region. Grasslands, shrublands, agricultural lands, and the periphery of pinyon-juniper forests throughout the SEZ region. Quad-level occurrences intersect the affected area**.** About 1,712,600 acres of potentially suitable habitat occurs within the SEZ region.

TABLE C.6.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Birds (Cont.)			
Greater sage-grouse	***Centrocercus urophasianus***	ESA-C	A year-round resident in the SEZ region. Plains, foothills, and mountain valleys dominated by sagebrush throughout the SEZ region. Lek sites are located in relatively open areas surrounded by sagebrush or in areas where sagebrush density is low. Nesting usually occurs on the ground where sagebrush density is higher. Quad-level occurrences intersect the affected area east of the SEZ. Crucial brooding habitat for the species exists within 10 mi east of the SEZ. About 1,591,858 acres of potentially suitable habitat occurs within the SEZ region.
Long-billed curlew	*Numenius americanus*	BLM-S	Summer resident and migrant throughout the SEZ region in short-grass grasslands near standing water. Species is likely to be transient only in the vicinity of the SEZ. Nearest recorded occurrences are from the Beaver River, approximately 30 mi northeast of the SEZ. About 237,630 acres of potentially suitable habitat occurs within the SEZ region.
Northern goshawk	*Accipiter gentilis*	BLM-S	A year-round resident in the SEZ region. Mature mountain forest and riparian zone habitats throughout the SEZ region. Nests in trees in mature deciduous, coniferous, and mixed forests. Forages in both heavily forested and relatively open shrubland habitats. Nearest recorded occurrences are approximately 25 mi southeast of the SEZ. About 591,239 acres of potentially suitable habitat occurs within the SEZ region.
Short-eared owl	*Asio flammeus*	BLM-S	A winter resident in the SEZ region. Grasslands, shrublands, and other open habitats throughout the SEZ region. Nearest recorded occurrences are within 10 mi northwest of the SEZ. About 3,990,928 acres of potentially suitable habitat occurs within the SEZ region.
Western burrowing owl	*Athene cunicularia hypugaea*	BLM-S	A year-round resident in the SEZ region. Open grasslands and prairies, as well as disturbed sites such as golf courses, cemeteries, and airports throughout the SEZ region. Nests in burrows constructed by mammals (prairie dog, badger, etc.). Nearest recorded occurrences are about 5 mi from the SEZ. About 2,108,869 acres of potentially suitable habitat occurs within the SEZ region.
Mammals			
Fringed myotis	*Myotis thysanodes*	BLM-S	Wide range of habitats, including lowland riparian, desert shrub, pinyon-juniper, and sagebrush habitats. Roost sites have been reported in buildings and caves. Nearest recorded occurrences are 30 mi south of the SEZ. About 4,742,697 acres of potentially suitable habitat occurs within the SEZ region.
Kit fox	*Vulpes macrotis*	BLM-S	Open prairie, plains, and desert habitats where it inhabits burrows and preys on rodents, rabbits, hares, and small birds. Nearest recorded occurrences are approximately 35 mi northwest of the SEZ. About 1,889,326 acres of potentially suitable habitat occurs within the SEZ region.

TABLE C.6.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Mammals (Cont.)			
Pygmy rabbit	*Brachylagus idahoensis*	BLM-S	Sagebrush-shrubland habitats throughout the SEZ region. Prefers loose soils to dig burrows. Nearest recorded occurrences are about 5 mi from the SEZ. About 1,016,858 acres of potentially suitable habitat occurs within the SEZ region.
Spotted bat	*Euderma maculatum*	BLM-S	Near forests and shrubland habitats throughout the SEZ region. Uses caves and rock crevices for day roosting and winter hibernation. Nearest recorded occurrences are 25 mi southeast of the SEZ. About 3,580,326 acres of potentially suitable habitat occurs within the SEZ region.
Townsend's big-eared bat	*Corynorhinus townsendii*	BLM-S	Near forests and shrubland habitats below 9,000-ft elevation throughout the SEZ region. The species may use caves, mines, and buildings for day roosting and winter hibernation. Nearest recorded occurrences are about 10 mi north of the SEZ. About 3,197,836 acres of potentially suitable habitat occurs within the SEZ region.
Utah prairie dog	*Cynomys parvidens*	ESA-T	Endemic to southwestern Utah in grasslands in level mountain valleys and areas with deep, well-drained soils. Colonies reside in underground burrow systems, which are dynamic in size and location. Nearest recorded occurrences are about 5 mi north of the SEZ. Potentially suitable habitat occurs along Fourmile Wash about 3 mi north of the SEZ. About 573,137 acres of potentially suitable habitat occurs within the SEZ region.

[a] The listings for (1) federally listed, proposed for listing, or candidates for listing under the ESA, and (2) Utah BLM State Office sensitive species have been updated since the release of the Draft Solar PEIS.

[b] BLM-S = listed as a sensitive species by the BLM; ESA-C = candidate for listing under the ESA; ESA-T = listed as threatened under the ESA.

[c] For plant species, potentially suitable habitat was determined by using Southwest Regional Gap Analysis Project (SWReGAP) land cover types (USGS 2005). For terrestrial vertebrate species, potentially suitable habitat was determined by using SWReGAP habitat suitability and land cover models. Area of potentially suitable habitat for each species is presented for the SEZ region, which is defined as the area within 50 mi (80 km) of the SEZ center.

[d] To convert ft to m, multiply by 0.3048.

[e] To convert mi to km, multiply by 1.609.

[f] To convert acres to km^2, multiply by 0.004047.

[g] Species in bold text have been recorded or have designated critical habitat in the affected area.

Target species and survey protocols should be developed in coordination with the U.S. Fish and Wildlife Service and Arizona Game and Fish Department.

The Draft Solar PEIS presents a table of special status species for which potential impacts need to be evaluated prior to development in the proposed Escalante SEZ. The list of species presented in Table 13.1.12.1-1 of the Draft Solar PEIS also includes species listed by the State of Utah and species ranked by the State of Utah as S1 or S2 or species of concern. On the basis of design features presented in the Draft Solar PEIS, the potential for impacts on these additional species will also need to be addressed before development could occur in the SEZ.

- Identify and map the location and areal extent of woodland habitats within the SEZ. Woodland habitats that may occur in the area of direct effects include pinyon-juniper and oak/mahogany woodlands. The suitability of these woodland habitats for special status species should be determined. Species potentially associated with these habitats include the Nevada willowherb and northern goshawk (nesting habitat).

C.6.1.5.10 Air Quality and Climate

None.

C.6.1.5.11 Visual Resources

As indicated in the Draft Solar PEIS, the Escalante Valley SEZ is located within proximity of two sensitive visual resource areas (SVRAs), as well as several sensitive viewing locations (SVLs), such as towns and roadways. The SVRAs include the Old Spanish National Historic Trail and the Three Peaks Special Recreation Management Area (SRMA). Each of these areas would be subject to weak levels of visual contrast; higher contrast levels may be experienced in the peaks and northwest slopes of the Three Peaks SRMA.

The following steps could be taken to better understand potential impacts on these SVRAs and SVLs from solar development in the Escalante Valley SEZ:

- Identify key observation points (KOPs) within these areas through working with the management agency or other local stakeholders.

- Conduct viewshed analyses from the KOPs to determine how much of the SEZ would be in view from each KOP.

- As deemed necessary, based on viewshed analysis results, prepare wireframe Google Earth™ visualizations of hypothetical solar facilities in the SEZ depicting the 80% development scenario to better estimate potential impacts.

This additional analysis may help judge potential visual contrast more accurately for KOPs in these areas.

C.6.1.5.12 Acoustic Environment

None.

C.6.1.5.13 Paleontological Resources

The Escalante Valley SEZ is located in an area where the Potential Fossil Yield Classification of the SEZ has been determined to be Class 2. Therefore, the potential for impacts on paleontological resources is low. No additional data collection is needed at this time, although verification of this classification is recommended at a project-specific level.

C.6.1.5.14 Cultural Resources and Native American Concerns

Less than 4% of the proposed Escalante Valley SEZ has been surveyed (approximately 256 acres [1.0 km^2] out of 2 block survey projects and 8 linear surveys that cross into the SEZ).[31] At least five sites, possibly seven, have been recorded within the SEZ. Two of the sites are eligible for listing in the *National Register of Historic Places*. Cultural resource impacts are most likely in the southern and western portions of the SEZ, especially in the dune areas. No sites have been recorded in the northern and eastern portions. Approximately 60 sites have been recorded within 5 mi (8 km) of the SEZ. Significant prehistoric resources, including Paleoindian sites, are likely to be located in dune areas and around margins of the playa within the Escalante Valley SEZ. The Dominguez Escalante Trail and the Old Spanish National Historic Trail are both relatively close to the SEZ, within 6 mi (9.7 km). The destruction or degradation of important plant resources, and the destruction of habitat or impediments to the movement of culturally important wildlife, are also potential impacts of concern within the SEZ.

The following additional data collection efforts could reduce the uncertainty about potential impacts on cultural resources:

- Conduct a Class I literature file search to better understand (1) the site distribution pattern in the vicinity of the SEZ, (2) trail networks through existing ethnographic reports, and (3) overall cultural sensitivity of the landscape. The Class I search will also help to resolve the discrepancy between BLM and Utah State Historic Preservation Office data sets for this SEZ.

- Conduct a Class II Stratified Random Sample Survey of SEZ to obtain a 10% sample (roughly 661 acres [2.7 km^2]). If the roughly 256 acres (1.0 km^2)

[31] New information not presented in the Draft Solar PEIS.

previously surveyed meets current survey standards, then approximately 405 acres (1.6 km^2) of survey could satisfy a 10% sample. Areas of interest, as determined through a Class I review, should also be identified prior to establishing the survey design and sampling strategy, such as the dune areas and playa margin in the southwest portion of the SEZ. Subsurface testing of dune areas should be a component of the sampling strategy as well.

- Prepare a cultural sensitivity map based on results of the Class II survey and Class I review.

- Identify high potential segments of the Old Spanish National Historic Trail and viewshed analyses from key points along the trail. The closest point is within 6 mi (9.7 km), but is obscured from view at that location by Table Butte. Dominguez-Escalante Trail is not a National Historic Trail, but it is a very important historic trail that should potentially be investigated further**.**

- Continue with government-to-government consultation as described in Section 2.4.3, including follow-up to recent ethnographic studies with Tribes not included in the original studies to determine whether those Tribes have similar concerns. The Escalante Valley SEZ falls in the traditional use area of primarily the Southern Paiute, but also the Western Shoshone and Ute. Potential topics presented in the Draft Solar PEIS and/or in an ethnographic study with the Paiute Indian Tribe of Utah, representing the Southern Paiute, to be discussed during consultation include Table Butte, Parowan Gap, Doctor Rock, spiritual trail systems, mountain springs and other water sources, volcanic hot springs, habitation sites as places of cultural importance, clay and rock resources, burial sites, rock art, ceremonial areas and healing places, and plant and animal resources. The agencies value the information shared by the Tribes during the ethnographic study and will consider their input in striving to minimize the impacts of solar development in the SEZ. The completed ethnographic study will be available in its entirety on the Solar PEIS Web site (http://solareis.anl.gov). A summary of the contents of that report is also provided in the following text box.

Tribal Perspectives on the Significance of Escalante Valley SEZ

The Escalante Valley SEZ region was traditionally occupied, used, aboriginally owned, and historically related to the Numic-speaking peoples of the Great Basin and western Colorado Plateau. The Paiute Indian Tribe of Utah (PITU) field consultations, summarized here, represent the cultural interests of the Southern Paiute peoples. These Numic-speaking peoples have gone on record in past projects and stipulate here again that they are the American Indian people responsible for the cultural resources (natural and man-made) in this study area. Their ancestors were placed here by the Creator and have subsequently lived in these lands, maintaining and protecting these places, plants, animals, water sources, and cultural signs of their occupation.

PITU has participated in this PEIS in order to explain the meaning and cultural centrality of the plants, animals, spiritual trails, healing places, and places of historic encounters that exist in these lands.

Tribal Perspectives on the Significance of Escalante Valley SEZ (Cont.)

The area under discussion extends beyond the boundaries of the SEZ because Southern Paiute Tribal representatives maintain that, in order to understand Southern Paiute connections to the SEZ, it must be placed in context with neighboring places and their associated cultural resources.

The SEZ region includes plant communities located directly in the SEZ boundary, geological features and water sources located just outside the SEZ boundaries, and trail systems that people used from neighboring or distance communities that pass through the SEZ study area to reach nearby medicine and ceremonial areas.

The Escalante Valley SEZ region is in an active geothermal and volcanic area. Places that contain the presence of volcanic activity are considered sacred and powerful. Southern Paiute people believe that volcanic events are moments when Puha (power or energy) deep inside the earth is brought to the surface as a way for the land to renew itself and to distribute Puha across the landscape. For millennia, Indian people have traveled places of volcanic activity like Thermo Hot Springs (32 mi [51 km] northeast) to engage in a variety of ceremonial activities. These activities include the curing of individuals using both the sulfuric muds and the mineralized, hot water. Other Indian peoples came to the hot spring to purify themselves before going to distant destinations where special activities such as vision quests or ceremonial balancing activities would occur. Trails from many directions came to the hot spring, bringing people on pilgrimage between the hot springs and distant destinations.

The Indian Tribal representatives interviewed at the Escalante SEZ study area indicated that this place is especially important because of Sulphur Spring (5 mi [8 km] north), the traditional spring near Lund that served as both a stopping place for people seeking healing in the nearby hills and a community location. Sulphur Spring was a central place for travelers going back and forth across the Escalante Desert. Because of its regional centrality and because it had a permanent Indian community before the arrival of non-native people, Sulphur Spring was a place of social and ceremonial gathering.

The Doctor Rock (28 mi [45 km] northwest) was identified by Tribal representatives as a key cultural feature in the Escalante Valley SEZ study area. They described this as a traditional area used by Southern Paiute *Puha'gants* (shaman) to tend to people who are ill and in need of rebalancing and healing. The Puha'gants would conduct complex healing ceremonies that could only be performed in a place of Puha, such as a doctor rock. Similar to the Shoshone Doctor Rock located near the Gold Point SEZ and the town of Lida, Nevada, the Southern Paiute Doctor Rock draws its power from the volcanic flows above and below ground.
People traveling here from the east would pass through Parowan Gap (36 mi [58 km] east). A Southern Paiute Creation story explains the existence of the Parowan Gap in the middle of the volcanic ridge and the presence of thousands of rock peckings and rock paintings (called *tumpituxwinap* in Southern Paiute, meaning storied rocks).

Table Butte (4 mi [6 km] south) represents a major cultural feature the Escalante Valley SEZ region. Table Butte represents a powerful place in Southern Paiute epistemology because of its station in the Escalante Valley. It is a place of great contrast as a unique, isolated highpoint in the wide low valley. The butte gains additional power due to its hydrological role as a shedding point for water. Power is closely associated with water and its flow (Stoffle et al. 2001); thus, Table Butte represents an important element in shaping the movement of power in the immediate area.

Viewscapes are necessary for certain types of ceremonial activities. Viewscapes are essential for vision questing at the top of Mountain Spring Peak (16 mi [26 km] northwest) and Table Butte. The viewscape from the Doctor Rock has been a critical component of doctoring occurring in this area. From the Doctor Rock, a person has a view of Table Butte and the SEZ study area. Viewscapes such as this are important for ceremonial activity because they allow the Puha'gant to pray to nearby features and draw upon their power as he or she performs a given ceremony. These views need to be unobstructed; otherwise, there is a risk of disrupting the flow of Puha and the prayers and causing the ceremony to fail.

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Tribal Perspectives on the Significance of Escalante Valley SEZ (Cont.)

During multiple field visits, Native American representatives identified 16 traditional use plants and 27 traditional use animals within the Escalante Valley SEZ study area. The presence of these plants and animals both physically and spiritually add to the study area's overall cultural importance because they are associated with medicine, ceremony, and Creation. Animals play an important role in Creation and Origin stories and are viewed by Southern Paiute people as Creator beings. These animals include the coyote, cottontail rabbit, deer, red-tailed hawks, and rattlesnakes.

C.6.1.5.15 Socioeconomics and Environmental Justice

None.

C.6.1.5.16 Cumulative Impact Considerations

None.

C.6.2 Milford Flats South

C.6.2.1 Summary of Potential Impacts Identified in the Draft Solar Programmatic Environmental Impact Statement (PEIS)

The proposed Milford Flats South solar energy zone (SEZ), as presented in the Draft Solar PEIS, had a total area of 6,480 acres (26 km^2). It is located in Beaver County in southwestern Utah (Figure C.6.2-1). The towns of Minersville and Milford are about 5 mi (8 km) east of, and 13 mi (21 km) north–northeast of, the SEZ respectively

The Draft Solar PEIS identified a 345-kV transmission line that runs north to south about 19 mi (31 km) southeast of the eastern boundary of the SEZ as the nearest point of connection of the SEZ to the grid. The location of new transmission that could be constructed for this SEZ in the future may be different from that assumed in the Draft Solar PEIS. Details on the updated transmission impact assessment to be included in the Final Solar PEIS are provided in Section C.7.1 of this appendix. The Draft Solar PEIS also identified State Route 21/130, located about 5 mi (8 km) to the east of the SEZ, as the nearest major road, and assumed that a new access road would be constructed from the proposed SEZ to State Route 21/130 to support development. As for a new transmission line, the location of a new access road that could be constructed in the future may be different from that assumed in the Draft Solar PEIS. Analysis of transmission lines and/or access roads will be completed, as necessary, as part of the project-specific environmental reviews (see Section 2.2.2.2.2 of this Supplement).

Potential adverse impacts identified in the Draft Solar PEIS included the following:

- Solar development would require coordination with existing rights-of way for two energy pipelines, one power line, two roads, and one telecommunications line crossing the SEZ.

- There could be a 10 to 13% reduction in two grazing allotments that could have potential adverse economic impacts on six permittees.

- Impacts on soil resources (e.g., soil compaction, soil horizon mixing, soil erosion and deposition by wind and runoff, sedimentation, and soil contamination) could occur.

- Groundwater use would deplete the aquifer to the extent that, at a minimum, wet-cooling options would not be feasible.

- Clearing of a large portion of the proposed SEZ could primarily affect salt desertscrub, big sagebrush shrubland, semidesert shrub steppe, and greasewood flats and may adversely affect dry washes, depending on the amount of available habitat disturbed. The establishment of noxious weeds could result in habitat degradation. Deposition of fugitive dust could cause reduced productivity or changes in plant community structure.

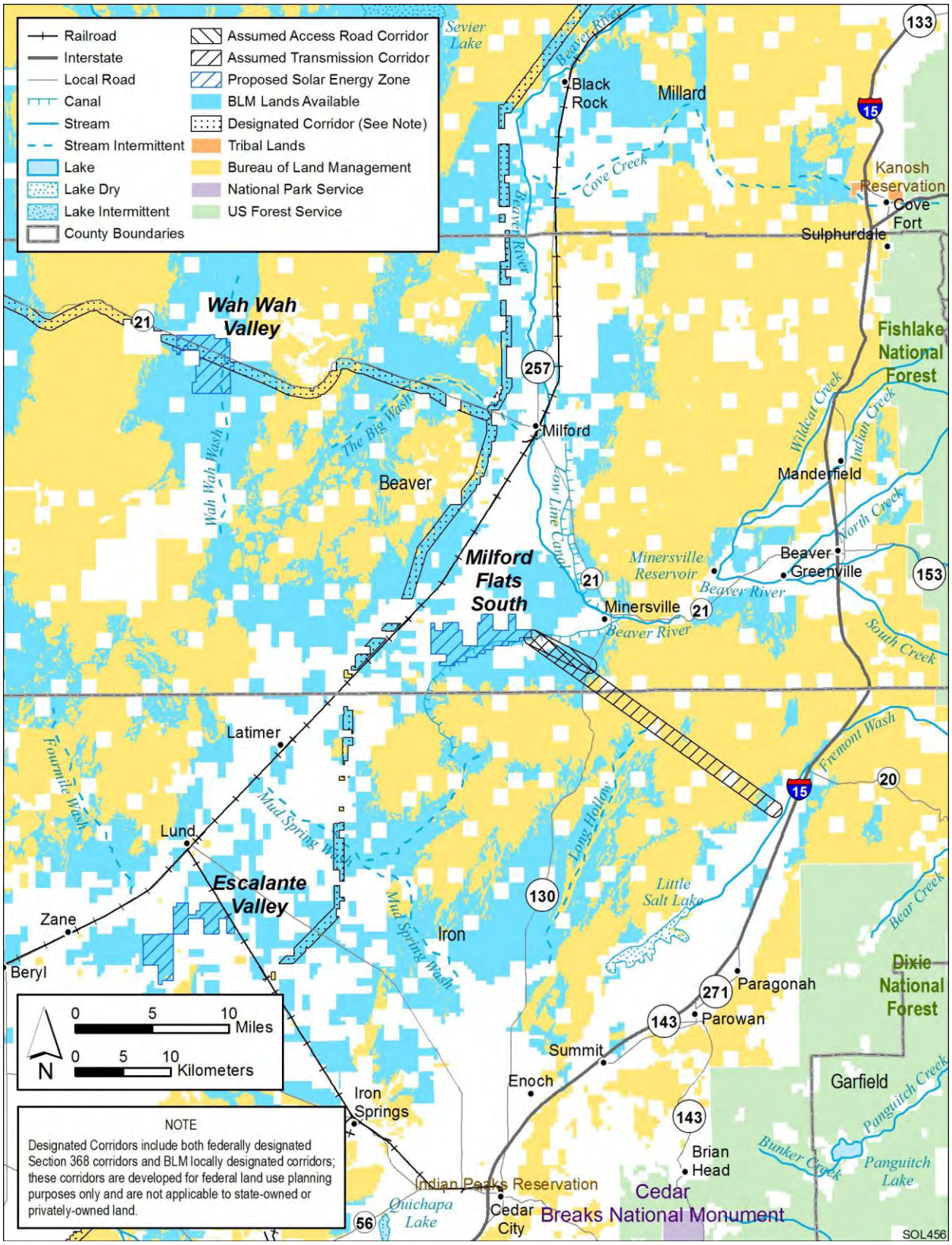

FIGURE C.6.2-1 Proposed Milford Flats South SEZ as Presented in the Draft Solar PEIS

- Potentially suitable habitat for 20 special status species and more than 70 wildlife species occurs in the affected area of the proposed SEZ; less than 1.0% of the potentially suitable habitat for any of these species occurs in the region that would be directly affected by development. Development within Minersville Canal could adversely affect amphibians, birds, and mammals.

- If aquatic biota are present, they could be affected by the direct removal of surface water features within the construction footprint. If present, aquatic biota could also be affected by a decline in habitat quantity and quality due to water withdrawals, changes in drainage patterns, as well as increased sediment and contaminant inputs associated with ground disturbance and construction activities.

- Temporary exceedance of ambient air quality standards for particulate matter at the SEZ boundaries is possible during construction. These high concentrations, however, would be limited to the immediate area surrounding the SEZ boundary.

- Although the SEZ is in an area of low scenic quality, strong visual contrasts could be observed by residents nearest to the SEZ. Travelers on State Routes 21 and 129 might observe moderate levels of visual contrast associated with solar development within the SEZ.

- During operations, noise levels at the nearest residences could be about equal to the Iron County regulation level if concentrating solar power facilities with energy storage technologies (which could extend the daily operational time by 6 hours or more) were used at the SEZ.

- Few, if any, impacts on significant paleontological resources are likely to occur.

- Low-income populations occur within a 50-mi (80-km) radius of the proposed SEZ boundary; thus adverse impacts of solar development could disproportionately affect low-income populations.

C.6.2.2 Summary of Comments Received

Most of the comments received on the proposed Milford Flats South SEZ were in favor of identifying the area as an SEZ and cited that the region is already fragmented and has low habitat value for many species (The Wilderness Society et al.,[32] Sierra Club, Wild Utah, HEAL

[32] The Wilderness Society, Wild Utah Project, Southern Utah Wilderness Alliance, Grand Canyon Trust, Center for Native Ecosystems, Sierra Club, Natural Resources Defense Council, Soda Mountain Wilderness Council, and Sierra Trek submitted joint comments on the proposed Utah SEZs. Those comments are attributed to The Wilderness Society et al.

Utah, and others). The National Park Service (NPS) was concerned that development of the SEZ would have a 12% impact on Utah prairie dog habitat, which is a substantial portion of this species' available and potentially suitable habitat in the Utah West Desert. The NPS recommends that additional analysis of the impacts on the Utah prairie dog be provided in the Final Solar PEIS for the proposed Utah SEZs, including cumulative impact analysis. The NPS also recommended that additional analysis be provided in the Final Solar PEIS for impacts on the greater sage-grouse for the proposed SEZs in Utah, and that analysis regarding effectiveness of design features that avoid lek and nesting habitat should be conducted for each SEZ. The U.S. Fish and Wildlife Service (USFWS) commented that the assumed transmission corridor would cross greater sage-grouse brood-rearing habitat for the Black Mountains-Mineral East leks and is also part of the Bald Hills Bird Habitat Conservation Area. The USFWS recommended that the PEIS use the existing designated transmission corridor adjacent to and on the west side of the SEZ.

The Wilderness Society et al. indicated that the Utah Division of Wildlife Resources (UDWR) quad-level occurrences for greater sage-grouse intersect the SEZ itself, not just the affected area. The Wilderness Society et al. suggested use of a different transmission line and access road route than were assumed in the Draft Solar PEIS to minimize surface disturbance. The Wilderness Society et al. is also concerned with the fragile soil and potential for fugitive dust generation at the proposed Milford Flats South SEZ. The Western Watersheds Projects requested that the cumulative impacts assessment include analysis of the impacts of expected new road construction, and new transmission lines and upgrades on the greater sage-grouse, western burrowing owl, ferruginous hawk, pygmy rabbit, bald eagle, and Utah prairie dog.

C.6.2.3 Changes to the SEZ

No boundary revisions were identified for the proposed SEZ. However, areas specified for non-development under SEZ-specific design features were mapped, where data were available. For the proposed Milford Flats South SEZ, 228 acres (0.9 km^2) composing the Minersville Canal were identified as a non-development area (see Figure C.6.2-2). The remaining developable area within the SEZ is 6,252 acres (25.3 km^2).

C.6.2.4 Wilderness Character Status of SEZ

A recently maintained inventory of wilderness characteristics was used to determine whether public lands within the Milford Flats South SEZ have wilderness characteristics. The finding of this inventory was that these lands do not contain wilderness characteristics.

C.6.2.5 Additional Data Collection Recommended

C.6.2.5.1 Lands and Realty

None.

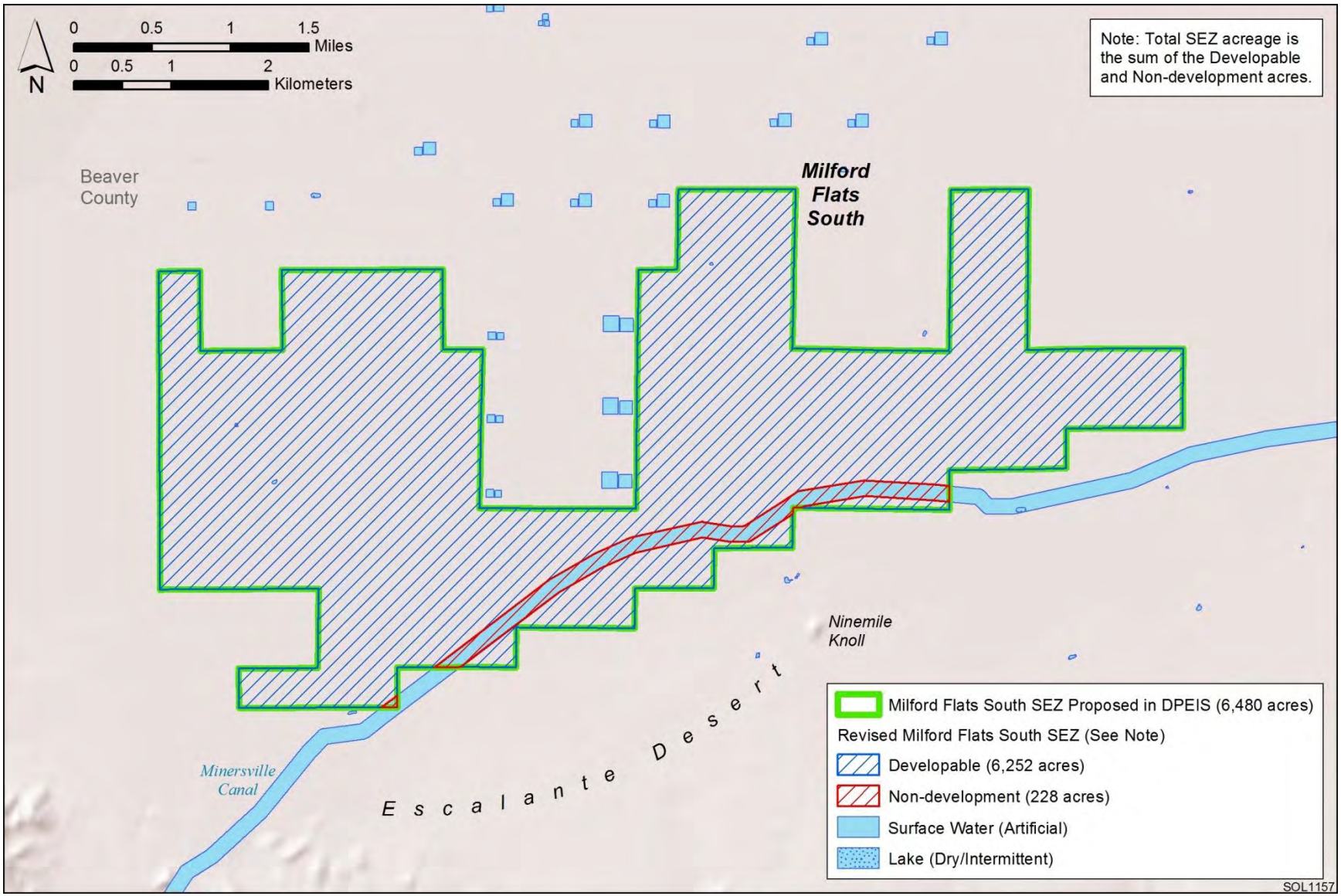

FIGURE C.6.2-2 Proposed Milford Flats South SEZ as Described in this Supplement

C.6.2.5.2 Specially Designated Areas and Lands with Wilderness Characteristics

None.

C.6.2.5.3 Rangeland Resources

Livestock Grazing. None.

Wild Horses and Burros. None.

C.6.2.5.4 Recreation

The status of off-highway vehicle use designations in the area will be reviewed with U.S. Department of the Interior Bureau of Land Management (BLM) field office staff.

C.6.2.5.5 Military and Civilian Aviation

None.

C.6.2.5.6 Geologic Setting and Soil Resources

None.

C.6.2.5.7 Minerals

Additional information on leasable and strategic minerals in the vicinity of the proposed SEZ will be provided in the Final PEIS to inform the Department of the Interior's decision on a proposed 20-year withdrawal of SEZ lands.

C.6.2.5.8 Water Resources

The following additional data and actions would help further characterize potential impacts on water resources for the proposed Milford Flats South SEZ. A more detailed discussion of each of these activities is included in the water resources action plan provided in Section C.7.2 of this appendix.

- Prepare a planning-level water resources inventory of the Milford area basin.

- Identify additional dry lakes, ephemeral stream channels and alluvial fan features for non-development areas through consultation with BLM Utah, Utah Division of Water Resources, Utah Division of Water Rights Stream Alteration Program, U.S. Environmental Protection Agency, and U.S. Army Corps of Engineers (USACE) with a focus on:
  - Unnamed washes throughout the SEZ draining north and northwest off of the Black Mountains, and
  - The agricultural ditches in the southern portion of the SEZ.

- Perform field surveys and hydrologic analyses to support jurisdictional water determinations and floodplain identifications. Tasks include:
  - Surveying unnamed washes for surface elevations, high water marks, and sediment conditions, and
  - Conducting hydrologic rainfall-runoff-routing analyses to identify 100-year floodplain areas.

- Coordinate with the USACE (Sacramento District) regarding jurisdictional water determinations for the SEZ. Water features to be considered include:
  - Unnamed washes.

- Identify 100-year floodplain non-development areas (if they exist) for unnamed washes identified during the field survey. This task would require coordination with the Federal Emergency Management Agency and the following agencies:
  - Utah Department of Public Safety, and
  - Utah Geological Survey.

- Describe the formation of a stakeholder committee to conduct long-term monitoring of water resources. This activity would entail:
  - Identifying key stakeholder agencies,
  - Discussing general features of a monitoring program, and
  - Working with the U.S. Geological Survey to develop groundwater monitoring well design and numerical groundwater models.

- Develop a simple, numerical groundwater model for the Milford area basin to evaluate the potential impacts of full build-out. This activity would entail:
  - Assessing the potential for drawdown impacts on the basin, which is already in overdraft, including the potential for land subsidence.

C.6.2.5.9 Ecological Resources

Vegetation and Plant Communities. The following additional data-gathering action would help further characterize potential impacts on wildlife resources for the SEZ:

- Identify and map the location and areal extent of dry wash and greasewood flat habitats within the SEZ. Identify and map the location and areal extent of these habitats, as well as playa and riparian habitats, outside the SEZ that may be affected by hydrologic changes, including groundwater elevations and changes in water, sediment, and contaminant inputs associated with runoff. Such efforts could help determine habitat characteristics, including water source, hydrologic regime, and dominant plant species.

Wildlife. The following additional data-gathering actions would help further characterize potential impacts on wildlife resources for the SEZ:

- Conduct pre-disturbance surveys within the SEZ to determine the use of the SEZ as a movement/migratory corridor or as important habitat for mule deer and pronghorn.

- Identify and map the location and areal extent of playa habitat within the SEZ. Wildlife surveys should be conducted along Minersville Canal in order to confirm that the non-development area identified for this feature is adequate to protect amphibian, bird, and mammal species. These areas provide important habitat for a number of wildlife species.

Aquatic Biota. Investigations recommended under the water resources action plan (Section C.6.2.5.8) would be useful in characterizing and protecting habitat available to aquatic biota. Washes in the Milford Flats South SEZ are typically dry. These surface water features may or may not contain aquatic biota; therefore, preliminary evaluations of these features could be conducted to determine the potential for aquatic communities to be present.

Special Status Species. The following additional data-gathering actions would be useful in further characterizing and protecting habitat available to special status species:

- Conduct pre-disturbance surveys within the SEZ to determine the presence and abundance of those special status species that are (1) federally listed, proposed for listing, or candidates for listing under the Endangered Species Act (ESA); or (2) designated as sensitive by the Utah BLM State Office. These species are listed in Table C.6.2-1. Surveys should focus on areas identified as potentially suitable, and the suitability of these habitats to support these special status species should be determined in the field. All field-determined suitable habitats for special status species should be mapped. Target species and survey protocols should be developed in coordination with the USFWS and UDWR.

  The Draft Solar PEIS presents a table of special status species for which potential impacts need to be evaluated prior to development in the proposed

TABLE C.6.2-1 Special Status Species That May Occur in the Vicinity of the Proposed Milford Flats South SEZ[a]

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Plants			
Compact cat's-eye	*Cryptantha compacta*	BLM-S	Salt desert shrub and mixed shrub communities at elevations between 5,000 and 8,400 ft.[d] Known from southwestern Millard County and northwestern Beaver County, Utah, and eastern Nevada. Nearest recorded occurrence is 45 mi[e] northwest of the SEZ. About 2,430,377 acres[f] of potentially suitable habitat occurs within the SEZ region.
Jone's globemallow	*Sphaeralcea caespitosa*	BLM-S	Known from at least four occurrences in western Utah and six occurrences in eastern Nevada on federal and state lands on dolomite calcareous soils in association with mixed shrub, pinyon-juniper, and grassland communities at elevations between 5,000 and 6,500 ft. Nearest recorded occurrence is 27 mi northwest of the SEZ. About 4,077,164 acres of potentially suitable habitat occurs within the SEZ region.
Long-calyx milkvetch	*Astragalus oophorus lonchocalyx*	BLM-S	Endemic to the Great Basin in western Utah and eastern Nevada in pinyon-juniper woodlands, sagebrush, and mixed shrub communities at elevations between 5,800 and 7,500 ft. Nearest recorded occurrences are 12 mi east of the SEZ. About 3,961,336 acres of potentially suitable habitat occurs within the SEZ region.
Money wild buckwheat	*Eriogonum nummulare*	BLM-S	Western Utah and eastern Nevada on gravelly washes, flats, and slopes in saltbush and sagebrush communities and pinyon-juniper woodlands. Nearest recorded occurrence is 40 mi northwest of the SEZ. About 3,468,227 acres of potentially suitable habitat occurs within the SEZ region.
Birds			
American white pelican	*Pelecanus erythrorhynchos*	BLM-S	May occur as a summer resident and migrant in large reservoirs within the SEZ region. Species is likely to be a transient only in the vicinity of the SEZ. Nearest recorded occurrence is from the Minersville Reservoir, approximately 11 mi east of the SEZ. About 81,437 acres of potentially suitable habitat occurs within the SEZ region.
Bald eagle	*Haliaeetus leucocephalus*	BLM-S	Known as a winter resident throughout the SEZ region, most commonly along large bodies of water where fish and waterfowl prey are available. Wintering areas are associated with open water. May occasionally forage in arid shrubland habitats. Nearest recorded occurrences are from the Beaver River within 10 mi east of the SEZ. About 2,540,607 acres of potentially suitable habitat occurs within the SEZ region.
Ferruginous hawk[g]	***Buteo regalis***	BLM-S	A year-round resident in the SEZ affected area. Grasslands, shrublands, agricultural lands, and the periphery of pinyon-juniper forests throughout the SEZ region. Quad-level occurrences intersect the SEZ and other portions of the affected area. About 1,761,837 acres of potentially suitable habitat occurs within the SEZ region.

TABLE C.6.2-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Birds (Cont.)			
Greater sage-grouse	***Centrocercus urophasianus***	ESA-C; BLM-S	A year-round resident in the SEZ region. Plains, foothills, and mountain valleys dominated by sagebrush throughout the SEZ region. Lek sites are located in relatively open areas surrounded by sagebrush or in areas where sagebrush density is low. Nesting usually occurs on the ground where sagebrush density is higher. Quad-level occurrences intersect the affected area east of the SEZ. Crucial brooding habitat for the species exists about 1 mi south of the SEZ and intersects the transmission corridor. About 1,646,504 acres of potentially suitable habitat occurs within the SEZ region.
Long-billed Curlew	*Numenius americanus*	BLM-S	Summer resident and migrant throughout the SEZ region in short-grass grasslands near standing water. Species is likely to be transient only in the vicinity of the SEZ. Nearest recorded occurrences are from the Beaver River, approximately 10 mi east of the SEZ. About 285,000 acres of potentially suitable habitat occurs within the SEZ region.
Northern Goshawk	*Accipiter gentilis*	BLM-S	A year-round resident in the SEZ region. Mature mountain forest and riparian zone habitats throughout the SEZ region. Nests in trees in mature deciduous, coniferous, and mixed forests. Forages in both heavily forested and relatively open shrubland habitats. Nearest recorded occurrences are approximately 18 mi southeast of the SEZ. About 704,300 acres of potentially suitable habitat occurs within the SEZ region.
Short-eared owl	***Asio flammeus***	BLM-S	A year-round resident in portions of the SEZ region, although only winter (nonbreeding) habitat is expected to occur in the affected area. Grasslands, shrublands, and other open habitats throughout the SEZ region. Quad-level occurrences intersect the SEZ and other portions of the affected area. About 3,938,700 acres of potentially suitable habitat occurs within the SEZ region.
Western burrowing owl	***Athene cunicularia hypugaea***	BLM-S	A year-round resident in the SEZ region. Open grasslands and prairies, as well as disturbed sites such as golf courses, cemeteries, and airports throughout the SEZ region. Nests in burrows constructed by mammals (prairie dog, badger, etc.). Quad-level occurrences intersect the SEZ and other portions of the affected area. About 2,432,600 acres of potentially suitable habitat occurs within the SEZ region.
Mammals			
Dark kangaroo mouse	***Microdiposops megacephalus***	BLM-S	Occurs in the Great Basin region in sagebrush-dominated areas with sandy soils. Nocturnally active during warm weather, the species remains in underground burrows during the day and cold winter months. Quad-level occurrences intersect the SEZ and other portions of the affected area. About 620,100 acres of potentially suitable habitat occurs within the SEZ region.
Fringed myotis	*Myotis thysanodes*	BLM-S	Wide range of habitats, including lowland riparian, desert shrub, pinyon-juniper, and sagebrush habitats. Roost sites have been reported in buildings and caves. Nearest recorded occurrences are 40 mi southeast of the SEZ. About 4,555,400 acres of potentially suitable habitat occurs within the SEZ region.

TABLE C.6.2-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Mammals (Cont.)			
Kit fox	***Vulpes macrotis***	BLM-S	Open prairie, plains, and desert habitats where it inhabits burrows and preys on rodents, rabbits, hares, and small birds. Quad-level occurrences intersect the affected area north of the SEZ. About 1,960,500 acres of potentially suitable habitat occurs within the SEZ region.
Pygmy rabbit	*Brachylagus idahoensis*	BLM-S	Sagebrush-shrubland habitats throughout the SEZ region. Prefers loose soils to dig burrows. Nearest recorded occurrences are about 10 mi southeast of the SEZ. About 967,900 acres of potentially suitable habitat occurs within the SEZ region.
Spotted bat	*Euderma maculatum*	BLM-S	Near forests and shrubland habitats throughout the SEZ region. Uses caves and rock crevices for day roosting and winter hibernation. Nearest recorded occurrences are 15 mi north of the SEZ. About 3,269,200 acres of potentially suitable habitat occurs within the SEZ region.
Townsend's big-eared bat	***Corynorhinus townsendii***	BLM-S	Near forests and shrubland habitats below 9,000-ft elevation throughout the SEZ region. The species may use caves, mines, and buildings for day roosting and winter hibernation. Quad-level occurrences intersect the affected area north of the SEZ. About 3,111,000 acres of potentially suitable habitat occurs within the SEZ region.
Utah prairie dog	***Cynomys parvidens***	ESA-T	Endemic to southwestern Utah in grasslands in level mountain valleys and areas with deep, well-drained soils. Colonies reside in underground burrow systems, which are dynamic in size and location. Quad-level occurrences intersect the affected area south of the SEZ. Colonies are known to occur outside of the affected area within 10 mi south of the SEZ. About 825,000 acres of potentially suitable habitat occurs within the SEZ region.

[a] The listings for (1) federally listed, proposed for listing, or candidates for listing under the ESA, and (2) Utah BLM State Office sensitive species have been updated since the release of the Draft Solar PEIS.

[b] BLM-S = listed as a sensitive species by the BLM; ESA-C = candidate for listing under the ESA; ESA-T = listed as threatened under the ESA.

[c] For plant species, potentially suitable habitat was determined by using Southwest Regional Gap Analysis Project (SWReGAP) land cover types (USGS 2005). For terrestrial vertebrate species, potentially suitable habitat was determined by using SWReGAP habitat suitability and land cover models. Area of potentially suitable habitat for each species is presented for the SEZ region, which is defined as the area within 50 mi (80 km) of the SEZ center.

[d] To convert ft to m, multiply by 0.3048.

[e] To convert mi to km, multiply by 1.609.

[f] To convert acres to km^2, multiply by 0.004047.

[g] Species in bold text have been recorded or have designated critical habitat in the affected area.

Milford Flats South SEZ. The list of species presented in Table 13.2.12.1-1 of the Draft Solar PEIS also includes species listed by the State of Utah and species ranked S1 or S2 or as species of concern by the State of Utah. Based on the design features presented in the Draft Solar PEIS, the potential for impacts on these additional species will also need to be addressed before development could occur in the SEZ.

- Identify and map the location and areal extent of woodland habitats within the SEZ. Woodland habitats that may occur in the area of direct effects include pinyon-juniper and oak/mahogany woodlands. The suitability of these woodland habitats for special status species should be determined. Species potentially associated with these habitats include the ferruginous hawk (nesting) and northern goshawk (nesting).

- Identify and map the location and areal extent of rocky cliffs and outcrops within the area of direct effects (particularly within the assumed transmission corridor). These habitats may be potential roost sites for special status bat species, including the fringed myotis, spotted bat, and Townsend's big-eared bat.

C.6.2.5.10 Air Quality and Climate

None.

C.6.2.5.11 Visual Resources

A summary of the Draft Solar PEIS visual contrast analysis for the proposed Milford Flats South SEZ is provided in Table C.6.2-2. This table includes only the resources that would be subject to moderate visual contrast. As indicated in the Draft Solar PEIS, solar development within the Milford Flats South SEZ is unlikely to cause even moderate visual impacts on highly sensitive visual resource areas (SVRAs), the closest of which is more than 25 mi (40 km) from the SEZ. The closest community is about 5 mi (8 km) from the SEZ and is likely to experience weak visual contrasts from solar development within the SEZ. The Milford Flats South SEZ is located within proximity of sensitive viewing locations (SVLs) along State Routes 21 and 129. Moderate levels of visual contrast associated with solar development within the SEZ may be observed by travelers on these routes.

The following steps may be taken to better understand potential impacts on these SVLs from solar development in the Milford Flats South SEZ:

- Identify key observation points (KOPs) within these areas through working with the management agency or other local stakeholders.

TABLE C.6.2-2 Summary of Potential Visual Impacts on SVRAs and SVLs within the 25-mi (40-km) Viewshed of the Milford Flats South SEZ

Management Area Category	SVRA/SVL within 25 mi[a] of SEZ	Total Acreage/ Mileage[a] of SVRA/SVL	Distance from SEZ at Point of Closest Approach[c]	Total Acreage/Mileage Visible within 25 mi	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes
Other Areas of Interest (non-management areas)	State Route 21	NA[b]	5 mi from the SEZ	NA	NA	Travelers on State Route 21 might observe moderate levels of visual contrast associated with solar development within the SEZ.
	State Route 129	NA	3.2 mi from the SEZ	NA	NA	Travelers on State Route 129 might observe moderate levels of visual contrast associated with solar development within the SEZ.

[a] To convert mi to km, multiply by 1.609.

[b] NA = data not available.

[c] Distances are based on the Draft Solar PEIS analysis dated December 2010; any alterations to the SEZ boundaries may result in changes to the distance at the point of closest approach.

- Conduct viewshed analyses from the KOPs to determine how much of the SEZ would be in view from each KOP.

- As deemed necessary, based on viewshed analysis results, prepare wireframe Google Earth™ visualizations of hypothetical solar facilities in the SEZ depicting the 80% development scenario to better estimate potential impacts.

This additional analysis may help judge potential visual contrast more accurately for most KOPs. For KOPs of particularly high sensitivity, a site visit with photography and superimposition of the wireframe models onto the photos might be required or desired.

C.6.2.5.12 Acoustic Environment

None.

C.6.2.5.13 Paleontological Resources

The Milford Flats South SEZ is located in an area where the Potential Fossil Yield Classification of the SEZ has been determined to be Class 2. Therefore, the potential for impacts on paleontological resources is low. No additional data collection is needed at this time, although verification of this classification is recommended at a project-specific level.

C.6.2.5.14 Cultural Resources and Native American Concerns

Less than 2% of the proposed Milford Flats South SEZ has been surveyed (approximately 123 acres [0.5 km^2] out of 9 linear surveys that cross into the SEZ[33]). No sites have been recorded within the SEZ. Although a 1935 Bell System Telephone Line is eligible for listing in the *National Register of Historic Places* and may go through the SEZ, the line has been previously mitigated through documentation. Approximately 100 sites have been recorded within 5 mi (8 km) of the SEZ, mostly in higher elevations or along long, linear survey corridors; the sites recorded closest to the SEZ (on the valley floor within 2 mi [3 km]) have been determined not eligible for listing in the NRHP. The low density of sites recorded in basin interiors in this region suggests the potential for significant sites within the SEZ is low (Dalley 2009). The destruction or degradation of important plant resources, and the destruction of habitat or impediments to the movement of culturally important wildlife, are also potential impacts of concern within the SEZ.

The following additional data collection efforts could reduce the uncertainty about potential impacts on cultural resources:

[33] New information not provided in the Draft Solar PEIS.

- Conduct a Class I literature file search to better understand (1) the site distribution pattern in the vicinity of the SEZ, (2) trail networks through existing ethnographic reports, and (3) overall cultural sensitivity of the landscape.

- Conduct a Class II Stratified Random Sample Survey of the SEZ to obtain a 10% sample (roughly 648 acres [2.6 km^2]). If the roughly 123 acres (0.5 km^2) previously surveyed meets current survey standards, then approximately 525 acres (2.1 km^2) of survey could satisfy a 10% sample. Areas of interest, as determined through a Class I review, should also be identified prior to establishing the survey design and sampling strategy.

- Prepare a cultural sensitivity map based on results of the Class II survey and Class I review.

- Continue with government-to-government consultation as described in Section 2.4.3, including follow-up to recent ethnographic studies with Tribes not included in the original studies to determine whether those Tribes have similar concerns. The Milford Flats South SEZ falls in the traditional use area of primarily the Southern Paiute, but also the Western Shoshone and Ute. Potential topics to be discussed during consultation include trail systems, mountain springs, habitation sites as places of cultural importance, clay and rock resources, burial sites, rock art, ceremonial areas, and plant and animal resources. The agencies value the information shared by the Tribes during the ethnographic study and will consider their input in striving to minimize the impacts of solar development in the SEZ. The completed ethnographic study will be available in its entirety on the Solar PEIS Web (http://solareis.anl.gov). A summary of the contents of that report is also provided in the following text box.

Tribal Perspectives on the Significance of Milford Flats South SEZ

The Milford Flats South SEZ region was traditionally occupied, used, aboriginally owned, and historically related to the Numic-speaking peoples of the Great Basin and western Colorado Plateau. The Paiute Indian Tribe of Utah (PITU) field consultations summarized here represent the cultural interests of the Southern Paiute peoples. Numic-speaking peoples have gone on record in past projects and stipulate here again that they are the American Indian people responsible for the cultural resources (natural and man-made) in this study area. Their ancestors were placed here by the Creator and they have subsequently lived in these lands, maintaining and protecting these places, plants, animals, water sources, and other cultural signs of their occupation. Southern Paiute people have a deeply rooted spiritual connection to the land that weaves stories and songs into the landscape, connecting all elements of the universe.

These Numic-speaking peoples further stipulate that because they have lived in these lands since the end of the Pleistocene and throughout the Holocene, a period of approximately 15,000 years, they deeply understand dramatic shifts in climate and ecology that have occurred over these millennia. Indian lifeways were dramatically

Tribal Perspectives on the Significance of Milford Flats South SEZ (Cont.)

influenced by these natural shifts, but certain religious and ceremonial practices continued unchanged. These traditional ecological understandings are carried from generation to generation through the recounting of origin stories occurring in mythic times and by strict cultural and natural resource conservation rules. The involved American Indian Tribal governments and their appointed cultural representatives have participated in this PEIS in order to explain the meaning and cultural centrality of the plants, animals, spiritual trails, healing places, and places of historic encounters that exist in these lands.

Southern Paiute Tribal representatives maintain that, in order to understand Southern Paiute connections to the SEZ, they must be placed in context with neighboring places and their associated cultural resources found in the larger SEZ region surrounding it. During the ethnographic field sessions, Tribal representatives identified the Milford Flats South SEZ study area as being part of a large regional ceremonial landscape that contains many traditional use features like hot springs, volcanic places, and important plants and animals.

The Milford Flats South SEZ region is in an active geothermal and volcanic area. Places that contain the presence of volcanic activity are considered sacred and powerful locations. Southern Paiute people believe that volcanic events are moments when *Puha* (power or energy) deep inside the Earth is brought to the surface as a way for the land to renew itself or be reborn. Volcanism is also a way for Puha to be distributed across a landscape.

According to interviews with Indian Tribal representatives, the outstanding feature of the Milford Flats South SEZ study area is the Thermo Hot Spring. These hot springs are located approximately 4 mi (6 km) west of the Milford Flats South SEZ boundary.

For millennia, Indian people have traveled to this special hot spring to engage in a variety of ceremonial activities. These activities include the curing of individuals using both the sulfuric muds and the mineralized, hot waters. Other Indian peoples came to the hot spring to purify themselves before going to distant destinations where special activities such as vision quests or ceremonial balancing activities would occur. The hot springs were also visited so Indian people could acquire songs Puha needed to help their communities when they returned. Trails from many directions come to the hot spring, bringing people on pilgrimage between the hot spring and distant destinations. Offerings would have been made to the hot spring and along the trails while the pilgrims were traveling. The trail system was so well developed that it led the first European travelers (those on the Dominguez-Escalante Expedition in 1776) to this special destination.

The viewscape at the Thermo Hot Springs provides a clear panorama of neighboring volcanic hills and the surrounding mountain ranges. Numic-speaking peoples believe that viewscapes are critical components of ceremonial activity because they allow a person to send prayers to important cultural landmarks.

Traditional trails in the SEZ region connect ceremonial areas like Parowan Gap and Thermo Hot Springs. Parowan Gap is located some 32 mi (51 km) south of the SEZ boundary. Parowan Gap is associated with a Southern Paiute Creation story that explains the existence of the gap in the middle of the volcanic ridge and the presence of thousands of rock peckings and rock paintings (called *tumpituxwinap* in Southern Paiute, meaning storied rocks). This area has a clear viewscape of the Escalante Desert.

During PITU's field visit, representatives identified 19 traditional-use plants and 28 traditional-use animals within this SEZ study area. Identified plants include those used for ceremonial, medicine, food, and utilitarian functions. The presence of animals in an area contributes to the overall cultural importance of an area to Indian people. In Southern Paiute culture, animals factor significantly in songs, stories, and ceremonies. Animals were also important food sources, and their fur, bones, and feathers were used in the construction of various cultural items and tools. One animal that had specially meaning for this site was the mountain sheep. Mountain sheep are believed to be spiritual animals and are sprit helpers to shaman.

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C.6.2.5.15 Socioeconomics and Environmental Justice

None.

C.6.2.5.16 Cumulative Impact Considerations

None.

C.6.3 Wah Wah Valley

C.6.3.1 Summary of Potential Impacts Identified in the Draft Solar Programmatic Environmental Impact Statement (PEIS)

The proposed Wah Wah Valley solar energy zone (SEZ), as presented in the Draft Solar PEIS, had a total area of 6,097 acres (25 km^2). It is located in Beaver County in southwestern Utah (Figure C.6.3-1). The town of Milford is located about 23 mi (37 km) east of the SEZ.

A designated Section 368 designated energy corridor on U.S. Department of the Interior Bureau of Land Management (BLM) lands runs east–west through the site along State Route 21 and would limit development in the SEZ because solar facilities cannot be constructed under transmission lines or over pipelines.[34] The Draft Solar PEIS discussion of impacts of solar energy development in the SEZ acknowledged that solar facility development on both sides of the corridor would limit the ability to add future corridor capacity.

The Draft Solar PEIS identified a 130-kV transmission line about 42 mi (68 km) east of the SEZ as the nearest point of connection of the SEZ to the grid. The location of new transmission that could be constructed for this SEZ in the future may be different from that assumed in the Draft Solar PEIS. Details on the updated transmission impact assessment to be included in the Final Solar PEIS are provided in Section C.7.1 of this appendix. Analysis of transmission lines and/or access roads will be completed as necessary as part of the project-specific environmental reviews (see Section 2.2.2.2.2 of this Supplement).

Potential adverse impacts identified in the Draft Solar PEIS included the following:

- There would be varying degrees of adverse impact on wilderness values in one Wilderness Study Area (WSA) and two wilderness inventory units.
- Less than 3% of one grazing allotment could be removed from grazing with small potential impact on one permittee.
- Impacts on soil resources (e.g., soil compaction, soil horizon mixing, soil erosion and deposition by wind and runoff, sedimentation, and soil contamination) could occur.

[34] Section 368 of the Energy Policy Act of 2005 (Public Law 109-58) required federal agencies to engage in transmission corridor planning (see Section 1.6.2.1 of the Draft Solar PEIS). As a result of this mandate, the BLM, U.S. Department of Energy (DOE), U.S. Forest Service (USFS), and U.S. Department of Defense (DoD) prepared a PEIS to evaluate the designation of energy corridors on federal lands in 11 western states, including the 6 states evaluated in this study (DOE and DOI 2008). The BLM and USFS issued Records of Decision to amend their respective land use plans to designate numerous corridors, often referred to as Section 368 corridors.

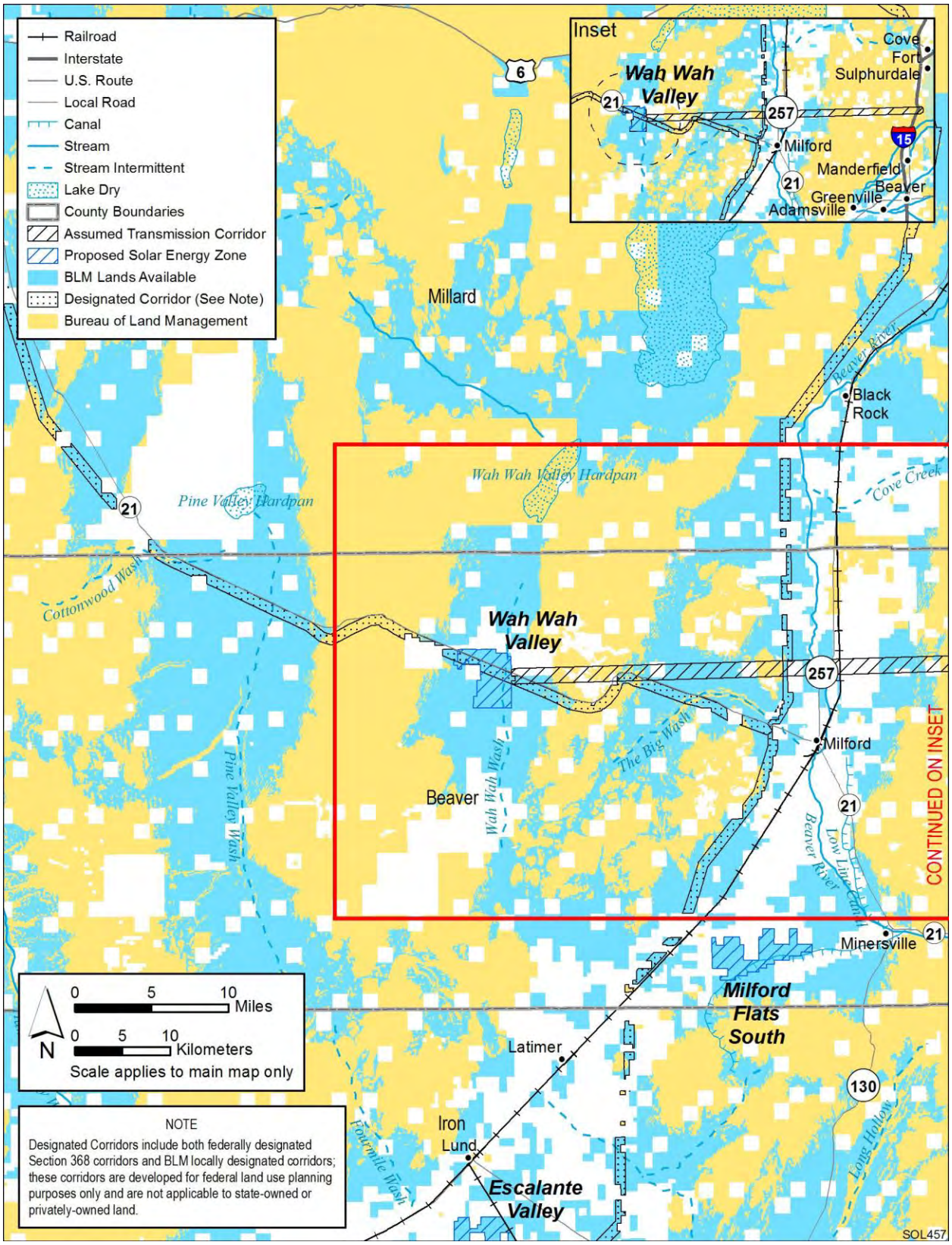

FIGURE C.6.3-1 Proposed Wah Wah Valley SEZ as Presented in the Draft Solar PEIS

- Groundwater use would deplete the aquifer to the extent that, at a minimum, wet-cooling options would not be feasible.

- Clearing of a large portion of the proposed SEZ could primarily affect semidesert shrub steppe and mixed salt desertscrub, and may adversely affect dry wash, greasewood flat, and playa habitats, depending on the amount of available habitat disturbed. The establishment of noxious weeds could result in habitat degradation. Deposition of fugitive dust could cause reduced productivity or changes in plant community structure.

- Potentially suitable habitat for 22 special status species and more than 70 wildlife species occurs in the affected area of the proposed SEZ; less than 1.0% of the potentially suitable habitat for any of these species occurs in the region that would be directly affected by development.

- If aquatic biota are present, they could be affected by the direct removal of surface water features within the construction footprint. If present, aquatic biota could also be affected by a decline in habitat quantity and quality due to water withdrawals, and changes in drainage patterns, as well as increased sediment and contaminant inputs associated with ground disturbance and construction activities. Several springs can be found in the vicinity of the proposed SEZ that also may contain aquatic biota, and they may be affected, primarily by water withdrawal.

- Temporary exceedance of ambient air quality standards for particulate matter at the SEZ boundaries and the nearest residences is possible during construction. These high concentrations, however, would be limited to the immediate area surrounding the SEZ boundary.

- Although the SEZ is in an area of low scenic quality, strong visual contrasts could be observed by residents nearest to the SEZ. Visitors to the Wah Wah Mountains WSA would experience weak to moderate visual contrasts. Travelers on State Route 21 could observe very strong levels of visual contrast associated with solar development within the SEZ.

- During construction, noise levels at the nearest residence would be well above the Iron County regulation levels and U.S. Environmental Protection Agency (EPA) guideline levels. During operations, noise levels at the nearest residence would be above both Iron County regulation levels and EPA guideline levels if concentrating solar power facilities with energy storage technologies (which could extend the daily operational time by 6 hours or more) were used at the SEZ. If dish engine facilities were developed within the SEZ, it was estimated that noise levels at the nearest residence would be higher than the Iron County regulation levels and equivalent to the EPA guideline levels.

- Few, if any, impacts on significant paleontological resources are likely to occur.

- Low-income populations occur within a 50-mi (80-km) radius of the proposed SEZ boundary; thus adverse impacts of solar development could disproportionately affect low-income populations.

C.6.3.2 Summary of Comments Received

Many comments on the proposed Wah Wah Valley SEZ were opposed to identifying the area as an SEZ in the applicable land use plan. Environmental groups cited the remoteness, lack of water, impacts on special status species, including greater sage-grouse;, the need for long, new transmission lines; and the lack of an underlying resource management plan framework as reasons that the proposed SEZ should be eliminated or deprioritized (The Wilderness Society et al.,[35] HEAL Utah, Western Watershed Project). The Wilderness Society et al. recommended that the BLM not use the Section 368 corridor as the assumed location for transmission to connect the SEZ to the grid. The Western Watersheds Project suggested that the BLM perform cultural resource surveys and consultations prior to defining the SEZ.

The National Park Service (NPS) indicated that the SEZ contains a substantial portion of the Utah prairie dog and greater-sage grouse habitat in the Utah West Desert and recommended additional analysis and mitigation measures to be provided in the Final Solar PEIS. The Beaver County Commission urged the BLM to look more closely into the impacts on grazing allotments and strongly recommended appropriate and generous mediation standards to compensate the animal unit month holder.

C.6.3.3 Changes to the SEZ

No boundary revisions were identified for the proposed SEZ. However, areas specified for non-development under SEZ-specific design features were mapped, where data were available. For the proposed Wah Wah Valley SEZ, 224 acres (0.91 km^2) of the Wah Wah Wash were identified as non-development areas (see Figure C.6.3-2). The remaining developable area within the SEZ is 5,873 acres (23.8 km^2).

C.6.3.4 Wilderness Character Status of SEZ

A recently maintained inventory of wilderness characteristics was used to determine whether public lands within the Wah Wah Valley SEZ have wilderness characteristics. The finding of this inventory was that these lands do not contain wilderness characteristics.

[35] The Wilderness Society, Wild Utah Project, Southern Utah Wilderness Alliance, Grand Canyon Trust, Center for Native Ecosystems, Sierra Club, Natural Resources Defense Council, Soda Mountain Wilderness Council, and Sierra Trek submitted joint comments on the proposed Utah SEZs. Those comments are attributed to The Wilderness Society et al.

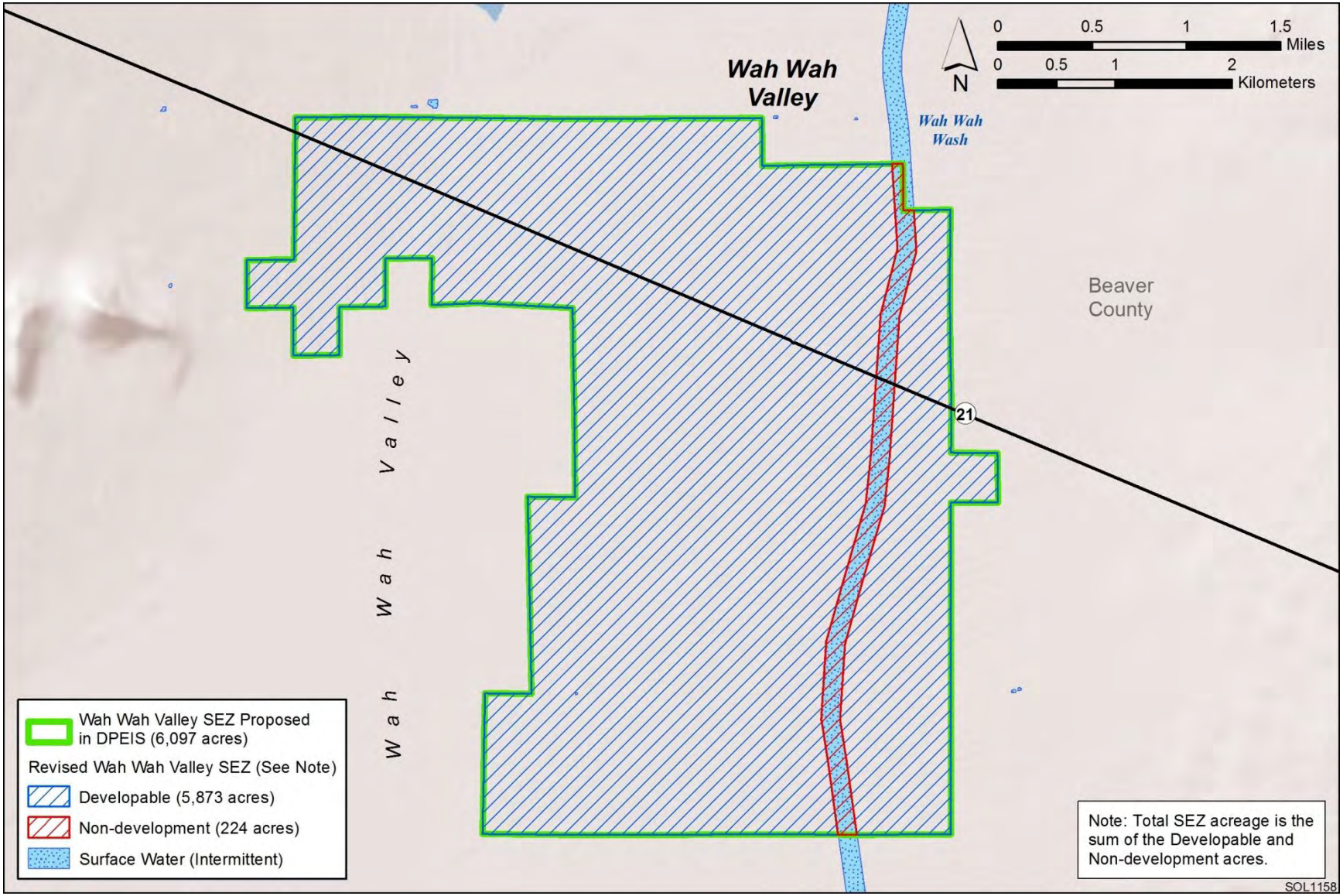

FIGURE C.6.3-2 Proposed Wah Wah Valley SEZ as Described in this Supplement

C.6.3.5 Additional Data Collection Recommended

C.6.3.5.1 Lands and Realty

None.

C.6.3.5.2 Specially Designated Areas and Lands with Wilderness Characteristics

None.

C.6.3.5.3 Rangeland Resources

Livestock Grazing. None.

Wild Horses and Burros. None.

C.6.3.5.4 Recreation

None.

C.6.3.5.5 Military and Civilian Aviation

None.

C.6.3.5.6 Geologic Setting and Soil Resources

None.

C.6.3.5.7 Minerals

Additional information on leasable and strategic minerals in the vicinity of the proposed SEZ will be provided in the Final Solar PEIS to inform the Department of the Interior's decision on a proposed 20-year withdrawal of SEZ lands.

C.6.3.5.8 Water Resources

The following additional data and actions would help further characterize potential impacts on water resources for the proposed Wah Wah Valley SEZ. A more detailed discussion of each of these activities is included in the water resources action plan provided in Section C.7.2 of this appendix.

- Prepare a planning-level water resources inventory of the Wah Wah Valley Basin.

- Identify additional dry lakes, ephemeral stream channels, and alluvial fan features for non-development areas through consultation with BLM Utah, Utah Division of Water Resources, Utah Division of Water Rights Stream Alteration Program, EPA, and U.S. Army Corps of Engineers (USACE) with a focus on:
  - Wah Wah Wash, and
  - Other ephemeral washes that cross the SEZ from south to north.

- Perform field surveys and hydrologic analyses to support jurisdictional water determinations and floodplain identifications. Tasks include:
  - Surveying Wah Wah Wash and tributaries for surface elevations, high water marks, and sediment conditions, and
  - Conducting hydrologic rainfall-runoff-routing analyses to identify 100-year floodplain areas.

- Coordinate with the USACE (Sacramento District) regarding jurisdictional water determinations for the SEZ. Water features to be considered include:
  - Wah Wah Wash, and
  - Other ephemeral washes that cross the SEZ from south to north.

- Identify 100-year floodplain non-development areas (if they exist) for Wah Wah Wash. This task would require coordination with the Federal Emergency Management Agency and the following agencies:
  - Utah Department of Public Safety, and
  - Utah Geological Survey.

- Describe the formation of a stakeholder committee to conduct long-term monitoring of water resources. This activity would entail:
  - Identifying key stakeholder agencies,
  - Discussing general features of a monitoring program, and
  - Working with the U.S. Geological Survey to develop groundwater monitoring well design and numerical groundwater models.

C.6.3.5.9 Ecological Resources

Vegetation and Plant Communities. The following additional data-gathering action would help further characterize potential impacts on wildlife resources for the Wah Wah Valley SEZ:

- Identify and map the location and areal extent of dry wash, playa, and greasewood flat habitats within the SEZ. Identify and map the location and areal extent of these habitats outside the SEZ that may be affected by hydrologic changes, including groundwater elevations, and changes in water, sediment, and contaminant inputs associated with runoff. Such efforts could help determine habitat characteristics, including water source, hydrologic regime, and dominant plant species.

Wildlife. The following additional data-gathering actions would help further characterize potential impacts on wildlife resources for the SEZ:

- Conduct pre-disturbance surveys within the SEZ to determine the use of the SEZ as a movement/migratory corridor or as important habitat for mule deer and pronghorn.

- Identify and map the location and areal extent of wash and shrubland habitat within the SEZ. These areas are important habitat for a number of wildlife species.

Aquatic Biota. Investigations recommended under the water resources action plan (Section C.6.3.5.8) would be useful in characterizing and protecting habitat available to aquatic biota. Ephemeral surface water features within the Wah Wah Valley SEZ may or may not contain aquatic biota; therefore, preliminary evaluations of these surface water features could be conducted to determine the potential for aquatic communities to be present.

Special Status Species. The following additional data-gathering actions would be useful in further characterizing and protecting habitat available to special status species.

- Conduct pre-disturbance surveys within the SEZ to determine the presence and abundance of those special status species that are (1) federally listed, proposed for listing, candidates for listing, or under review for listing under the Endangered Species Act (ESA); or (2) designated as sensitive by the Utah BLM State Office. These species are listed in Table C.6.3-1. Surveys should focus on areas identified as potentially suitable, and the suitability of these habitats to support these special status species should be determined in the field. All field-determined suitable habitats for special status species should be mapped. Target species and survey protocols should be developed in coordination with the U.S. Fish and Wildlife Service (USFWS) and Utah Department of Wildlife Resources (UDWR).

TABLE C.6.3-1 Special Status Species That May Occur in the Vicinity of the Proposed Wah Wah Valley SEZ[a]

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Plants			
Compact cat's-eye	*Cryptantha compacta*	BLM-S	Salt desert shrub and mixed shrub communities at elevations between 5,000 and 8,400 ft.[d] Known from southwestern Millard County and northwestern Beaver County, Utah, and eastern Nevada. Nearest recorded occurrence is 25 mi[e] northwest of the SEZ. About 2,866,813 acres[f] of potentially suitable habitat occurs within the SEZ region.
Frisco buckwheat	*Eriogonum soredium*	ESA-UR; BLM-S	Endemic to a small area in the San Francisco Mountains in Beaver County, Utah, on white limestone outcrops associated with pinyon-juniper communities. Elevation ranges between 6,600 and 7,300 ft. Known to occur in the San Francisco Mountains approximately 7 mi northeast of the SEZ. About 37,100 acres of potentially suitable habitat occurs within the SEZ region.
Frisco clover	*Trifolium friscanum*	ESA-UR; BLM-S	Endemic to four mountain ranges in Beaver and Millard Counties, Utah, on volcanic gravels and limestone substrates in association with pinyon-juniper woodlands at elevations between 6,900 and 7,300 ft. Nearest recorded occurrence is 8 mi northeast of the SEZ. About 1,505,400 acres of potentially suitable habitat occurs within the SEZ region.
Jone's globemallow	*Sphaeralcea caespitosa*	BLM-S	Known from at least four occurrences in western Utah and six occurrences in eastern Nevada on federal and state lands on dolomite calcareous soils in association with mixed shrub, pinyon-juniper, and grassland communities at elevations between 5,000 and 6,500 ft. Nearest recorded occurrence is 7 mi west of the SEZ. About 4,471,200 acres of potentially suitable habitat occurs within the SEZ region.
Long-calyx milkvetch	*Astragalus oophorus lonchocalyx*	BLM-S	Endemic to the Great Basin in western Utah and eastern Nevada in pinyon-juniper woodlands, sagebrush, and mixed shrub communities at elevations between 5,800 and 7,500 ft. Nearest recorded occurrence is 12 mi northeast of the SEZ. About 4,351,100 acres of potentially suitable habitat occurs within the SEZ region.
Money wild buckwheat	*Eriogonum nummulare*	BLM-S	Western Utah and eastern Nevada on gravelly washes, flats, and slopes in saltbush and sagebrush communities and pinyon-juniper woodlands. Nearest recorded occurrence is 20 mi north of the SEZ. About 3,760,200 acres of potentially suitable habitat occurs within the SEZ region.
Ostler's ivesia	*Ivesia shockleyi ostleri*	BLM-S	Endemic to the Wah Wah Mountains and Needle Range of western Beaver County, Utah, in pinyon-juniper and ponderosa pine forests in crevices of quartzite outcrops at elevations between 6,500 and 8,000 ft. Nearest recorded occurrence is 15 mi southwest of the SEZ. About 1,507,100 acres of potentially suitable habitat occurs within the SEZ region.
Ostler's pepper-grass	*Lepidium ostleri*	ESA-UR; BLM-S	Endemic to a small area in the San Francisco Mountains in Beaver County, Utah, on limestone outcrops within pinyon-juniper communities at elevations between 5,800 and 6,800 ft. Nearest recorded occurrence is within 7 mi northeast of the SEZ.

TABLE C.6.3-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Birds			
Bald eagle[g]	***Haliaeetus leucocephalus***	BLM-S	A winter resident throughout the SEZ region, most commonly along large bodies of water where fish and waterfowl prey are available. Wintering areas are associated with open water. May occasionally forage in arid shrubland habitats. Quad-level occurrences intersect the SEZ and other portions of the affected area. About 2,666,800 acres of potentially suitable habitat occurs within the SEZ region.
Ferruginous hawk	***Buteo regalis***	BLM-S	A year-round resident in the SEZ region. Grasslands, shrublands, agricultural lands, and the periphery of pinyon-juniper forests throughout the SEZ region. Nests are generally constructed in trees and exposed rock outcrops along cliffs, buttes, and creek banks. Quad-level occurrences intersect the SEZ and other portions of the affected area. About 1,749,900 acres of potentially suitable habitat occurs within the SEZ region.
Greater sage-grouse	***Centrocercus urophasianus***	ESA-C; BLM-S	A year-round resident in the SEZ region. Plains, foothills, and mountain valleys dominated by sagebrush throughout the SEZ region. Lek sites are located in relatively open areas surrounded by sagebrush or in areas where sagebrush density is low. Nesting usually occurs on the ground where sagebrush density is higher. Quad-level occurrences intersect the affected area south of the SEZ. Crucial brooding habitat for the species exists about 22 mi east of the SEZ and intersects the transmission corridor. About 1,608,000 acres of potentially suitable habitat occurs within the SEZ region.
Long-billed curlew	***Numenius americanus***	BLM-S	Summer resident and migrant throughout the SEZ region in short-grass grasslands near standing water. Species is likely to be transient only in the vicinity of the SEZ. Quad-level occurrences intersect the affected area within the transmission corridor approximately 20 mi east of the SEZ. About 331,700 acres of potentially suitable habitat occurs within the SEZ region.
Northern goshawk	***Accipiter gentilis***	BLM-S	A year-round resident in the SEZ region. Mature mountain forest and riparian zone habitats throughout the SEZ region. Nests in trees in mature deciduous, coniferous, and mixed forests. Forages in both heavily forested and relatively open shrubland habitats. Quad-level occurrences intersect the affected area north of the SEZ. About 245,300 acres of potentially suitable habitat occurs within the SEZ region.
Short-eared owl	***Asio flammeus***	BLM-S	Year-round resident within the SEZ region. Inhabits grasslands, shrublands, and other open habitats throughout the SEZ region. Nomadic, often selecting unique breeding sites each year, depending on local rodent densities. Nests on the ground near shrubs. Quad-level occurrences intersect the affected area east and west of the SEZ. About 4,138,850 acres of potentially suitable habitat occurs within the SEZ region.
Western burrowing owl	***Athene cunicularia hypugaea***	BLM-S	A year-round resident in the SEZ region. Open grasslands and prairies, as well as disturbed sites such as golf courses, cemeteries, and airports throughout the SEZ region. Nests in burrows constructed by mammals (prairie dog, badger, etc.). Quad-level occurrences intersect the SEZ and other portions of the affected area. About 3,037,300 acres of potentially suitable habitat occurs within the SEZ region.

TABLE C.6.3-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]
Mammals			
Dark kangaroo mouse	***Microdiposops megacephalus***	BLM-S	Sagebrush-dominated areas with sandy soils in Great Basin region. Nocturnally active during warm weather, the species remains in underground burrows during the day and cold winter months. Quad-level occurrences intersect the SEZ and other portions of the affected area. About 1,060,500 acres of potentially suitable habitat occurs within the SEZ region.
Fringed myotis	***Myotis thysanodes***	BLM-S	Wide range of habitats, including lowland riparian, desert shrub, pinyon-juniper, and sagebrush habitats. Roost sites have been reported in buildings and caves. Quad-level occurrences intersect the affected area within the transmission corridor approximately 40 mi east of the SEZ. About 4,433,300 acres of potentially suitable habitat occurs within the SEZ region.
Kit fox	***Vulpes macrotis***	BLM-S	Open prairie, plains, and desert habitats where it inhabits burrows and preys on rodents, rabbits, hares, and small birds. Quad-level occurrences intersect the SEZ and other portions of the affected area. About 2,641,200 acres of potentially suitable habitat occurs within the SEZ region.
Pygmy rabbit	***Brachylagus idahoensis***	BLM-S	Sagebrush-shrubland habitats throughout the SEZ region. Prefers loose soils to dig burrows. Quad-level occurrences intersect the affected area within the transmission corridor approximately 10 mi east of the SEZ. About 930,850 acres of potentially suitable habitat occurs within the SEZ region.
Spotted bat	***Euderma maculatum***	BLM-S	Near forests and shrubland habitats throughout the SEZ region. Uses caves and rock crevices for day roosting and winter hibernation. Quad-level occurrences intersect the affected area within the transmission corridor approximately 10 mi east of the SEZ. About 3,404,900 acres of potentially suitable habitat occurs within the SEZ region.
Townsend's big-eared bat	***Corynorhinus townsendii***	BLM-S	Near forests and shrubland habitats below 9,000-ft elevation throughout the SEZ region. The species may use caves, mines, and buildings for day roosting and winter hibernation. Quad-level occurrences intersect the affected area east of the SEZ. About 3,283,500 acres of potentially suitable habitat occurs within the SEZ region.
Utah prairie dog	*Cynomys parvidens*	ESA-T	Endemic to southwestern Utah in grasslands in level mountain valleys and areas with deep, well-drained soils. Colonies reside in underground burrow systems, which are dynamic in size and location. Nearest quad-level occurrences are 20 mi south of the SEZ; colonies are known to occur outside of the affected area within 18 mi south of the SEZ. About 641,400 acres of potentially suitable habitat occurs within the SEZ region.

[a] The listings for (1) federally listed, proposed for listing, or candidates for listing under the ESA, and (2) Utah BLM State Office sensitive species have been updated since the release of the Draft Solar PEIS.

[b] BLM-S = listed as a sensitive species by the BLM; ESA-C = candidate for listing under the ESA; ESA-T = listed as threatened under the ESA; ESA-UR = under review for listing under the ESA.

Footnotes continued on next page.

TABLE C.6.3-1 (Cont.)

[c] For plant species, potentially suitable habitat was determined by using Southwest Regional Gap Analysis Project (*S*WReGAP) land cover types (USGS 2005). For terrestrial vertebrate species, potentially suitable habitat was determined by using SWReGAP habitat suitability and land cover models. Area of potentially suitable habitat for each species is presented for the SEZ region, which is defined as the area within 50 mi (80 km) of the SEZ center.

[d] To convert ft to m, multiply by 0.3048.

[e] To convert mi to km, multiply by 1.609.

[f] To convert acres to km^2, multiply by 0.004047.

[g] Species in bold text have been recorded or have designated critical habitat in the affected area.

The Draft Solar PEIS presents a table of special status species for which potential impacts need to be evaluated prior to development in the proposed Wah Wah Valley SEZ. The list of species presented in Table 13.3.12.1-1 of the Draft also includes species listed by the State of Utah and species ranked by the State of Utah as S1 or S2 or as species of concern. On the basis of design features presented in the Draft Solar PEIS, the potential for impacts on these additional species will also need to be addressed before development could occur in the SEZ.

- Identify and map the location and areal extent of rocky cliffs and outcrops within the SEZ. The suitability of these habitats for special status species should be determined. Species potentially associated with these habitats include Frisco buckwheat, Ostler's pepper-grass, ferruginous hawk (nesting), fringed myotis (roosting), spotted bat (roosting), and Townsend's big-eared bat (roosting).

- Identify and map the location and areal extent of woodland habitats within the SEZ. Woodland habitats that may occur in the area of direct effects include pinyon-juniper and oak/mahogany woodlands. The suitability of these woodland habitats for special status species should be determined. Species potentially associated with these habitats include Frisco clover, Ostler's ivesia, ferruginous hawk (nesting), and northern goshawk (nesting).

C.6.3.5.10 Air Quality and Climate

None.

C.6.3.5.11 Visual Resources

A summary of the Draft Solar PEIS visual contrast analysis for the Wah Wah Valley SEZ is provided in Table C.6.3-2. This table includes only the resources that would be subject to

TABLE C.6.3-2 Summary of Potential Visual Impacts on SVRAs and SVLs within the 25-mi (40-km) Viewshed of the Proposed Wah Wah Valley SEZ

Management Area Category	SVRA/SVL within 25 mi[a] of SEZ	Total Acreage/ Mileage[a,b,c] of SVRA/SVL	Distance from SEZ at Point of Closest Approach[d]	Total Acreage/Mileage Visible within 25 mi	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes
WSA	Wah Wah Mountains	49,406 acres	5 mi northwest of the SEZ	3,777 acres	7.6	Potential visual contrast expected would be highly dependent on viewer locations, as well as on the numbers, types, sizes, and locations of solar facilities and other project- and site-specific factors. Solar facilities would be expected to create weak to moderate visual contrasts; the highest levels of visual contrast would be expected for viewing locations at higher elevations in the far southern portion of the WSA, with less visibility and lower contrast levels expected at the more distant locations in the SEZ viewshed farther north and at lower elevations: The visible area of the WSA extends from the point of closest approach to approximately 10.3 mi.

TABLE C.6.3-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi[a] of SEZ	Total Acreage/ Mileage[a,b,c] of SVRA/SVL	Distance from SEZ at Point of Closest Approach[d]	Total Acreage/Mileage Visible within 25 mi	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes
Other Areas of Interest (non-management areas)	State Route 21[e]	107 mi	3.8 mi of the route passes through the northern half of the SEZ from east-southeast to west-northwest	16 mi	15.0	Very strong visual contrasts could be observed within and near the SEZ by travelers as they approached and passed through the SEZ on State Route 21. Contrast levels would gradually rise, and strong levels of visual contrast would be expected. Travelers would have a brief exposure of the proposed solar facilities.

[a] To convert mi to km, multiply by 1.609.

[b] To convert acres to km^2, multiply by 0.004047.

[c] Mileage (within all columns) is used only for trails or roads, unless otherwise specified.

[d] Distances are based on the Draft Solar PEIS analysis dated December 2010; any alterations to the SEZ boundaries may result in changes to the distance at the point of closest approach.

[e] Length of State Route 21: Utah DOT (2008).

moderate or strong visual contrast. The Draft Solar PEIS visual impact analysis predicted these levels of visual contrast from solar energy development in the Wah Wah Valley SEZ for the following sensitive visual resource areas (SVRAs) and sensitive viewing locations (SVLs):

- Wah Wah Mountains Wilderness Study Area (WSA)
- State Route 21.

A very small portion of the King Top WSA is within the viewshed of the SEZ, but it is too far away for strong visual contrasts to be noted from solar development within the SEZ. The closest community is more than 25 mi (40 km) from the SEZ, and, therefore is likely to have minimal to no visual contrast within the landscape resulting from solar development within the SEZ.

The following steps could be taken to better understand potential impacts on these SVRAs and SVLs from solar development in the Wah Wah Valley SEZ:

- Identify key observation points (KOPs) within these areas through working with the management agency or other local stakeholders.
- Conduct viewshed analyses from the KOPs to determine how much of the SEZ would be in view from each KOP.
- As deemed necessary, based on viewshed analysis results, prepare wireframe Google Earth™ visualizations of hypothetical solar facilities in the SEZ depicting the 80% development scenario to better estimate potential impacts.

This additional analysis may help to judge potential visual contrast more accurately for most KOPs. For KOPs of particularly high sensitivity, a site visit with photography and superimposition of the wireframe models onto the photos might be required or desired.

C.6.3.5.12 Acoustic Environment

None.

C.6.3.5.13 Paleontological Resources

The Wah Wah Valley SEZ is located in an area where the Potential Fossil Yield Classification (PFYC) of the SEZ has been determined to be Class 2. Therefore, the potential for impacts on paleontological resources is low. No additional data collection is needed at this time, although verification of this classification is recommended at a project-specific level.

C.6.3.5.14 Cultural Resources and Native American Concerns

Less than 1% of the proposed Wah Wah Valley SEZ has been surveyed (approximately 11 acres [0.04 km^2][36]). One site has been recorded in the SEZ, and only four sites have been recorded within 5 mi (8 km) of the SEZ. The low density of sites recorded in basin interiors in this region suggests the potential for significant sites within the SEZ is low (Dalley 2009). One potential cultural resource of interest that runs through the SEZ is a former power line that ran from Milford to the Rocky Mountain Research Station Desert Experimental Range; the line was noted in an initial site visit of the SEZ but has not been formally recorded. The destruction or degradation of important plant resources and the destruction of habitat or impediments to the movement of culturally important wildlife are also potential impacts of concern within the SEZ.

The following additional data collection efforts could reduce the uncertainty about potential impacts:

- Conduct a Class I literature file search to better understand (1) the site distribution pattern in the vicinity of the SEZ, (2) trail networks through existing ethnographic reports, (3) overall cultural sensitivity of the landscape, and (4) the historical background of the former power line and associated research station.

- Conduct a Class II Stratified Random Sample Survey of SEZ to obtain a 10% sample (roughly 610 acres [2.5 km^2]). Areas of interest, as determined through a Class I review, should also be identified prior to establishing the survey design and sampling strategy.

- Prepare a cultural sensitivity map based on results of the Class II survey and Class I review.

- Continue with government-to- government consultation as described in Section 2.4.3, including follow-up to recent ethnographic studies with Tribes not included in the original studies to determine whether those Tribes have similar concerns, or if they would want to participate in a similar ethnographic study (the Pahrump Paiute have indicated they would like to be included). The Wah Wah Valley SEZ falls in the traditional use area of primarily the Southern Paiute, but also the Western Shoshone and Ute. Potential topics to be discussed during consultation include the Wah Wah Springs, Lake Sevier, Lake Bonneville, Wallace's Peak, the Wasatch Mountains, trail systems, mountain springs, habitation sites as places of cultural importance, clay and rock resources, burial sites, rock art, ceremonial areas, and plant and animal resources. The agencies value the information shared by the Tribes during the ethnographic study and will consider their input in striving to minimize the impacts of solar development in the SEZ. The completed ethnographic

[36] New information not provided in the Draft Solar PEIS.

study will be available in its entirety on the Solar PEIS Web site (http://solareis.anl.gov). A summary of the contents of that report is also provided in the following text box.

Wah Wah Valley SEZ Study Area Summary

The Wah Wah Valley SEZ study area and its surrounding landscape were traditionally occupied and used, aboriginality owned, and historically related to the Numic-speaking peoples of the Great Basin and western Colorado Plateau. The field consultations summarized here are from members of the Paiute Indian Tribe of Utah and members of the Confederated Tribes of the Goshute Reservation. These Numic-speaking peoples have stated on record in past projects and stipulate here again, that they are the American Indian people responsible for the cultural resources in this SEZ study area because their ancestors were placed here by the Creator. They have continued to live in these lands, maintaining and protecting these places, associated natural resources, and cultural signs of their occupation.

These Numic-speaking peoples further stipulate that because they have lived in these lands since the end of the Pleistocene and throughout the Holocene; they deeply understand the dramatic shifts in climate and ecology that have occurred over these millennia. Indian lifeways were dramatically influenced by these natural shifts, but certain religious and ceremonial practices continued unchanged. These traditional ecological understandings are carried from generation to generation through the recounting of origin stories and by strict cultural and natural resource conservation rules. The involved American Indian Tribal governments and their appointed representatives have participated in this PEIS in order to explain the meaning and cultural centrality of the natural and culture resources that exist in these lands.

During the ethnographic field sessions, Tribal representatives identified the Wah Wah Valley SEZ study area as being part of a large ceremonial landscape that contains many traditional use features such as the Wah Wah Springs, volcanic places, and important plants and animals, as detailed below:

- Sources for water—Wah Wah Springs, Lake Sevier, and Lake Bonneville
- Evidence of previous Indian use—extensive Indian ricegrass (waii) field remnants of farming and lithics at Wah Wah Springs
- Sources for plants—ceremonial, medicinal, and utilitarian plants, food staples (waii)
- Sources for animals—birds of prey, game birds, migratory birds, predatory and game mammals, small mammals, lizards, snakes, spiritual animals, and pronghorn antelope
- Geologic features—Wah Wah Mountains and Wallace's Peak used for vision questing
- Indian history—Lake Sevier farming, travelers along the Old Spanish Trail 1829–1849, Mormon expansion 1850s, cattle and sheep ranching 1870s, mining and boom towns 1871–1910, railroads 1880.

Tribal representatives noted that the Wah Wah Valley SEZ study area has always been a part of the greater Lake Sevier region. Lake Sevier (located about 20 mi [32 km] northeast of the SEZ) receives most of its replenishing water today from Sevier River. The river begins in a meadow high in the Wasatch Mountains. The Sevier River flows from its headwaters and then drains into Lake Sevier. For thousands of years, Lake Sevier also was filled with water from the south that largely emanated from the high mountain ranges that topographically define Wah Wah Valley.

Tribal representatives identified the Wah Wah Springs Complex (located 2 mi [3 km] west of the SEZ) as an important water source in the SEZ study area. Their importance has increased with the depletion of Lake Sevier and the Wah Wah Valley Playa. Because of this, the springs are currently the primary water sources in the valley. These springs are seen as both a culturally important life force and a spiritual place.

Wah Wah Valley SEZ Study Area Summary (Cont.)

Since the end of the Pleistocene, Indian people have lived and thrived in the abundant lake, river, and riparian habitats of the Wah Wah Valley SEZ study area. Prior to the arrival of Euro-Americans, the area was a shared borderland between Southern Paiutes and Goshutes. Southern Paiutes and Goshutes shared farming areas and social relations along both sides of the Sevier River.

Indian people noted that the SEZ study area contains a wide variety of traditional use plants. In the mountains, areas were identified as rich pine nut harvesting areas. The lowland areas contained expansive fields of Indian ricegrass (*Achnatherum hymenoides*), also known as *waii*, which is a culturally central food. The term field is used by Indian representatives to indicate that they perceive these types of plants like traditional crops, in that Indian people actively managed and cared for these wild resources.

The abundant plant communities in the Wah Wah Valley SEZ study area support extensive herds of antelope, which were the focus of large-scale communal hunts that involved different Indian communities. Antelope shamans were important in these organized hunts because they were specialized in spiritually and physically interacting with the antelope to draw upon the antelope's Puha (power or energy) and to select ones for the communal hunts. The purpose of these interactions was to assure that the animals were treated with respect and protected.

Volcanic places, such as Wallace's Peak (located about 2.5 mi [4 km] west of the SEZ), are considered sacred locations used for vision questing and power acquisition. Numic-speaking people believe that volcanic events are moments when Puha deep inside the Earth is brought to the surface as a way for the land to renew itself as it moves across the landscape. Underground, Puha follows the flow of magma and distributes itself and connects volcanic places over vast distances.

Indian people continued to use these areas in traditional ways until Euro-Americans began settling along the front range of the Wasatch Mountains in about the mid-1800s. Soon the Indian irrigated farms along the Sevier River were lost, and eventually most major water sources would be taken by the non-Indian settlers. The encroachment period continued until the late 1800s when most aspects of traditional life were impossible to sustain. At this time, Indian people shifted to wage labor. They worked in many of the region's mines, built and operated the railroads, and were ranch laborers. This shift is positively discussed and remembered today with a cultural interest in how previous generations adapted to new social, economic, and ecological conditions. The celebration of survival is offset by the sadness of having a well-adapted independent traditional lifeway replaced by wage labor in resource extraction activities.

C.6.3.5.15 Socioeconomics and Environmental Justice

None.

C.6.3.5.16 Cumulative Impact Considerations

None.

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C.7 GENERAL ADDITIONAL ANALYSIS REQUIREMENTS FOR SEZS

C.7.1 Revised Transmission Analysis

C.7.1.1 General Information

The Draft Solar Programmatic Environmental Impact Statement (Solar PEIS) included a generic analysis of the environmental impacts of construction and operation of transmission lines and substations (Section 5 of the Draft Solar PEIS); proposed design features to reduce or eliminate impacts (Appendix A of the Draft Solar PEIS); a transmission constraints analysis to determine whether additional corridor designation on U.S. Department of the Interior Bureau of Land Management (BLM) lands would be needed to facilitate solar development (Appendix G of the Draft Solar PEIS); and an analysis of the impacts of constructing transmission from the individual proposed solar energy zones (SEZs) to the nearest existing transmission line based on the assumption that existing lines could be upgraded (contained in individual SEZ sections in Chapters 8 through 13 of the Draft Solar PEIS).

Commentors, including the U.S. Environmental Protection Agency, disagreed with the simplifying assumptions used for the SEZs and stated that impacts from transmission were likely to be substantially greater than those portrayed in the Draft Solar PEIS. Comments from industry and environmental organizations noted that BLM policies should address cooperative development, sharing of generation tie-lines, and transmission incentives that could facilitate development within SEZs, and should be integrated with ongoing regional and state-level transmission planning efforts. Some commentors also asked for a much more comprehensive transmission analysis such as available capacity, costs associated with building or upgrading infrastructure, and timing of new transmission.

Although the lead agencies (BLM and DOE) recognize that there are limitations in terms of the accuracy of predicting whether new transmission will be needed to support development within the proposed SEZs and where and when it will be built, they propose to conduct additional analysis of transmission needs for inclusion in the Final Solar PEIS for those SEZs being carried forward in the analysis (see Sections C.1 through C.6). This analysis is intended to provide additional information to the agencies and their stakeholders regarding the nature of transmission access issues associated with proposed SEZs and the extent of new transmission development that might be needed to support solar energy generation within the SEZs. Section C.7.1.2 of this appendix discusses the factors that can limit accurate prediction of transmission needs for the SEZs. Section C.7.1.3 presents the proposed methods to be used for additional SEZ-specific transmission analysis for the Final Solar PEIS. Section C.7.1.4 presents a test case analysis for the proposed Brenda SEZ to demonstrate the types of additional information that would be included in the Final Solar PEIS.

C.7.1.2 Factors Limiting Predictability of Future Transmission Needs for the SEZs Assessed in the Solar PEIS

Due largely to federal government deregulation of the utility industry and the greater roles regional transmission organizations (RTOs) and independent system operators (ISOs) play in apportioning transmission capacity, there has been great uncertainty in the power generation industry about how to finance new transmission infrastructure. It became unclear what benefits a utility would derive from bankrolling transmission system upgrades, or how they would be repaid for their investment. Consequently, there has been little investment in transmission over the past 20 years. This situation has very slowly been resolved, with utilities increasingly gaining the confidence to make investments in infrastructure.

Renewable energy developers, both wind and solar, have shown a strong preference to locating their generation projects near existing transmission lines, especially lines with existing capacity, and preferably very near an existing substation on a line with capacity. This strategy minimizes the cost of connecting their projects to the transmission grid and avoids the need to finance transmission system upgrades to create the needed capacity. However, this is not an option for transmission projects in the SEZs that are not located near existing transmission lines or near lines with existing capacity. The proposed additional transmission analysis that will be conducted for SEZs, which is described in Section C.7.1.3, will assess the available capacity on existing transmission lines near the proposed SEZs and estimate the costs and impacts of upgrading existing lines and/or constructing completely new lines.

On the basis of approved solar projects to date, establishing transmission (either through use and/or upgrade of existing lines or construction of new lines) generally precedes solar development projects. Solar developers likely need to have signed Power Purchase Agreements (PPAs) and a demonstrated ability to reach the potential purchasers in order to acquire financing. However, arranging for the new and/or upgraded transmission line capacity needed and financing it is an area in which solar developers may not be knowledgeable. If transmission planning is not adequately factored into project planning, solar projects may be greatly delayed or become infeasible.

The following factors limit the ability to identify specific transmission construction needs to allow solar development in the proposed SEZs, and should be considered when interpreting the results of the proposed transmission impact assessment (detailed further in Sections C.7.1.2 and C.7.1.3):

- Available transmission capacity in the six-state study area is limited. It is likely that much of the solar generation produced in SEZs would need new or upgraded transmission lines to move power to market. Determining exactly where new transmission lines would be located is problematic, as discussed below.

- By law, requests for capacity on the transmission system are analyzed on a first-come, first-serve basis. The applicant who first encounters a shortage of capacity to meet the planned project's needs must finance whatever system

upgrades are necessary in order to create the additional capacity needed. Utilities maintain queues to keep track of who applied first; thus there is incentive to make a request regardless of how viable a project might be. Therefore, most utility queues include a number of unlikely projects, and there is no easy way to separate out the truly viable projects from the placeholders. The queues are thus a poor source of information about what projects might be built and when.

- Some transmission projects are viewed as proprietary information by their proponents for several reasons, including but certainly not limited to concerns about competition for favorable rights-of-way (ROWs) or routes, cost or funding considerations, or a desire to preserve a competitive advantage. If such projects are not publicly known, that information cannot be used to help efficiently plan transmission for the SEZs.

- The order in which projects proceed, and their relative timing, can have a large impact on how the transmission system develops. A simple example would be solar project development in a given SEZ. If many solar generation projects were developed at the same time or close in time, it is reasonable to assume that one or a few large transmission lines would be constructed to carry the generation to market. If the same projects were developed singly over a longer period of time, then one would predict that several smaller transmission lines could result, since there is generally no financing available for overbuilding a transmission line for potential (and uncertain) future projects. In the proposed method for assessing new transmission needs for SEZs, it has been assumed that all the SEZs would be built out to capacity over a relatively short time period of 5 to 10 years, because available data on the transmission system do not extend past the year 2020 (see Section C.7.1.3). However, it should be noted that larger lines are more expensive, and if SEZs are not built out to capacity over the next 10 years or so, construction of smaller transmission lines or upgrades of existing lines may be more likely.

- The same list of projects will result in far different transmission development depending on which project gets under way first. The first project may partially negate the need for follow-on projects, or divert some customers. Competing projects may continue up to the time that one goes forward: at that time, the second project may be discontinued or may be combined with the first project. The corresponding need for power flow on the transmission system would also change, depending on the generation level of the first project and where it would interconnect to the power system. This could cause other proposed projects to become nonviable because of capacity changes on the system. With all of the placeholder projects in utility queues and the multitude of reasons project schedules either lag or accelerate, it is extremely difficult to predict the capacity of new transmission development and where and when it will occur.

- Solar developers will need to market the output of their projects to potential purchasers. The PPAs would generally need to be in place in order to determine to which load areas (i.e., population centers that could accommodate the solar-generated electricity) the power would be transported. The proposed SEZ-specific transmission analyses to be included in the Final Solar PEIS may help developers initially identify the most likely load areas for each SEZ and begin PPA negotiations with appropriate power companies.

- Several extremely long transmission line projects are proposed in the six-state study area. Routing of these lines may or may not take into consideration the locations of the proposed SEZs, and new transmission lines may be located without regard for where the SEZs are located, as developers will want to minimize the costs of constructing new or upgraded transmission systems. However, such projects may be constructed within designated transmission corridors, particularly corridors designated under Section 368 of the Energy Policy Act of 2005,[37] because designated corridors have been through initial environmental review to minimize siting issues. Many of the proposed SEZs are located near Section 368 corridors. In addition, under the BLM's preferred alternative, applications for solar projects in variance areas outside of SEZs may be accepted, thus allowing some projects outside of SEZs to take advantage of new transmission that may become available over the 20-year study period.

C.7.1.3 Proposed Methodology for SEZ-Specific Transmission Analyses for the Final Solar PEIS

To better quantify potential upper bound and mid-range impacts of bringing transmission to the SEZs being carried forward for the Final Solar PEIS, a revised transmission analysis is proposed. The overall scope and approach for this additional analysis has been guided by review comments and programmatic oversight by the BLM, DOE, National Renewable Energy Laboratory (NREL), Western Area Power Administration, and the Western Electricity Coordinating Council (WECC), with a goal of developing reasonable estimates for transmission requirements and impacts, while recognizing that full-scale engineering analyses are beyond the scope of the Solar PEIS effort. The information generated by this analysis would include:

1. Identification and characterization of potential load areas to be served by the SEZ under consideration.

[37] Section 368 of the Energy Policy Act of 2005 (Public Law 109-58) required federal agencies to engage in transmission corridor planning (see Section 1.6.2.1 of the Draft Solar PEIS). As a result of this mandate, the BLM, DOE, U.S. Forest Service (USFS), and U.S. Department of Defense prepared a PEIS to evaluate the designation of energy corridors on federal lands in 11 western states, including the 6 states evaluated in this study (DOE and DOI 2008). The BLM and USFS issued Records of Decision to amend their respective land use plans to designate numerous corridors, often referred to as Section 368 corridors.

2. Characterization of transmission options for delivering power from the SEZ to the potential load areas under both an upper bound analysis and a mid-range analysis, and an estimation of the associated requirements in terms of transmission line length, number of substations, total land use requirement, voltage levels, wire sizes, and bundling configurations.

3. Identification of favorable and less-favorable transmission configurations in terms of potential impacts, including land use requirements and cost.

To identify the potential load areas to be served by SEZs, a simple mathematical algorithm will be applied to identify which load areas would be the most favorable in terms of load requirements and distance from specific SEZs (see Section C.7.1.3.1 for a detailed description of the methodology for load area identification). Because of the variable nature of solar generation, the identified load areas will need to represent significantly greater load than is expected to be delivered from a given SEZ (because no load area would depend entirely on solar generation to meet its peak loads).

Using the information on potential load centers for an SEZ, an upper bound assessment of transmission impacts for the SEZs will be conducted, assuming that new transmission lines will be needed for all SEZ-generated electricity (this will be termed the ~~"~~dedicated-line transmission" analysis, or DLT analysis). The estimated generation capacity of SEZs will be conservatively based on an assumed full build-out of each SEZ (i.e., 80% of acreage developed) to be delivered to one or more load areas. It is projected that one to four favorable load areas for each SEZ will be identified.

In addition to the upper bound analysis, an additional mid-range analysis will be conducted for some of the SEZs being carried forward to provide a semi-quantitative analysis of transmission needs using information about available capacity on existing lines and proposed new lines as the basis for impact estimates (this will be termed the shared-line transmission analysis, or SLT analysis). The SLT analysis will be conducted for all proposed SEZs in Arizona, California, and Nevada that are being carried forward in the Final Solar PEIS (see Sections C.1 through C.6). These analyses will support responses to specific comments about opportunities to use existing and proposed new lines that were received on the Draft Solar PEIS.

- Specifically, the upper bound DLT analysis will estimate the number and size of additional lines and substations required to move SEZ-generated electricity to load center(s) in order to estimate the acres of land that would be disturbed. The mid-range SLT analysis will estimate the number of line upgrades, new transmission lines, and substations needed, assuming tie-in to the existing grid where data indicate this would be likely. For both analyses, in order to calculate the number of miles of new transmission construction and acres disturbed, it will be assumed that new transmission construction will occur parallel to existing ROWs and/or within or along designated corridors.

- The revised transmission analysis will also identify the transmission stakeholders (e.g., regulators, planning groups, and councils) and transmission

planning process for each SEZ, and outline coordination policies that DOE and the BLM may adopt to help bring transmission to SEZs. It will acknowledge the requirements contained in the Memorandum of Understanding regarding coordination in federal agency review of transmission facilities on federal land (USDA et al. 2009).

- Transmission considerations will be an early and integral component of the BLM's SEZ identification protocol (see Appendix D of this Supplement), focusing on near-term transmission projects and coordination with transmission analytical and planning efforts ongoing through other organizations. Examples of such efforts include those being carried out by WECC's Transmission Expansion Planning Policy Committee (TEPPC), WECC's Technical Studies Subcommittee, the Western Governors' Association State/Provincial Steering Committee transmission planning groups, regional and subregional planning groups, utility-level planning initiatives, and investigations by many other stakeholders.

C.7.1.3.1 Methodology for Identifying Likely Load Areas

The methodology for identifying likely load centers is designed to provide a logical foundation and reproducible basis for associating SEZs with appropriate load areas. The goal is to develop SEZ/Load-Area assignments for each SEZ. This task represents the first step in an enhanced assessment of transmission requirements for SEZs. The SEZ/Load-Area assignments will provide the basis for examining the transmission needs and impacts for all SEZs, including those that can potentially take advantage of nearby transmission lines and/or substations with available capacity, those existing lines that could be upgraded to carry more capacity, and those that are likely to require new transmission capabilities.

Background. The approach is designed to provide realistic approximations but should not be interpreted as predictive or definitive, in part, because the transmission development process is complex and dynamic, and also because of limitations in scope. Many commercial entities (utilities, independent transmission developers, etc.), public entities, and governmental entities are involved in planning, financing, permitting, and constructing new transmission lines, and this analysis is not intended to capture those multi-entity dynamics. Likewise, this analysis does not represent a technically rigorous treatment of the load associations, as it does not employ load flow analysis or optimization techniques that are used by industry to simulate grid flows and optimize cost/pricing issues. Such rigorous analysis requires extensive modeling that is beyond the scope of the Solar PEIS. Instead, the logic outlined in this algorithm represents an effort to capture some of the important physical factors that determine logical load areas for prospective generation sources. By including considerations for the factors discussed below, the algorithm described is intended to produce realistic assessments of transmission requirements and associated impacts. This information may provide insight and data for supplying study requests to WECC for additional analysis by WECC's TEPPC Regional Transmission Expansion Planning 10-year planning process, and for WECC's Technical Studies Subcommittee reliability

studies. In addition, this information may be used to augment the Western Renewable Energy Zone initiative.

Basic Considerations and Overview. The following objectives and factors are incorporated into the SEZ/Load-Area algorithm:

- Minimizing distances between each SEZ generation source and selected load(s);
- Identifying existing transmission lines where available capacity may exist;
- Taking advantage of existing ROWs or planned corridors, even where little or no excess capacity exists, and recognizing existing grid topology as it might lead to shorter transmission distances (to provide a realistic estimate of the routes that would likely be followed in constructing new transmission lines or upgrading existing lines);
- Identifying adequate loads to absorb planned SEZ generating capacities;
- Limiting solar-generated assignments for any given load area to a reasonable percentage of the total load for that area; and
- Allowing SEZs to serve out-of-state load areas.

These factors will be integrated into the algorithm for identifying load areas for each SEZ. Collectively, they are intended to mimic some of the basic considerations that drive transmission development, without requiring the rigor of detailed load flow analysis. These items are discussed in greater detail in the following descriptions.

Minimizing Distances between Generation Source and Designated Load(s). Distance minimization recognizes that transmission distance is one of the strongest factors affecting transmission costs and line losses. Minimizing distance represents a fundamental objective in most transmission planning efforts, although in some cases a power generator can afford to move power greater distances if the sales price in the more-distant market is higher than that in closer markets. However, in the methods used for SEZ transmission analyses, total incremental transmission distance will be treated as a basic parameter to be minimized, subject to the requirements for assembling a collection of loads that satisfy the other requirements.

Recognizing Existing Transmission Lines Where/If Available Capacity Exists. For locations where reliable data sources (e.g., FERC 2011; WECC 2010, 2011a) indicate that load carrying capacity might be available on existing transmission lines, the algorithm will treat that resource as top priority. While excess capacity may be relatively rare for many pathways around SEZs, in cases where it does exist and the capacity is in the direction of the load area where power is needed, it represents the least-cost and least-impact alternative for delivering power from SEZs to load areas. As such, it would be the first option chosen relative to other options for

expanding or constructing new lines and/or ROWs. It is important to recognize that proper location of a solar resource has the potential to actually reduce congestion by locating the resource between the point of congestion and load and/or sending power in the opposite direction of existing congestion.

Taking Advantage of Existing ROWS or Planned Corridors Even Where Little or No Excess Capacity Exists. The identification of load areas for each SEZ will also recognize that existing lines provide favorable pathways even when excess capacity is limited. The incremental costs and impacts for expanding existing lines/ROWs are typically much lower than developing entirely new pathways. There are numerous alternatives for adding capacity along existing transmission pathways: adding new circuits/conductors to spare positions on existing structures; reconductoring the lines with high-temperature, low-sag conductors; making voltage upgrades; and/or widening the ROW to accommodate new circuits/structures. These options, along with the associated cost estimates, will be addressed in steps that follow after the initial sets of load areas are identified for each SEZ.

Recognizing Grid Topology as It Might Lead to Shorter Transmission Distances. "Incremental," or new, transmission distances will be recognized in the analysis for interconnected load areas. For example, if two load areas are reachable at different points along a single transmission line, the selection logic will recognize that if both loads are to be connected, the more-distant load area only incurs an incremental transmission enhancement distance to link between the nearer load area and the more-distant load area. Recognizing interconnection dependencies can alter the selection of the most favorable load areas to be served by a given SEZ.

Identifying Loads: (a) Identifying Adequate Loads To Absorb Planned SEZ Generating Capacities. For each SEZ, an adequate collection of load areas will need to be selected to absorb the estimated solar-generating capacity at full build-out. In cases where surrounding load areas represent small loads, this consideration will mean that multiple load areas will be identified for a given SEZ. Limits that operators of individual load areas would place on the use of renewable/solar power (see item (b) below) will also affect the number of load areas needed to accommodate generation from each SEZ. With respect to the SEZ transmission analysis, a simplifying assumption that no more than 20% of a load area's power requirements could be supplied from solar resources is made. In reality, the amount of solar power from an SEZ that individual load areas will accept will vary based on the amount already supplied by other renewable sources, and state and federal regulations and policies mandating the use of solar power. *(b) Limiting Solar-Generated Load Assignments for any Given Load Area To Represent a Reasonable Percentage of the Total Load for That Area*. For a given load area, only a portion of total peak load will be "eligible" to be served from an SEZ. This consideration recognizes that each load area would limit its exposure to variable loads as derived from solar generation sources. Initially, the proposed fraction to be applied to each load area would equal the Renewable Portfolio Standard (RPS) requirement (i.e., the fraction of electricity required to be generated from renewable sources for the state where the load area is located). Peak load estimates for load areas are expected to be approximated from a simple scalar based on population.

Allowing SEZs To Serve Out-of-State Load Areas. The initial assumption in this analysis will treat SEZs as able to serve both in-state and out-of-state loads. If interests or questions are raised regarding sensitivities to this assumption, they can be addressed relatively easily with additional case studies.

Implementation. The SEZ/Load-Area assignment algorithm will be solved by using a simple mixed-integer linear programming (MILP) formulation. By defining the factors outlined above, the MILP will identify the most effective collection of load areas for each SEZ. The formulation will be flexible in terms of potential modifications or enhancements once initial test cases are prepared and reviewed. In general, the algorithm will be formulated as a distance minimization problem, subject to constraints to ensure that adequate loads are designated to consume the solar-derived generation from a given SEZ.

Objective function: Minimize the sum of incremental transmission distances to all designated load areas, subject to the following constraints:

- Sum of "eligible" load from all selected load areas must be ≥ total SEZ generating capacity.

- SEZ-eligible load for each load area = load area peak load × RPS fraction (for state of load area).

- Follow existing/planned ROWs/corridors to in-state and out-of-state load areas.

- Use existing available capacity as possible (i.e., lowest incremental distance/impact.

- For congested pathways, assume new capacity would need to be added.

- Use "incremental" distances to load areas located along ROWs/corridors that serve other load areas.

In some cases, particularly for the smaller SEZs, the SEZ/Load-Area assignments may be obvious upon initial inspection of the grid topography and magnitudes of capacity involved. In such cases, it may not be necessary to actually construct or solve the MILP.

The end product of this process will be a list of logical load areas for each SEZ. These lists will be used to assess the distances, upgrade requirements, and costs for:

- Transmission tie-lines to connect with the existing grid (and potential transmission capacity on existing lines), and

- New transmission capabilities (on, or parallel to, existing/planned ROWs).

C.7.1.3.2 Transmission Analysis Methodologies

Subsequent to the identification of potential load areas as described in Section C.7.1.3.1, the following additional assumptions, methods, and data sources are proposed for use in identifying upgraded and/or new transmission facilities that would be needed for individual SEZs, and for estimating the environmental impacts and costs of these upgraded or new facilities.

The total load, in megawatts (MW) for each load area, will be roughly estimated by assuming a population-to-power density (P-P-D) of 400 people per MW. Since population is the most common parameter associated with a market area, the use of P-P-D is a convenient means of calculating the equivalent MW load given the population. The resulting MW load usually reflects the high side of the MW load estimate and, thus, supports analysis of upper bound impacts.

The DLT analysis (see Section C.7.1.3 for definition) will assume that all SEZ-generated power would require entirely new transmission lines. Where existing transmission lines are present, it is assumed that the new dedicated lines would be constructed parallel to the existing lines leading to the identified potential load areas and that they would require additional land for ROWs. The new transmission lines are assumed to traverse the identified potential load areas in sequence according to their linear distance from the center of the SEZ until the maximum allowable MW output for the SEZ is fully distributed. The purpose of the DLT analysis is to establish an approximate upper bound of potential impacts of transmission development associated with solar development in the SEZ in terms of land disturbance and cost.

The SLT analysis will examine existing transmission lines with potential spare capacity over a 10-year planning horizon, assuming that these lines could be used in transmitting electricity generated at the SEZ to various load areas. To accomplish this, the analysis will evaluate alternating current (AC) load flow data for the base year of 2011 through the tenth year of the assumed planning horizon. The difference between the line rating (in MW) and the base load flow (also in MW) is the allowable electrical capacity that could be used to transmit SEZ-generated power. If there is insufficient capacity on the existing line, the analysis will examine possible enhancements to existing transmission lines, as needed, to accommodate the full SEZ output. Added investment is also required for a tie-line or tie-lines that would run from the SEZ to the connecting point on the existing transmission line (note that larger SEZs may require more than one tie-line).

Within each methodology (i.e., DLT and SLT analyses), the goal is to identify transmission configurations that make efficient use of land and equipment investments, and provide other qualitative advantages (e.g., transmission system flexibility and long-term sustainability). Thus, the DLT analysis attempts to identify the best configuration for new dedicated lines, and the SLT analysis attempts to identify the most favorable option that recognizes the availability of existing transmission line capacity.

The planned data sources for the analyses include:

- Information about the proposed SEZs and potential generation levels as presented in the Draft PEIS, associated spatial data (available at http://solareis.anl.gov/maps/index.cfm), and revisions to the proposed SEZs described in Sections C.1 through C.6.

- WECC systems map and load flow data from FERC for the years 2010, 2015, and 2020 under peak summer demand (FERC 2011).

- WECC pathway reports for calibration adjustments to line capacity estimates: for example, *10-Year Regional Transmission Plan, WECC Path Reports, September 2011* (WECC 2011b).

- POWERmap data (Platts 2011): for load area identification and population estimates.

- The Electric Power Research Institute (EPRI) *Transmission Line Reference Book* (EPRI 2005).

- Various technical publications from the Institute of Electrical and Electronics Engineers, EPRI, WECC, and other organizations.

Major assumptions to be employed in the analyses are as follows:

1. The study horizon will be assumed to be 10 years and cover the period 2011 to 2020. This assumption is constrained mainly by the available load flow data and facility expansion information from FERC. FERC can provide load flow data only extending up to 2020. Load growth and transmission line loadings over this period of time will thus be included in the analysis.

2. Transmission lines that require new construction will be assumed to run parallel to existing transmission routes.

3. A ROW requirement of 200 ft (61 m) for 500-kV transmission corridors and a land requirement of 950 ft^2 (88.3 m^2) per megavolt-ampere (MVA) for the electric substations are assumed (Western 2009). These assumptions will be further reviewed and revised as needed prior to the Final Solar PEIS.

4. The Brenda SEZ will have a maximum output of 770 MW, which will remain constant over the planning horizon. (This is the assumption for the test case presented in Section C.7.1.4; however, a revised assumption on the amount of potential solar development at the Brenda SEZ now projects about 609 MW of generation. While some of the results will change, the basic steps and general findings are expected to remain the same as reported here.)

5. Other details: A present-worth method based on an opportunity cost of 3% will be employed. Projections for annual load growth will be assumed to be

directly proportional to population growth. Cost of electric energy will be assumed to be constant at about $100/MWh. Only investment costs for the transmission lines will be considered in this study. Maintenance cost will be neglected for the time being to simplify the illustration of the analysis procedure. These assumptions will be further reviewed and revised as needed prior to the Final Solar PEIS.

6. As a simplifying approach to recognizing the variability characteristics of solar generation, load areas are assumed to have a maximum supply of 20% that is eligible to be served by solar power. Thus a load area with a total load of 100 MW is assumed to represent only 20 MW of potential load for new solar power generated in the SEZs. This consideration recognizes that each load area would limit its exposure to variable generation as derived from solar sources. As stated in Section C.7.1.3.1, the amount of solar power from an SEZ that individual load areas will accept will vary based on the amount already supplied by other renewable sources and on state and federal regulations and policies mandating the use of solar power.

7. Transmission line expansion and reinforcements for 2011, 2015, and 2020 are based on the "Planned Facilities Map" provided by WECC via FERC 715 filings.

8. Peak baseline power flows will be derived from the proportional relationship between real power flows and the voltage angles. Power flow through a line can be estimated by taking the difference between the voltage angle for the sending and receiving terminals, and dividing by the line reactance (also requires applying appropriate unit-conversion factors).

9. The thermal ratings of the lines as contained in FERC Form 715 for WECC will be used to estimate spare capacity.

C.7.1.4 Test Case Transmission Analysis for the Proposed Brenda SEZ

The purpose of this test case is to demonstrate the effectiveness and usefulness of the planned approach for conducting enhanced transmission assessments as described in Section C.7.1.3 for proposed SEZs being carried forward to the Final Solar PEIS. The Brenda SEZ, located in Arizona, was selected for this test case because it represents a nontrivial combination of grid connection and delivery-to-load options that test the planned approach (e.g., proximity to existing transmission lines and alternative loads). A paper containing the details of the methods and assumptions used to conduct this test case analysis is available at the Solar PEIS project Web site (http://www.solareis.anl.gov).

It is important to point out that the results presented in this test case are preliminary and subject to refinement and validation via:

1. Utilizing WECC data sources and consulting with WECC, the California Independent System Operator (CAL ISO), and other pertinent utilities on the subjects of planned expansion facilities and spare transmission line capacities over the study horizon;

2. Re-affirming the method used for quantifying the magnitude of ~~s~~olar-eligible" loads at identified load areas; and

3. Augmenting the transmission design assumptions using additional transmission design reference materials (e.g., from EPRI, North American Electric Reliability Corporation, and power engineering companies).

As stated in Section C.7.1.3, the assumed maximum output from the proposed Brenda SEZ for the purposes of this test case analysis is 770 MW. For both the DLT analysis and the SLT analysis, it is assumed that a 10-mi (16-km) tie-line from the proposed SEZ to a connection point at the Salome Substation would need to be constructed. The primary candidates for Brenda SEZ load areas are the major surrounding cities. The dispersal pattern of the load areas partly determines the number of logical transmission schemes for the Brenda SEZ. The most likely load area groupings for the SEZ are (1) Phoenix/Tucson; (2) Yuma, El Centro, San Diego; (3) Las Vegas; and (4) Indio Coachella, Palm Springs, Hernet-San Jacinto, Riverside, and Los Angeles. These groupings provide for linking loads along alternative routes from the Brenda SEZ so that the SEZ's output of 770 MW can be fully allocated.

Dedicated-Line Transmission Analysis. The DLT analysis approach assumes that the Brenda SEZ will require all new construction for transmission lines (i.e., dedicated lines) and substations. The new transmission lines(s) would directly convey the 770-MW output of the Brenda SEZ to the prospective load areas for each possible transmission scheme. It also assumes that all existing transmission lines in the WECC region are saturated and have little or no available capacity to accommodate Brenda's 770-MW output throughout the entire 10-year study horizon.

Table C.7-1 summarizes the distances to the various load areas over which new transmission lines would need to be constructed by leg, as well as the assumed number of substations that would be required. Table C.7-2 shows the net present value (NPV) of the various transmission configurations and takes into account the cost of constructing the lines and the projected revenue stream over the 10-year horizon. A positive NPV indicates that revenue more than offsets investments. The estimated land use requirement for the various transmission configurations is presented in Table C.7-3.

The results of this preliminary test case DLT analysis indicate that the most economically attractive configuration (i.e., the configuration with the highest positive NPV) would be Transmission Scheme 1, which treats Phoenix and Tucson as the primary markets. The second most economic option is Scheme 2 which would primarily serve the San Diego Area. The transmission scheme that identifies Las Vegas as the primary market falls short of fully

TABLE C.7-1 Potential Transmission Schemes, Estimated Solar Markets, and Distances to Load Areas for the Brenda SEZ

Transmission Scheme	City	Estimated MW for Solar Market[a] (based on population size)	Total Solar Market (MW)	Sequential Distance (mi)[b]	Total Distance (mi)	Line Voltage (MW)	Number of Substations
1	Phoenix	652	906	108	224	500	3
	Tucson	254		116			
2	Yuma	75	878	79	226	500	4
	El Centro	38		56			
	San Diego	765		91			
3	Las Vegas	467	467	188	188	500	2
4	Indio Coachella	26	2,934	131	262	500	2
	Palm Springs	22		18			
	Hernet-San Jacinto	65		27			
	Riverside	121		27			
	Los Angeles	2,699		59			

[a] The estimated MW for solar market in each city is based on the 2010 population; 20% of the total estimated MW value is assumed as the maximum solar market.

[b] To convert mi to km, multiply by 1.609.

TABLE C.7-2 Comparison of Potential Transmission Lines with Respect to Net Present Value

Transmission Scheme	City	Present Value Transmission Line Cost (million $)[a]	Annual Sales Revenue (million $)[b]	Present Worth Revenue (million $)[c]	Net Present Value Revenue (million $)
1	Phoenix, Tucson	784	134.9	1,152	368
2	Yuma, El Centro, San Diego	791	134.9	1,152	361
3	Las Vegas	658	81.8	699	41
4	Indio Coachella, Palm Springs, Hernet-San Jacinto, Riverside, Los Angeles	917	134.9	1,152	235

[a] Assumes construction cost spike is at beginning of year 1; assumes a discount rate of 3%.

[b] Assumes a revenue spike occurs at the end of each year; assumes a discount rate of 3%.

[c] Assumes a discount rate of 3%.

TABLE C.7-3 Comparison of the Various Transmission Line Configurations with Respect to Land Use Requirements

Transmission Scheme	City	Total Distance (mi)[a]	Number of Substations	Land Use (mi^2)[b]		
				Transmission Line[c]	Substation[d]	Total
1	Phoenix, Tucson	224	3	8.4848	0.0289	8.51
2	Yuma, El Centro, San Diego	226	4	8.5606	0.0289	8.59
3	Las Vegas	188	2	7.1212	0.0175	7.14
4	Indio Coachella, Palm Springs, Hernet-San Jacinto, Riverside, Los Angeles	262	6	9.9242	0.0289	9.95

[a] To convert mi to km, multiply by 1.609.

[b] To convert mi^2 to km^2, multiply by 2.590.

[c] Assumes a ROW width of 200 ft (61 m) for a 500-kV line.

[d] Assumes a generic land use requirement for substations of about 950 ft/MVA (290 m/MVA). The size of each substation per scheme varies but has a sum total capacity limit of 770 MW × 1.1 (or about 847 MVA, assuming 1 MW = 1.1 MVA).

accommodating the maximum potential of the Brenda SEZ, and thus appears as the least attractive configuration in terms of NPV. However, the Las Vegas transmission scheme has the smallest impact in terms of amount of land disturbance. The worst transmission configuration in terms of the amount of land disturbed and NPV is Scheme 4, which would deliver solar power from the Brenda SEZ to Los Angeles.

Shared-Line Transmission Analysis. The SLT analysis provides a more detailed analysis of transmission requirements by assessing the available capacity of existing lines between the SEZ and the load centers and the need for new dedicated lines. This approach:

1. Takes into account the configuration and performance of the existing transmission system and explores the possibility of using the existing spare capacity (if there is any) to facilitate the conveyance of power from the SEZ to the prospective load areas;

2. Maximizes the utilization of common resources (e.g., spinning reserves and ancillary power reserves) within the context of a wider grid;

3. Accounts for the effects of future expansion plans of relevant utilities in the WECC region; and

4. Takes advantage of connectivity between load areas and recognizes cumulative solar-eligible demand requirements.

The SLT analysis makes use of AC load flow data to establish normal flow patterns (i.e., magnitude and direction of power flows) on existing high-voltage lines surrounding the SEZ. It then calculates the spare capacity of the existing high-voltage lines under peak load conditions for 2011, 2015, and 2020. For the 10-year planning horizon, electrical growth for the load areas is recognized, including its effects on the loading levels of the transmission lines.

Using this approach for the Brenda SEZ, only two transmission configurations emerged as favorable; other configurations are possible but are clearly not optimal relative to the top two configurations. The first transmission scheme analyzed Phoenix and San Diego as the primary markets; the second analyzed Los Angeles as the primary market. Tables C.7-4 and C.7-5 show the estimated spare capacity on existing lines for 2011, 2015, and 2020 for both of these transmission schemes. For both transmission schemes and all three years, the estimated spare capacity exceeds the 760 MW that could be generated from the proposed Brenda SEZ; thus, there is enough spare capacity through 2020 to accommodate the SEZ outputs.

Note that the current scope of analysis will treat each SEZ independently. Conducting coordinated transmission development studies that consider multiple SEZs contributing power to the same load center or centers is considered beyond the scope of the additional SEZ-specific transmission analysis planned for the Final Solar PEIS. However, discussion of the likelihood of potential impacts from multiple SEZs will be included in the Final Solar PEIS, based on the likely load centers identified for the SEZs.

TABLE C.7-4 Estimated Spare Capacity on Existing Lines from the Proposed Brenda SEZ to Phoenix and San Diego[a]

Transmission Line Start/End Locations	Transmission Line Description	Spare MW		
		2011	2015	2020
Devers to Palo Verde	1 circuit 500 kV	4,693	4,488	4,582
Palo Verde to Rudd	1 circuit 500 kV	1,322	1,795	1,270
Hassayam to N. Gila	1 circuit 500 kV	2,923	1,144	2,385

[a] Details of the calculation of spare MW using a calculated sending angle and receiving angle are provided in the full report for this test case (see the Solar PEIS project Web site [http://solareis.anl.gov]).

TABLE C.7-5 Estimated Spare Capacity on Existing Lines from the Proposed Brenda SEZ to the Los Angeles Area[a]

Transmission Line Start/End Locations	Transmission Line Description	Spare MW		
		2011	2015	2020
Palo Verde to Devers	2 circuit 500 kV[b]	1,637	NA	NA
Devers to ValleySC	1 circuit 500 kV	1,615	NA	NA
Palo Verde to Colorado River	1 circuit 500 kV	NA[c]	1,158	958
Colorado River to Devers	2 circuit 500 kV	NA	5,738	5,636
Devers to ValleySC	2 circuit 500 kV	NA	4,001	3,482
ValleySC to Serrano	1 circuit 500 kV	2,434	1,979	2,532

[a] Details of the calculation of spare MW using a calculated sending angle and receiving angle are provided in the full report for this test case (see the Solar PEIS project Web site [http://solareis.anl.gov]).

[b] Conflicting sources: single circuit per Powermap; double circuit per WECC diagram.

[c] NA = not applicable.

Discussion and Caveats to the Analyses. Although the DLT analyses may be useful in determining higher cost/higher impact estimates for the Solar PEIS, these analyses do have shortcomings. The approach ignores the systems approach, whereby common reserves and spares are shared within a system to maximize the use of available resources. Also, because the

transmission lines are assumed to be dedicated to SEZ operation, their utilization factor over the planning horizon would remain essentially constant at about 20% (based on the estimated average capacity factor of solar facilities), which is low and would not likely justify the huge investments required. It also holds the SEZ owners captive to being the only probable investor on the transmission lines. Because of fundamental limitations for the DLT analysis as discussed above, the transmission configurations resulting from this approach should be considered hypothetical.

An important finding from the SLT analysis is that there appears to be spare capacity available in the existing 500-kV network linking the proposed Brenda SEZ to major load areas and potential solar energy markets. The 10-year projection of the loading levels for existing and planned 500-kV transmission lines also predicts the availability of spare capacity to accommodate the SEZ output. However, a limitation of this analysis is that it does not investigate potential queues of customers who might be waiting to occupy such excess capacity. Nonetheless, this finding of potential spare capacity would indicate that the transmission investment cost for this SEZ could be minimal, consisting mainly of approximately $35 million to construct the tie-line to existing transmission (assuming a cost of $3.5 million per mile. This finding needs to be confirmed through further peer review with transmission planning agencies, particularly the WECC.

C.7.2 Water Resources Action Plan

There are seven main action plan items relating to water resources that apply to all SEZs being carried forward. The following sections explain each action plan item and provide some additional consideration for consultation with other federal, state, and local agencies and feasible timelines for the additional work.

C.7.2.1 Planning-Level Inventory of Water Resources

The Draft Solar PEIS summarized surface water and groundwater resources for individual SEZs at the programmatic level, but a more in depth or planning-level inventory would provide a common resource for developers of individual SEZs, as well as address comments on the Draft Solar PEIS.

The planning-level inventory of water resources will be presented in the Final Solar PEIS. Products of the planning-level inventory will include (sources in parentheses):

- Maps of basin valley and surrounding mountain ranges
  - All canals and perennial, intermittent, ephemeral streams (U.S. Geological Survey [USGS] National Hydrography Dataset [NHD])
  - HUC8 (8-digit, 4th-level hydrologic unit code) watersheds (USGS NHD)
  - Groundwater wells (USGS National Water Information System [NWIS] and Water Science Centers, National Resources Conservation Service [NRCS])

  - Springs (USGS NWIS)
  - Groundwater basin(s) (state water agency)
  - Wetlands (USFWS National Wetlands Inventory [NWI] or state agency)
  - Playas and dry lakes (USGS NHD or state agency)
  - Meteorological station locations (USGS NWIS, Western Regional Climate Center [WRCC], state agency climate stations, e.g., California Irrigation Management Information System [CIMIS] in California)

- Tabular information
  - Canals and perennial and intermittent streams (USGS NHD)
  - Total length of ephemeral stream channels (USGS NHD)
  - Total length of stream channels by stream order (USGS NHD)
  - Annual, seasonal, peak discharge values (USGS NWIS and Water Science Centers)
  - HUC8 watershed areas (USGS NHD)
  - Groundwater basins—area, generic properties (state water agency, PEIS, USGS NWIS and Water Science Centers, NRCS)
  - Wetlands—areas, types (USFWS NWI or state agency)
  - Springs—names, elevations, flows (USGS NWIS or state agency)
  - Climate—precipitation, snowfall, evapotranspiration (USGS NWIS, WRCC, state agencies)

- Google Earth™/geographic information system (GIS) data files, providing links to datasets (USGS NWIS)
  - Stream gages—flows and water quality
  - Groundwater wells—depth to groundwater and water quality
  - Meteorological stations—temperatures, precipitation, snowfall, etc.

C.7.2.2 Floodplain Determinations

In May 27, 1977, the President signed Executive Order 11988 –Floodplain Management," which states that federal agencies should avoid surface disturbance activities within identified 100-year floodplains (*Federal Register*, Volume 42, page 117, May 27, 1977). Only a few SEZs being carried forward (Afton, Dry Lake, Imperial East, and Gillespie) have prior floodplain analyses available to map exclusion floodplain areas. Identifying 100-year floodplain areas must be performed in order to define non-development areas within SEZs. Given the episodic and sometimes catastrophic nature of rainfall-runoff events in the desert southwest, floodplain analyses could extend beyond the 100-year floodplain to regions susceptible to extreme flooding events (e.g. alluvial fans, high gradient areas).

Floodplain determinations require field surveys, consultations with the Federal Emergency Management Agency (FEMA) and state/local flood control agencies, and hydrologic analyses. The primary steps to identifying floodplain areas include the following:

- Identifying of main surface drainage pathways within and adjacent to SEZs

- Consulting with FEMA and state/local flood control agencies regarding floodplain mapping protocols

- Conducting field surveys
  - Channel geometries
  - High-water-mark indicator maps
  - Ground-truthing NHD channel networks

- Performing hydrologic analyses
  - Analysis of flood frequency
  - Hydraulic modeling of runoff routing
  - Determination of inundation areas

- Obtaining approvals (BLM-coordinated)
  - FEMA/agency for floodplains

C.7.2.3 Jurisdictional Waters Determinations

Section 404 of the Clean Water Act (CWA) requires a permitting process for dredging and filling activities affecting ~~j~~urisdictional waters" of the United States. The U.S. Army Corps of Engineers (USACE) and EPA oversee the permitting process and make determinations on what constitutes jurisdictional water on a case-by-case basis. Jurisdictional water determinations can be made by using a variety of techniques, including topographic maps and aerial photographs, field surveys, and hydrologic analyses. The appropriate method for jurisdictional water determinations must be coordinated with the appropriate offices of the USACE and EPA. If field surveys are required, coordination with field surveys for floodplain determinations should be made. Jurisdictional water determinations will not define non-developmental areas within SEZs but will determine where CWA Section 404 permitting will be required.

C.7.2.4 Significant Ephemeral Waters Determinations

In addition to floodplains and jurisdictional waters, several commentors and cooperators had concerns regarding the loss of ephemeral stream networks because of their importance to hydrology, geomorphology, and habitat. The Draft Solar PEIS identified significant washes to be excluded from development that showed physical evidence of conveying substantial flood flows (these areas will likely overlap with 100-year floodplain mapping). Further analyses should be performed to identify dense ephemeral stream networks that overlap with critical habitat, provide significant groundwater connectivity, or constitute critical geomorphic features necessary for maintaining connected features (e.g., dunes, eolian transport corridors, and active alluvial fans). These additional analyses should include consultation with local BLM offices, cooperating federal agencies, and state agencies regarding critical ephemeral stream networks for habitat, hydrologic, and geomorphic value.

C.7.2.5 Long-Term Monitoring Programs

Careful siting and planning of solar facilities can reduce adverse impacts on surface water and groundwater resources, but there are many unknowns regarding both surface water and groundwater processes. Establishing a robust monitoring program and analysis tools for SEZs would gain important information on whether surface water or groundwater resources are being affected by solar facilities. Monitoring programs would need to incorporate stakeholder involvement including appropriate federal/state/local agencies (e.g., local BLM offices, USGS Water Science Centers, USFWS, National Park Service [NPS], state water resources agencies) that conduct water resources monitoring. The Final Solar PEIS will recommend a process and methods and tools for developing SEZ monitoring programs for water resources.

C.7.2.5.1 Stakeholder Monitoring Committee

Stakeholder agencies involved with water rights and water resources for each SEZ could be identified to oversee the development and implementation of a monitoring program. The Final Solar PEIS will describe the generic functions of stakeholder committees that could carry out long-term monitoring at SEZs.

C.7.2.5.2 Surface Water and Groundwater Monitoring

The basic components for a long-term monitoring program of surface water and groundwater resources will be described in the Final Solar PEIS. Examples of the basic components at an individual SEZ include recommendations on monitoring parameters, measuring frequency, and stakeholder involvement.

C.7.2.6 Modification of Design Features

Public and cooperator comments on the Draft Solar PEIS provided additional information on water resources and new information that could be obtained from further analyses described in the action plans. New information obtained from comments and work done for proposed action plans will be used to modify design features for the Final Solar PEIS. Examples include the following:

- Describing long-term monitoring programs that can be implemented for SEZs;

- Requiring water flow meters on groundwater pumps to accurately measure extractions (to be used in groundwater models and analyses to support long, term monitoring programs); and

- Requiring varying levels of groundwater analyses from developers depending on proposed water use (e.g., less detailed analyses required for photovoltaic [PV] facilities and more detailed analyses for higher water use parabolic trough facilities)

C.7.2.7 Groundwater Analyses

Utility-scale solar energy facilities have the potential to affect groundwater. The Draft Solar PEIS analysis of groundwater impacts was done qualitatively by summarizing available information relative to groundwater processes and comparing that information to estimates of potential groundwater extractions for the four main solar energy technologies evaluated. Seven of the SEZs being carried forward that would benefit from a more quantitative analysis have been identified: Afton, Amargosa Valley, Brenda, Dry Lake, Dry Lake Valley North, Imperial East, and Riverside East. At these seven SEZs, numerical groundwater modeling analyses will be presented in the Final Solar PEIS to better address two major concerns: potential drawdown impacts on surface water features (e.g., loss of springs, change in river discharge) and drawdown impacts on other groundwater users and groundwater processes. Where there are existing groundwater models, the following will be added:

- Groundwater model refinements for SEZ analysis, and
- Analyses of full build-out pumping scenarios.

Where there are not existing groundwater models, the following will be provided:

- Simplified, superposition-based, groundwater modeling; and
- Analyses of full build-out pumping scenarios.

C.7.3 Visual Resource Design Features for Select SEZs

The Draft Solar PEIS identified design features to lessen the adverse impacts of solar development on visual resources that would be applicable to all projects located on BLM-administered lands (see Section A.2.2.13 of the Draft). Additionally, the Draft Solar PEIS identified the need for SEZ-specific design features to reduce impacts on visual resources for eight of the proposed SEZs being carried forward for the Final Solar PEIS: Afton, Amargosa Valley, Antonito Southeast, De Tilla Gulch, Fourmile East, Gillespie, Los Mogotes East, and Riverside East. For three of these proposed SEZs (De Tilla Gulch, Fourmile East, and Gillespie), the recommended mitigation was to prohibit power tower facilities within the SEZ. For the other SEZs, the mitigation proposed in the Draft Solar PEIS was that development within certain portions of the SEZ be restricted to meet visual resource management (VRM) Class II- or Class III-consistent objectives (see Section 5.12 of the Draft PEIS for definitions of VRM classes). For the proposed Afton, Amargosa, Fourmile East, and Riverside East SEZs, some or all of the area

proposed for VRM Class II- or Class III-consistent management objectives has been eliminated from the SEZ, so that the potential for large impacts on visual resources has been reduced.

The BLM has proposed revised SEZ-specific design features for visual resources for all eight SEZs listed above, except De Tilla Gulch; these design features are listed in the SEZ Action Plans (Sections C.1 through C.6). In addition to the SEZ-specific design features, the BLM has determined that proposed development within these SEZs shall abide by the Draft Solar PEIS visual resource design features, with the addition of the following requirements pertaining to areas previously listed for meeting VRM Class II- and III-consistent management objectives:

- No vertical development over 100 ft (30.5 m), including transmission towers and other structures.

- Color-treat all facilities using color selection from the BLM Environment Color Chart CC-001 to reduce visual color contrast with surrounding landscape (including, but not limited to, buildings, storage facilities, substation equipment, solar panel frames and electrical storage boxes).

- Color-treat surfaces cleared and stabilized with gravel paving to reduce color contrast.

- Bury all transmission lines routed through the areas within the SEZs that are listed for meeting VRM Class II-consistent management objectives.

- Color-treat solar panel backs to reduce visual contrast with landscape setting.

- Coat security fencing with black polyvinyl or other visual contrast-reducing color.

- Shield glint and glare emitted from the surfaces of concentrated solar mirrors and heliostats, solar engine mirrors, and other ancillary facilities shall be shielded from sensitive observation areas including, but not limited to, National Scenic and Historic Trails; National Parks and Wildlife Refuges; Wilderness Areas and Wilderness Study Areas; Special Recreation Management Areas; and National State and Back Country Byways. If shielding of the glare and glint is impossible in these areas, then the default is the use of PV technology.

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APPENDIX D:

PROPOSED IDENTIFICATION PROTOCOL FOR NEW SOLAR ENERGY ZONES

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APPENDIX D:

PROPOSED IDENTIFICATION PROTOCOL FOR NEW SOLAR ENERGY ZONES

The solar energy zones (SEZs) being carried forward in this Supplement identify approximately 285,000 acres (1,153 km^2) across the 6-state study area. In addition, the U.S. Department of the Interior Bureau of Land Management (BLM) has made a commitment to continue processing pending applications. Although this is a strong start in facilitating utility-scale solar energy development on public lands, the BLM intends to identify new SEZs and/or expand existing SEZs on an as-needed basis. The BLM has already initiated efforts to identify new SEZs in the states of California, Arizona, Nevada, and Colorado through ongoing state-based efforts (see Section 2.2.2.2.6 of this Supplement for more information) and anticipates identifying new or expanded SEZs in the remaining states in the near future.

The BLM believes that having a workable process for identifying new SEZs is an essential element of its overall approach to solar energy development. The process must be open and transparent, with opportunities for substantial involvement of stakeholders including solar industry and transmission providers. This protocol establishes a process that would be undertaken at the state or field office level as an individual land use planning effort or as part of an ongoing land use plan revision. It is the BLM's goal to complete the work of identifying new SEZs and amending applicable land use plans within 12 to 18 months of initiating such effort.

New or expanded SEZs should be identified in the context of existing solar market conditions, existing and planned transmission systems, and new state or federal policies affecting the level and location of utility-scale solar energy development. The BLM, in conjunction with the states and the U.S. Department of Energy, will periodically review the need for additional public lands for solar development following the protocol outlined below.

This appendix to the Supplement to the Draft Solar Programmatic Environmental Impact Statement (PEIS) presents a step-by-step process for identifying new SEZs. The five steps in the process, outlined in the following sections, are as follows:

1. Assess the need for new SEZs,
2. Establish technical and economic feasibility criteria,
3. Apply environmental screening criteria,
4. Consider other factors, and
5. Analyze proposed SEZs through a planning and National Environmental Policy Act (NEPA) process.

D.1 ASSESS THE NEED FOR NEW SEZS

Assessment of the need for new or expanded SEZs will take place a minimum of every 5 years in each of the 6 states covered by the Solar PEIS. The assessment of need may take place as part of the regular land use planning process or as a separate effort. BLM State Offices will be

responsible for overseeing the assessment of SEZs and for making the determination that additional acreage is needed following appropriate stakeholder outreach. Acknowledging that significant changes can occur in the interim between required assessments of need, the BLM will also provide for an assessment triggered by a petition process.

Petitions for reassessing the need for new or expanded SEZs must be submitted in writing to the appropriate BLM State Director with documentation supporting the request. Petitions must have a rational basis and should be linked to factors such as policy and/or market changes (e.g., increase in state or national renewable standards or approval of a foundational transmission line). Developers, environmental stakeholders, local and state governments, and/or industry associations may collectively or individually petition the BLM to consider specific areas for new or expanded SEZs based on market interest or other relevant considerations. Petitioners may also request changes in already identified SEZs, such as eliminating or revising boundaries due to changes in status of species or critical habitat under the Endangered Species Act (ESA). In addition to the petition process, the public may also raise the need for new, expanded, or modified SEZs through the land use planning scoping process.

When considering the need for new or expanded SEZs, the BLM will rely on outside expert consultation regarding electricity demands, markets, and renewable energy policies. Utility-approved plans, state public utility commissioners, and regional planning entities such as the California Independent System Operator and the Western Energy Coordinating Council can all provide useful inputs into the BLM's determination of needed additional acreage to meet renewable generation goals. The BLM will take into consideration policy goals and trends in the solar market. The BLM will consider the availability of land in existing SEZs when it evaluates the need for new or expanded SEZs. The BLM's assessment of need should also establish as necessary new state-based Reasonably Foreseeable Development Scenarios that incorporate any new federal or state policies affecting projections.

D.2 ESTABLISH TECHNICAL AND ECONOMIC FEASIBILITY CRITERIA

In addition to considering the amount of renewable energy needed across a state or region, the BLM's assessment will take into account technological advances in solar energy generation systems, identify where new energy is going to be needed and at what levels, and specify any existing constraints. These additional factors will influence not only whether new or expanded SEZs are needed but also where they should logically be located, considering transmission, load, and solar resources and their configuration in terms of size and terrain.

A number of factors determine the technical and economic suitability of an area for utility-scale solar energy development, including the quality of the solar resource, terrain, and proximity to existing load and infrastructure. These factors may vary by state and/or region and will continue to evolve over time. As part of its SEZ identification process, the BLM will work with outside experts and stakeholders to establish the following technical and economic suitability criteria.

D.2.1 Size Threshold

An SEZ should generally encompass an area of 5,000 acres (20.2 km^2) or more, so that the supporting infrastructure can be shared by multiple facilities. Smaller areas, particularly areas near existing and available transmission infrastructure, may be suitable for solar facilities. Smaller areas of public lands adjacent to private, state, or other federal lands suitable for solar development may also be useful as SEZs, particularly in conjunction with the adjacent areas. In general, however, SEZs on public lands should be large enough to generate substantial quantities of solar-generated power in order to justify the effort and expense required to determine whether a specific area is well suited for solar development.

D.2.2 Solar Insolation Level

Solar insolation levels in SEZs should be high, thus allowing for optimum power production. Under BLM's proposed Solar Energy Program, a minimum direct normal solar insolation level of 6.5 kWh/m^2/day is required for BLM-administered lands to be available for utility-scale solar development. Although locations with insolation values lower than 6.5 kWh/m^2/day would appear less economically viable given current technologies, it may be appropriate to select and establish new SEZs in areas with lower insolation levels, if the areas are otherwise well suited for development and provide for economically viable projects.

Higher insolation values provide significant benefits for solar generation facilities. For instance, a reduction of 1 kWh/m^2/day in insolation is equivalent to approximately a 10% reduction in efficiency and, in turn, a proportional increase in costs and land use footprint (due to the need for additional solar collection equipment to provide the same quantity of energy). Different types of insolation are most relevant to the different large-scale solar generating technologies. For concentrating solar technologies, direct normal insolation is most pertinent, while for photovoltaic (PV) systems, global tilt insolation is the appropriate measure of the solar resource. As part of the process to identify new SEZs, the BLM should consider both the direct normal insolation and the global tilt insolation.

D.2.3 Slope Threshold

Most solar generating technologies must be sited on relatively flat ground to ensure that the solar collectors can utilize the solar resource effectively. Depending on the technology, the required slope can range from less than 2% to more than 5%, although lower slopes are generally better for siting solar generation. Under BLM's proposed Solar Energy Program, slopes of less than 5% are required for BLM-administered lands to be available for utility-scale solar development. In the selection of new SEZs on BLM-administered lands, some flexibility in applying the slope criterion may be appropriate, particularly for PV or dish engine technologies that are more tolerant of lands with steeper slopes, if the area is otherwise well suited for development and provides for economically viable projects. It is unlikely that lands with slopes of greater than 10% would be technically viable for utility-scale solar production.

D.2.4 Load Areas To Be Served

When considering the appropriate locations for new SEZs, the BLM will determine the load areas likely to be served by needed new solar generation. The BLM should rely on outside expert consultation regarding electricity demands, markets, and renewable energy policies. The BLM should also consider policy goals and trends in the solar market. For example, it could be that the Renewable Portfolio Standard in a given state has been met (e.g., Nevada) and new solar development is expected to serve demand in an adjacent state (e.g., California). In this example the logical location for new SEZs may be in proximity to existing transmission close to the border of the adjacent state.

D.2.5 Infrastructure Access

As part of the identification of new or expanded SEZs, the BLM will consider proximity to existing infrastructure, such as transmission lines, utility corridors, and roads. Where SEZs can be located close to existing infrastructure, environmental disturbance may be minimized through use of the existing facilities (in some cases, however, transmission lines may be sited in environmentally sensitive areas that are not suitable for locating SEZs). Use of existing infrastructure may also reduce costs of construction and mitigation, making locations close to existing and utilizable infrastructure attractive to developers.

For initial consideration of a potential SEZ location, the existing and proposed transmission lines serving the area should be cataloged in relation to the potential power generation from the proposed SEZ location. The BLM should then consult with state and regional transmission planning and coordination authorities, state energy offices, and transmission system operators to evaluate available capacity on the existing and proposed lines and to determine whether transmission access issues might create barriers to development in a specific area. Where new transmission lines are needed, they should be planned to utilize existing rights-of-way (ROWs) or designated utility corridors if possible. To formalize transmission-related goals and objectives for new SEZs, the BLM may find it appropriate to enter into a Memorandum of Understanding with appropriate transmission planners and providers.

It is important to note that efforts to assess the feasibility and cost of supplying transmission to a specific area have a high degree of uncertainty, because new transmission lines are proposed, constructed, and added to the existing transmission grid over time and because the available capacity on the grid also changes as demand increases and new power sources are added over time. Due to the remote locations of many prime solar resource areas, transmission upgrades and additions will generally be needed to connect those locations to the grid. SEZs should be located in areas where it will be feasible and cost-effective to connect new power sources to the grid.

The ability to utilize existing paved roads for access to SEZs can also reduce impacts associated with development; therefore, SEZs should be located adjacent to major paved roads where possible. For potential SEZs where existing paved roads are located some distance away,

existing dirt roads should be upgraded for site access to the greatest extent possible in order to minimize land disturbance.

D.3 APPLY ENVIRONMENTAL SCREENING CRITERIA

D.3.1 Program Exclusion Criteria

The BLM will apply program exclusion criteria established through the Solar PEIS to lands that meet the established technical and economic feasibility criteria described above.

BLM-administered lands off-limits to utility-scale solar energy development include lands prohibited by law, regulation, presidential proclamation, or executive order (e.g., lands in the National Landscape Conservation System). As part of the Draft Solar PEIS, the BLM identified additional categories of lands that are known or believed to be unsuitable for utility-scale solar development. The BLM's proposed Solar Energy Program identifies these lands as exclusion areas for utility-scale solar energy development ROWs. The categories of lands that have been proposed as exclusion areas for utility-scale solar energy development ROWs have been updated as part of this Supplement and are described in Section 2.2.2.1.

D.3.2 Application of Relevant Land Use Plan Decisions

State and field offices undertaking efforts to identify new or expanded SEZs should apply all relevant decisions in existing land use plans (e.g., ROW avoidance and exclusion areas, timing restrictions, and so forth).

D.3.3 Additional Locally Relevant Screening Criteria

State and field offices undertaking efforts to identify new or expanded SEZs may choose to identify and apply additional screening criteria based on local conditions and institutional knowledge in consultation with other local, state, and federal authorities and Tribes.

The BLM should use landscape-scale ecological assessments to identify, and exclude from SEZs, areas of high ecological value or importance (e.g., BLM's rapid ecological assessment, California's Desert Renewable Energy Conservation Plan [DRECP], The Nature Conservancy's eco-regional assessments, and Crucial Habitat Assessment Tools being developed pursuant to the Western Governors Wildlife Council "Wildlife Corridors Initiative"). For example, in areas with pre-existing landscape-scale conservation plans, such as the DRECP in California, future SEZs will not be considered in areas needed to achieve biological goals and objectives established in the plan. Other types of areas to screen for based on landscape-scale information may include areas with significant populations of sensitive, rare, and special status species or unique plant communities, important biological connectivity areas for special status species, designated wildlife habitat management areas, and areas with high concentrations of

ethno-botanical resources of importance for Native American use. Potential landscape-scale effects of development should be evaluated through consultation with relevant federal, state, and local resource management agencies and Tribes.

To identify additional locally relevant screening criteria, the BLM will undertake consultation with appropriate land management agencies for consideration of areas close to special designations such as the National Parks, National Refuges, and National Forests. Such consultation may result in agreements not to locate SEZs near specific units, based on an agency's assessment of potential adverse impacts on those units.

As its environmental analysis for individual solar ROW applications on public lands continues, the BLM is expanding its knowledge of areas not suitable for development. Areas eliminated from ROW applications due to resource conflicts (e.g., rare vegetation or desert washes) may provide additional screening criteria for SEZs.

D.4 CONSIDER OTHER FACTORS

D.4.1 Identify Disturbed or Previously Disturbed Sites

As part of its SEZ identification process, the BLM will identify disturbed or previously disturbed sites that may be suitable for new SEZs. Examples include, but are not limited to, the following:

- Lands that have been mechanically disturbed or degraded;
- Lands that have been "type-converted" from native vegetation through plowing, bulldozing, or other mechanical impact, often in support of agriculture or other land cover change activities (e.g., mining, clearance for development, or heavy off-road vehicle use);
- Brownfields and other contaminated or previously contaminated sites identified by the Environmental Protection Agency's RE-Powering America's Land Initiative (http://www.epa.gov/renewableenergyland/); and
- Idle or underutilized industrial sites.

Sources of information will include, but are not limited to, the BLM's landscape-scale ecological assessments, which identify converted or highly degraded lands on BLM-administered and adjacent federal and nonfederal lands.

D.4.2 Identify Opportunities To Combine Other Federal and Nonfederal Lands

As part of the SEZ identification process, the BLM will take into account opportunities to partner with adjacent federal and nonfederal landowners (e.g., private, state, Tribal, or

U.S. Department of Defense-withdrawn lands). For example, SEZs may be located on public lands of comparatively low resource value or small size situated adjacent to degraded and affected private lands. This combination of BLM-administered and nonfederal lands could allow for a combined use area, allowing for the expansion of renewable energy development onto well-suited adjacent lands.

D.5 ANALYZE PROPOSED SEZS THROUGH A PLANNING AND NEPA PROCESS

Upon the completion of the preliminary steps outlined above, the BLM will publish a Notice of Intent (NOI) in the *Federal Register* stating its intent to prepare a Land Use Plan amendment(s) to identify new or expanded SEZ(s) and prepare the associated NEPA documentation. The NOI will also begin the formal scoping process (40 CFR 1501.7). Through the scoping process, the BLM will solicit input on the technical and economic suitability criteria, locally relevant screening criteria, disturbed and previously disturbed lands and opportunities for federal–nonfederal partnerships. Based on scoping, the BLM will identify potential SEZs to be analyzed through the planning and NEPA process. The public will also be invited to nominate proposed SEZs that meet the objectives of the planning effort through the scoping process. The BLM will document the results of its scoping in a publicly available scoping report (43 CFR 1610.2(d)).

When the BLM is preparing environmental impact statements (EISs) for new SEZs, its goal will be to produce documents with comprehensive analyses of resources within the proposed SEZ at a level of detail sufficient to allow for tiering of future solar projects within the SEZ. The potential impacts associated with the development of transmission interconnection and other infrastructure to support the establishment of an SEZ will be considered as part of the NEPA review for the SEZ. Analysis of SEZs will also include appropriate consultations pursuant to the ESA and the National Historic Preservation Act. The BLM will make the draft land use plan amendment and draft EIS available for a 90-day public comment period (43 CFR 1610.2(e)). The final EIS and Record of Decision will amend affected land use plans.

Through the planning and NEPA process, the BLM will refine and evaluate proposed SEZs based on resource-specific considerations. Chapter 5 of the Draft Solar PEIS includes a comprehensive description of the impacts of solar energy development and possible mitigation measures in the categories below. This information will be used as a guide to inform the analysis of SEZs.

- Lands and Realty
- Specially Designated Areas and Lands with Wilderness Characteristics
- Livestock Grazing
- Wild Horses and Burros
- Wildland Fire

- Recreation
- Military and Civilian Aviation
- Geologic Setting and Soil Resources
- Minerals
- Water Resources
- Ecological Resources
- Vegetation and Plant Communities
- Wildlife
- Aquatic Biota
- Special Status Species
- Air Quality and Climate
- Visual Resources
- Acoustic Environment
- Paleontological Resources
- Cultural Resources and Native American Concerns
- Socioeconomics
- Environmental Justice
- Cumulative Impact Considerations

While establishing SEZ boundaries that avoid sensitive resources is generally the most effective means of ensuring resource protection, complete avoidance of all sensitive resources is not always possible. Depending on the size of a proposed new SEZ and the location of resources within an SEZ, it may be practical to include some areas within the boundaries of an SEZ, with requirements that no disturbance occur in these areas (i.e., solar facilities would be required to be constructed outside of such areas). Inclusion of sensitive areas within an SEZ would in practice allow the BLM to identify a block of land for solar energy development, instead of fragmented land pieces.

Design features and/or mitigation measures may also be effective in minimizing potential resource impacts in new SEZs. In the future the BLM would require implementing the design features of its Solar Energy Program (currently described in Appendix A of the Draft Solar PEIS) in new SEZs. These design features would adequately mitigate many resource-specific impacts that could be associated with solar development. The BLM will identify and analyze additional design features and/or mitigation measures particular to new SEZs as necessary through its planning and NEPA processes. The BLM will also develop regional mitigation plans for SEZs to the extent practicable to more effectively facilitate future development.

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APPENDIX E:

UPDATE TO LAND USE PLAN AMENDMENTS

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APPENDIX E:

UPDATE TO LAND USE PLAN AMENDMENTS

Analyses conducted for the Solar Programmatic Environmental Impact Statement (PEIS) will support the amendment of U.S. Department of the Interior Bureau of Land Management (BLM) land use plans in the six-state study area. In response to comments received on the Draft Solar PEIS, the BLM has modified its proposed action alternatives (see Section 2.2 of this Supplement). Consequently, the proposed land use plan amendments (previously presented in Appendix C of the Draft Solar PEIS) also will change.

Under the BLM's modified action alternatives presented in Section 2.2 of this Supplement, the BLM anticipates making the following land use plan decisions that will establish the foundation for a comprehensive Solar Energy Program:

1. Land use plan amendments that identify exclusion areas for utility-scale solar energy development in the six-state study area;

2. Land use plan amendments that identify priority areas for solar energy development that are best suited for utility-scale production of solar energy (i.e., solar energy zones [SEZs]);

3. Land use plan amendments that identify variance areas for utility-scale solar energy development in the six-state study area; and

4. Land use plan amendments that establish design features (i.e., mitigation requirements) for solar energy development on public lands to ensure the most environmentally responsible development and delivery of solar energy (some may be SEZ-specific, as necessary).

Table E-1 lists all of the land use plans in the six-state study area to be amended. Table E-1 also includes the acres proposed to be available in SEZs and variance areas for individual planning areas.

As discussed in the Draft Solar PEIS, land use plans that are undergoing revision or amendment concurrent with the Solar PEIS will be reviewed to identify and resolve inconsistencies between the PEIS and individual planning efforts.

TABLE E-1 Proposed Land Use Plans To Be Amended under BLM's Modified Action Alternatives and Proposed Acreage Available for Application for Solar Energy Development by Planning Area[a]

Plan/BLM Office	Modified Program Alternative – Approximate Proposed Acreage in Variance Areas[b]	Modified SEZ Alternative – Proposed Developable Acreage in SEZs
Arizona[c]		
Agua Fria NM Plan, Hassayampa Field Office	All lands would be excluded.	None
Arizona Strip RMP, Arizona Strip Field Office	739,340 acres	None
Bradshaw–Harquahala RMP, Hassayampa Field Office	185,930 acres	None
Grand Canyon–Parashant NM Plan, Arizona Strip Field Office	All lands would be excluded.	None
Gila Box Riparian NCA Plan, Safford Field Office	11 acres	None
Goldwater Range RMP, Lower Sonoran Field Office	71 acres	None
Kingman R.A. RMP, Kingman Field Office	662,508 acres	None
Lake Havasu RMP, Lake Havasu Field Office	506,076 acres	Brenda SEZ (3,847 acres)
Las Cienegas NCA Plan, Tucson Field Office	All lands would be excluded.	None
Lower Gila North and South RMP Amendment, Lower Sonoran Field Office	295,867 acres	Gillespie SEZ (2,618 acres)
Phoenix R.A. RMP, Lower Sonoran, Safford, and Tucson Field Offices	249,572 acres	None
Safford RMP, Safford, and Tucson Field Offices	613,467 acres	None
San Pedro Riparian NCA Plan, Tucson Field Office	143 acres	None

TABLE E-1 (Cont.)

Plan/BLM Office	Modified Program Alternative – Approximate Proposed Acreage in Variance Areas[b]	Modified SEZ Alternative – Proposed Developable Acreage in SEZs
Arizona (Cont.)		
Vermilion Cliffs NM Plan, Arizona Strip Field Office	All lands would be excluded.	None
Yuma RMP, Yuma Field Office	144,015 acres	None
California[c]		
Alturas RMP, Alturas Field Office	All lands would be excluded.	None
Arcata RMP, Arcata Field Office	All lands would be excluded.	None
Bishop RMP, Bishop Field Office	31,581 acres	None
Caliente RMP, Bakersfield Field Office	1,506 acres	None
California Coastal NM Plan, California State Office	All lands would be excluded.	None
California Desert Conservation Area RMP, Barstow, El Centro, Needles, Palm Springs–South Coast, and Ridgecrest Field Offices[d]	1,318,894 acres	Imperial East SEZ (5,717 acres) Riverside East SEZ (147,910 acres)
Carrizo Plain NM Plan, Bakersfield Field Office	All lands would be excluded.	None
Eagle Lake RMP, Eagle Lake Field Office	11 acres	None
Eastern San Diego RMP, El Centro Field Office	293 acres	None
Headwaters Forest Reserve Plan, Arcata Field Office	All lands would be excluded.	None
Hollister RMP, Hollister Field Office	All lands would be excluded.	None
King Range NCA Plan, Arcata Field Office	All lands would be excluded.	None

TABLE E-1 (Cont.)

Plan/BLM Office	Modified Program Alternative – Approximate Proposed Acreage in Variance Areas[b]	Modified SEZ Alternative – Proposed Developable Acreage in SEZs
California[c] (Cont.)		
Piedras Blancas Historic Light Station ONA Plan, Bakersfield Field Office	All lands would be excluded.	None
Redding RMP, Redding Field Office	All lands would be excluded.	None
Santa Rosa and San Jacinto Mountains NM Plan, Palm Springs–South Coast Field Office	All lands would be excluded.	None
South Coast RMP, Palm Springs–South Coast Field Office	2,273 acres	None
Surprise RMP, Surprise Field Office	All lands would be excluded.	None
Ukiah RMP, Ukiah Field Office	All lands would be excluded.	None
Colorado[c]		
Canyon of the Ancients NM Plan, Canyon of the Ancients NM	All lands would be excluded.	None
Glenwood Springs RMP, Glenwood Springs Field Office	All lands would be excluded.	None
Grand Junction RMP, Grand Junction Field Office	All lands would be excluded.	None
Gunnison RMP, Gunnison Field Office	3,162 acres	None
Gunnison Gorge NCA Plan, Gunnison Field Office	All lands would be excluded.	None
Kremmling RMP, Kremmling Field Office	All lands would be excluded.	None
Little Snake RMP, Little Snake Field Office	All lands would be excluded.	None
McInnis Canyons NCA Plan, Grand Junction Field Office	All lands would be excluded.	None

TABLE E-1 (Cont.)

Plan/BLM Office	Modified Program Alternative – Approximate Proposed Acreage in Variance Areas[b]	Modified SEZ Alternative – Proposed Developable Acreage in SEZs
Colorado[c] (Cont.)		
Royal Gorge/Northeast RMP, Royal Gorge Field Office	29,477 acres	None
San Juan Public Lands Center RMP, Columbine, Dolores, Pagosa Springs, and Uncompahgre Field Offices	16,535 acres	None
San Luis Valley Public Lands Center RMP, Del Norte, La Jara, and Saguache Field Offices	61,885 acres	Antonito Southeast SEZ (9,712 acres) La Jara Field Office De Tilla Gulch SEZ (1,064 acres) Saguache Field Office Fourmile East SEZ (2,882 acres) La Jara Field Office Los Mogotes East SEZ (2,650 acres) La Jara Field Office
Uncompahgre RMP, Uncompahgre Field Office	All lands would be excluded.	None
White River RMP, White River Field Office	All lands would be excluded.	None
Nevada[c]		
Black Rock Desert—High Rock Canyon Emigrant Trails NCA Plan Winnemucca District Office	All lands would be excluded.	None
Carson City Consolidated RMP, Carson City District	918,161 acres	None
U.S. Department of Energy Plan, Southern Nevada District Office[e]	All lands would be excluded.	None

TABLE E-1 (Cont.)

Plan/BLM Office	Modified Program Alternative – Approximate Proposed Acreage in Variance Areas[b]	Modified SEZ Alternative – Proposed Developable Acreage in SEZs
Nevada[c] (Cont.)		
Elko RMP, Elko District Office	All lands would be excluded.	None
Ely RMP, Ely District Office	3,344,963 acres	Dry Lake Valley North SEZ (25,069 acres)
Las Vegas RMP, Southern Nevada District Office	1,004,660 acres	Amargosa Valley SEZ 8,479 acres) Dry Lake SEZ (5,717 acres)
Nellis Non-renewal Area Plan, Southern Nevada District Office[e]	All lands would be excluded.	None
Nellis Test & Training Range RMP, Southern Nevada District Office[e]	All lands would be excluded.	None
Paradise-Denio RMP, Winnemucca District Office	All lands would be excluded.	None
Red Rock Canyon NCA Plan, Southern Nevada District Office	183 acres	None
Shoshone–Eureka RMP, Battle Mountain District Office	663,198 acres	None
Sloan Canyon NCA Plan, Southern Nevada District Office	17 acres	None
Sonoma–Gerlach RMP, Winnemucca District Office	85,771 acres	None
Tonopah RMP, Battle Mountain District Office	3,190,335 acres	Gold Point SEZ (4,596 acres) Millers SEZ (16,534 acres)

TABLE E-1 (Cont.)

Plan/BLM Office	Modified Program Alternative – Approximate Proposed Acreage in Variance Areas[b]	Modified SEZ Alternative – Proposed Developable Acreage in SEZs
Nevada[c] (Cont.)		
Wells RMP, Elko District Office	All lands would be excluded.	None
New Mexico[c]		
Carlsbad RMP, Carlsbad Field Office	271,504 acres	None
El Malpais NCA Plan, Rio Puerco Field Office	64 acres	None
Farmington RMP, Farmington Field Office	411,883 acres	None
Kasha-Katuwe Tent Rocks NM Plan, Rio Puerco Field Office	All lands would be excluded.	None
McGregor Range RMP, Las Cruces District Office	All lands would be excluded.	None
Mimbres RMP, Las Cruces District Office	1,422,603 acres	Afton SEZ (29,964 acres)
Rio Grande Corridor	34 acres	None
Rio Puerco RMP, Rio Puerco Field Office	320,387 acres	None
Roswell RMP, Roswell Field Office	759,743 acres	None
Socorro RMP, Socorro Field Office	656,335 acres	None
Taos RMP, Taos Field Office	24,191 acres	None
White Sands RMP, Las Cruces District Office	425,535 acres	None

TABLE E-1 (Cont.)

Plan/BLM Office	Modified Program Alternative – Approximate Proposed Acreage in Variance Areas[b]	Modified SEZ Alternative – Proposed Developable Acreage in SEZs
Utah[c]		
Box Elder RMP, Salt Lake City Field Office[f]	All lands would be excluded.	None
Cedar-Beaver-Garfield-Antimony RMP, Cedar City Field Office	180,801 acres	Escalante Valley SEZ (6,533 acres) Milford Flats South SEZ (6,252 acres)
Grand Staircase–Escalante NM Plan, Grand Staircase–Escalante NM	8 acres	None
House Range RMP, Fillmore Field Office[f]	213,111 acres (all inside the UTTR)	None
Kanab RMP, Kanab Field Office	18,633 acres	None
Moab RMP, Moab Field Office	1,320 acres	None
Monticello RMP, Monticello Field Office	123,712 acres	None
Park City MFP, Salt Lake City Field Office	All lands would be excluded.	None
Pinyon MFP, Cedar City Field Office[f]	476,312 acres (469,187 acres outside the UTTR) (7,125 acres inside the UTTR)	Wah Wah Valley SEZ (5,873 acres)
Pony Express RMP, Salt Lake City Field Office[f]	All lands would be excluded.	None
Price RMP, Price Field Office	26 acres	None
Randolf MFP, Salt Lake City Field Office	All lands would be excluded.	None

TABLE E-1 (Cont.)

Plan/BLM Office	Modified Program Alternative – Approximate Proposed Acreage in Variance Areas[b]	Modified SEZ Alternative – Proposed Developable Acreage in SEZs
Utah[c] (Cont.)		
Richfield RMP, Richfield Field Office	134,372 acres	None
St. George RMP, St. George Field Office	9,402 acres	None
Vernal RMP, Vernal Field Office	All lands would be excluded.	None
Warm Springs RMP, Fillmore Field Office[f]	804,974 acres (200,372 acres outside the UTTR) (604,603 acres inside the UTTR)	None

Abbreviations: MFP = Management Framework Plan; NCA = National Conservation Area; NM = National Monument; ONA = Outstanding Natural Area; RMP = Resource Management Plan; SEZ = solar energy zone; UTTR = Utah Test and Training Range.

[a] Land use plan amendments for the modified program alternative would include the identification of SEZs and the identification of variance areas; all remaining lands would be identified as exclusion areas. Note that acreage in some plan areas has increased from that presented in the Draft Solar PEIS because areas less than 247 acres (1 km^2) have been added. Land use plan amendments for the modified SEZ alternative would include the identification of SEZs; all remaining lands would be identified as exclusion areas. Totals may be off due to rounding. This table lists plans as of August 2010; the list of plans and acres affected will be updated for the Final Solar PEIS.

[b] These acreage estimates include the acreage in the proposed SEZs. The estimates were calculated on the basis of the best available geographic information system (GIS) data. GIS data were not available for the entire set of exclusions; thus the exact acreage could not be calculated. Exclusion areas that could not be mapped because of the lack of data would be identified during pre-application consultations with local BLM staff or site-specific evaluation of individual ROW applications.

[c] For state totals, refer to Table 2.3-1 of this Supplement. Minor inconsistencies with GIS data for land use plan boundaries will be resolved for the Final Solar PEIS.

[d] Currently, the California Desert Conservation Area (CDCA) RMP requires a plan amendment for individual energy projects; the amendment to this plan pursuant to the Solar PEIS Record of Decision (ROD) would remove this requirement for individual plan amendments for utility-scale solar energy projects in SEZs. The requirement would remain for projects proposed in variance areas.

Footnotes continued on next page.

TABLE E-1 (Cont.)

[e] Public lands in these planning areas in Nevada have been temporarily withdrawn for use by another federal agency.

[f] Section 2815(d) of the National Defense Authorization Act (NDAA) for fiscal year 2000 (P.L. 106-65) placed a moratorium on planning efforts on BLM-administered lands ~~a~~adjacent to, or near the Utah Test and Training Range (UTTR) and Dugway Proving Grounds or beneath Military Operating Areas, Restricted Areas, and airspace that make up the UTTR," NDAA § 2815(a), 113 Stat. 512, 852 (1999). This area encompasses a portion of the lands within the boundaries of the Box Elder, Pony Express, House Range, Warm Springs, and Pinyon land use plans. Within these areas, decisions related to whether lands would be available for ROW application, and adoption of the policies and design features of the PEIS, cannot be implemented via land use plan amendments at this time. Solar energy development ROW applications would be deferred until such time plan amendments or new land use plan(s) address solar energy development. No SEZs are located within the UTTR affected areas.