NOTATION

The following is a list of acronyms and abbreviations, chemical names, 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

AADT	annual average daily traffic
AASHTO	American Association of State Highway and Transportation Officials
AC	alternating current
ACC	air-cooled condenser
ACEC	Area of Critical Environmental Concern
ADEQ	Arizona Department of Environmental Quality
ACHP	Advisory Council on Historic Preservation
ADOT	Arizona Department of Transportation
ADWR	Arizona Department of Water Resources
AERMOD	AMS/EPA Regulatory Model
AFC	Application for Certification
AGL	above ground level
AIM	Assessment, Inventory and Monitoring
AIRFA	American Indian Religious Freedom Act
AMA	active management area
AML	animal management level
ANHP	Arizona National Heritage Program
APE	area of potential effect
APLIC	Avian Power Line Interaction Committee
APP	Avian Protection Plan
APS	Arizona Public Service
AQCR	Air Quality Control Region
AQRV	air quality–related value
ARB	Air Resources Board
ARRA	American Recovery and Reinvestment Act of 2009
ARRTIS	Arizona Renewable Resource and Transmission Identification Subcommittee
ARS	Agricultural Research Service
ARZC	Arizona and California
ATSDR	Agency for Toxic Substances and Disease Registry
AUM	animal unit month
AVSE	Arlington Valley Solar Energy
AVWS	Audio Visual Warning System
AWBA	Arizona Water Banking Authority
AWEA	American Wind Energy Association
AWRM	Active Water Resource Management
AZDA	Arizona Department of Agriculture
AZGFD	Arizona Game and Fish Department

AZGS	Arizona Geological Survey
BA	biological assessment
BAP	base annual production
BEA	Bureau of Economic Analysis
BISON-M	Biota Information System of New Mexico
BLM	Bureau of Land Management
BLM-CA	Bureau of Land Management, California
BMP	best management practice
BNSF	Burlington Northern Santa Fe
BO	biological opinion
BOR	U.S. Bureau of Reclamation
BPA	Bonneville Power Administration
BRAC	Blue Ribbon Advisory Council on Climate Change
BSE	Beacon Solar Energy
BSEP	Beacon Solar Energy Project
BTS	Bureau of Transportation Statistics
CAA	Clean Air Act
CAAQS	California Air Quality Standards
CAISO	California Independent System Operator
Caltrans	California Department of Transportation
C-AMA	California-Arizona Maneuver Area
CAP	Central Arizona Project
CARB	California Air Resources Board
CAReGAP	California Regional Gap Analysis Project
CASQA	California Stormwater Quality Association
CASTNET	Clean Air Status and Trends NETwork
CAWA	Colorado Agricultural Water Alliance
CCC	Civilian Conservation Corps
CDC	Centers for Disease Control and Prevention
CDCA	California Desert Conservation Area
CDFG	California Department of Fish and Game
CDNCA	California Desert National Conservation Area
CDOT	Colorado Department of Transportation
CDOW	Colorado Division of Wildlife (now Colorado Parks and Wildlife)
CDPHE	Colorado Department of Public Health and Environment
CDWR	California Department of Water Resources
CEC	California Energy Commission
CEQ	Council on Environmental Quality
CES	constant elasticity of substitution
CESA	California Endangered Species Act
CESF	Carrizo Energy Solar Farm
CFR	*Code of Federal Regulations*
CGE	computable general equilibrium
CHAT	crucial habitat assessment tool

CIRA	Cooperative Institute for Research in the Atmosphere
CLFR	compact linear Fresnel reflector
CNDDB	California Natural Diversity Database
CNEL	community noise equivalent level
CNHP	Colorado National Heritage Program
Colorado DWR	Colorado Division of Water Resources
CO_2e	carbon dioxide equivalent
CPC	Center for Plant Conservation
CPUC	California Public Utilities Commission
CPV	concentrating photovoltaic
CRBSCF	Colorado River Basin Salinity Control Forum
CREZ	competitive renewable energy zone
CRPC	Cultural Resources Preservation Council
CRSCP	Colorado River Salinity Control Program
CSA	Candidate Study Area
CSC	Coastal Services Center
CSFG	carbon-sequestration fossil generation
CSP	concentrating solar power
CSQA	California Stormwater Quality Association
CSRI	Cultural Systems Research, Incorporated
CTG	combustion turbine generator
CTPG	California Transmission Planning Group
CTSR	Cumbres & Toltec Scenic Railroad
CUP	Conditional Use Permit
CVP	Central Valley Project
CWA	Clean Water Act
CWCB	Colorado Water Conservation Board
CWHRS	California Wildlife Habitat Relationship System
DC	direct current
DEM	digital elevation model
DHS	U.S. Department of Homeland Security
DIMA	Database for Inventory, Monitoring and Assessment
DLT	dedicated-line transmission
DNA	Determination of NEPA Adequacy
DNI	direct normal insulation
DNL	day-night average sound level
DoD	U.S. Department of Defense
DOE	U.S. Department of Energy
DOI	U.S. Department of the Interior
DOL	U.S. Department of Labor
DOT	U.S. Department of Transportation
DRECP	California Desert Renewable Energy Conservation Plan
DSM	demand-side management
DSRP	Decommissioning and Site Reclamation Plan
DTC/C-AMA	Desert Training Center/California–Arizona Maneuver Area

DWMA	Desert Wildlife Management Area
DWR	Division of Water Resources
EA	environmental assessment
EBID	Elephant Butte Irrigation District
ECAR	East Central Area Reliability Coordination Agreement
ECOS	Environmental Conservation Online System (USFWS)
EERE	Energy Efficiency and Renewable Energy (DOE)
Eg	band gap energy
EIA	Energy Information Administration (DOE)
EIS	environmental impact statement
EISA	Energy Independence and Security Act of 2007
EMF	electromagnetic field
E.O.	Executive Order
EPA	U.S. Environmental Protection Agency
EPRI	Electric Power Research Institute
EQIP	Environmental Quality Incentives Program
ERCOT	Electric Reliability Council of Texas
ERO	Electric Reliability Organization
ERS	Economic Research Service
ESA	Endangered Species Act of 1973
ESRI	Environmental Systems Research Institute
FAA	Federal Aviation Administration
FBI	Federal Bureau of Investigation
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
FLPMA	Federal Land Policy and Management Act of 1976
FONSI	Finding of No Significant Impact
FR	*Federal Register*
FRCC	Florida Reliability Coordinating Council
FSA	Final Staff Assessment
FTE	full-time equivalent
FY	fiscal year
G&TM	generation and transmission modeling
GCRP	U.S. Global Climate Research Program
GDA	generation development area
GHG	greenhouse gas
GIS	geographic information system
GMU	game management unit
GPS	global positioning system
GTM	Generation and Transmission Model

GUAC	Groundwater Users Advisory Council
GWP	global warming potential
HA	herd area
HAP	hazardous air pollutant
HAZCOM	hazard communication
HCE	heat collection element
HCP	Habitat Conservation Plan
HMA	herd management area
HMMH	Harris Miller Miller & Hanson, Inc.
HRSG	heat recovery steam generator
HSPD	Homeland Security Presidential Directive
HTF	heat transfer fluid
HUC	hydrologic unit code
HVAC	heating, ventilation, and air-conditioning
I	Interstate
IARC	International Agency for Research on Cancer
IBA	important bird area
ICE	internal combustion engine
ICPDS	Imperial County Planning & Development Services
ICWMA	Imperial County Weed Management Area
IDT	interdisplinary team
IEC	International Electrochemical Commission
IFR	instrument flight rule
IID	Imperial Irrigation District
IM	Instruction Memorandum
IMPS	Iron Mountain Pumping Station
IMS	interim mitigation strategy
INA	Irrigation Non-Expansion Area
IOP	Interagency Operating Procedure
IOU	investor-owned utility
IPCC	Intergovernmental Panel on Climate Change
ISA	Independent Science Advisor; Instant Study Area
ISB	Intermontane Seismic Belt
ISCC	integrated solar combined cycle
ISDRA	Imperial Sand Dunes Recreation Area
ISEGS	Ivanpah Solar Energy Generating System
ISO	independent system operator; iterative self-organizing
ITFR	Interim Temporary Final Rulemaking
ITP	incidental take permit
IUCNNR	International Union for Conservation of Nature and Natural Resources
IUCNP	International Union for Conservation of Nature Pakistan
KGA	known geothermal resources area
KML	keyhole markup language

KOP	key observation point
KSLA	known sodium leasing area
LCC	Landscape Conservation Cooperative
LCCRDA	Lincoln County Conservation, Recreation, and Development Act of 2004
LCOE	levelized cost of energy
L_{dn}	day-night average sound level
LDWMA	Low Desert Weed Management Area
L_{eq}	equivalent sound pressure level
LiDAR	light detection and ranging
LLA	limited land available
LLRW	low-level radioactive waste (waste classification)
LPN	listing priority number
LRG	Lower Rio Grande
LSA	lake and streambed alteration
LSE	load-serving entity
LTMP	long-term monitoring and adaptive management plan
LTVA	long-term visitor area
MAAC	Mid-Atlantic Area Council
MAIN	Mid-Atlantic Interconnected Network
MAPP	methyl acetylene propadiene stabilizer; Mid-Continent Area Power Pool
MCAS	Marine Corps Air Station
MCL	maximum contaminant level
MEB	Marine Expeditionary Brigade
MFP	Management Framework Plan
MIG	Minnesota IMPLAN Group
MLA	maximum land available
MOA	military operating area
MOU	Memorandum of Understanding
MPDS	maximum potential development scenario
MRA	Multiple Resource Area
MRI	Midwest Research Institute
MRO	Midwest Reliability Organization
MSDS	Material Safety Data Sheet
MSL	mean sea level
MTR	military training route
MVEDA	Mesilla Valley Economic Development Alliance
MWA	Mojave Water Agency
MWD	Metropolitan Water District
MWMA	Mojave Weed Management Area
NAAQS	National Ambient Air Quality Standard(s)
NADP	National Atmospheric Deposition Program
NAGPRA	Native American Graves Protection and Repatriation Act
NAHC	Native American Heritage Commission (California)
NAIC	North American Industrial Classification System

NASA	National Aeronautics and Space Administration
NCA	National Conservation Area
NCCAC	Nevada Climate Change Advisory Committee
NCDC	National Climatic Data Center
NCES	National Center for Education Statistics
NDAA	National Defense Authorization Act
NDCNR	Nevada Department of Conservation and Natural Resources
NDEP	Nevada Division of Environmental Protection
NDOT	Nevada Department of Transportation
NDOW	Nevada Department of Wildlife
NDWP	Nevada Division of Water Planning
NDWR	Nevada Division of Water Resources
NEAP	Natural Events Action Plan
NEC	National Electric Code
NED	National Elevation Database
NEP	Natural Events Policy
NEPA	National Environmental Policy Act of 1969
NERC	North American Electricity Reliability Corporation
NGO	non-governmental organization
NHA	National Heritage Area
NHD	National Hydrography Dataset
NHNM	National Heritage New Mexico
NHPA	National Historic Preservation Act of 1966
NID	National Inventory of Dams
NLCS	National Landscape Conservation System
NMAC	*New Mexico Administrative Code*
NMBGMR	New Mexico Bureau of Geology and Mineral Resources
NMDGF	New Mexico Department of Game and Fish
NM DOT	New Mexico Department of Transportation
NMED	New Mexico Environment Department
NMED-AQB	New Mexico Environment Department-Air Quality Board
NMFS	National Marine Fisheries Service
NMOSE	New Mexico Office of the State Engineer
NMSU	New Mexico State University
NNHP	Nevada Natural Heritage Program
NNL	National Natural Landmark
NNSA	National Nuclear Security Administration
NOA	Notice of Availability
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NP	National Park
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NPS	National Park Service
NPV	net present value
NRA	National Recreation Area

NRCS	Natural Resources Conservation Service
NREL	National Renewable Energy Laboratory
NRHP	*National Register of Historic Places*
NRS	*Nevada Revised Statutes*
NSC	National Safety Council
NSO	no surface occupancy
NSTC	National Science and Technology Council
NTHP	National Trust for Historic Preservation
NTS	Nevada Test Site
NTTR	Nevada Test and Training Range
NVCRS	Nevada Cultural Resources Inventory System
NV DOT	Nevada Department of Transportation
NWCC	National Wind Coordinating Committee
NWI	National Wetlands Inventory
NWIS	National Water Information System (USGS)
NWPP	Northwest Power Pool
NWR	National Wildlife Refuge
NWSRS	National Wild and Scenic River System
O&M	operation and maintenance
ODFW	Oregon Department of Fish and Wildlife
OHV	off-highway vehicle
ONA	Outstanding Natural Area
ORC	organic Rankine cycle
OSE/ISC	Office of the State Engineer/Interstate Stream Commission
OSHA	Occupational Safety and Health Administration
OTA	Office of Technology Assessment
PA	Programmatic Agreement
PAD	Preliminary Application Document
PAH	polycyclic aromatic hydrocarbon
PAT	peer analysis tool
PCB	polychlorinated biphenyl
PCM	purchase change material
PCS	power conditioning system
PCU	power converting unit
PEIS	programmatic environmental impact statement
PFYC	potential fossil yield classification
PGH	Preliminary General Habitat
PIER	Public Interest Energy Research
P.L.	Public Law
PLSS	Public Land Survey System
PM	particulate matter
$PM_{2.5}$	particulate matter with a diameter of 2.5 μm or less
PM_{10}	particulate matter with a diameter of 10 μm or less
PPA	Power Purchase Agreement

P-P-D	population-to-power density
PPH	Preliminary Priority Habitat
POD	plan of development
POU	publicly owned utility
PPA	Power Purchase Agreement
PPE	personal protective equipment
PSD	Prevention of Significant Deterioration
PURPA	Public Utility Regulatory Policy Act
PV	photovoltaic
PVID	Palo Verde Irrigation District
PWR	public water reserve
QRA	qualified resource area
R&I	relevance and importance
RAC	Resource Advisory Council
RCE	Reclamation Cost Estimate
RCI	residential, commercial, and industrial (sector)
RCRA	Resource Conservation and Recovery Act of 1976
RD&D	research, development, and demonstration; research, development, and deployment
RDBMS	Relational Database Management System
RDEP	Restoration Design Energy Project
REA	Rapid Ecoregional Assessment
REAT	Renewable Energy Action Team
REDA	Renewable Energy Development Area
REDI	Renewable Energy Development Infrastructure
REEA	Renewable Energy Evaluation Area
ReEDS	Regional Energy Deployment System
REPG	Renewable Energy Policy Group
RETA	Renewable Energy Transmission Authority
RETAAC	Renewable Energy Transmission Access Advisory Committee
RETI	Renewable Energy Transmission Initiative
REZ	renewable energy zone
RF	radio frequency
RFC	Reliability First Corporation
RFDS	reasonably foreseeable development scenario
RGP	Rio Grande Project
RGWCD	Rio Grande Water Conservation District
RMP	Resource Management Plan
RMPA	Rocky Mountain Power Area
RMZ	Resource Management Zone
ROD	Record of Decision
ROI	region of influence
ROS	recreation opportunity spectrum
ROW	right-of-way

RPG	renewable portfolio goal
RPS	Renewable Portfolio Standard
RRC	Regional Reliability Council
RSEP	Rice Solar Energy Project
RSI	Renewable Systems Interconnection
RTO	regional transmission organization
RTTF	Renewable Transmission Task Force
RV	recreational vehicle
SAAQS	State Ambient Air Quality Standard(s)
SAMHSA	Substance Abuse and Mental Health Services Administration
SCADA	supervisory control and data acquisition
SCE	Southern California Edison
SCRMA	Special Cultural Resource Management Area
SDRREG	San Diego Regional Renewable Energy Group
SDWA	Safe Drinking Water Act of 1974
SEGIS	Solar Energy Grid Integration System
SEGS	Solar Energy Generating System
SEI	Sustainable Energy Ireland
SEIA	Solar Energy Industrial Association
SES	Stirling Energy Systems
SETP	Solar Energy Technologies Program (DOE)
SEZ	solar energy zone
SHPO	State Historic Preservation Office(r)
SIP	State Implementation Plan
SLRG	San Luis & Rio Grande
SMA	Special Management Area
SMART	specific, measurable, achievable, relevant, and time sensitive
SMP	suggested management practice
SNWA	Southern Nevada Water Authority
SPP	Southwest Power Pool
SRMA	Special Recreation Management Area
SSA	Socorro Seismic Anomaly
SSI	self-supplied industry
ST	solar thermal
STG	steam turbine generator
SUA	special use airspace
SWAT	Southwest Area Transmission
SWIP	Southwest Intertie Project
SWPPP	Stormwater Pollution Prevention Plan
SWReGAP	Southwest Regional Gap Analysis Project
TAP	toxic air pollutant
TCC	Transmission Corridor Committee
TDS	total dissolved solids
TEPPC	Transmission Expansion Planning Policy Committee

TES	thermal energy storage
TRACE	Transmission Routing and Configuration Estimator
TSA	Transportation Security Administration
TSCA	Toxic Substances Control Act of 1976
TSDF	treatment, storage, and disposal facility
TSP	total suspended particulates
UACD	Utah Association of Conservation Districts
UBWR	Utah Board of Water Resources
UDA	Utah Department of Agriculture
UDEQ	Utah Department of Environmental Quality
UDNR	Utah Department of Natural Resources
UDOT	Utah Department of Transportation
UDWQ	Utah Division of Water Quality
UDWR	Utah Division of Wildlife Resources
UGS	Utah Geological Survey
UNEP	United Nations Environmental Programme
UNPS	Utah Native Plant Society
UP	Union Pacific
UREZ	Utah Renewable Energy Zone
USACE	U.S. Army Corps of Engineers
USAF	U.S. Air Force
USC	*United States Code*
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
Utah DWR	Utah Division of Water Rights
UTTR	Utah Test and Training Range
UWS	Underground Water Storage, Savings and Replenishment Act
VACAR	Virginia–Carolinas Subregion
VCRS	Visual Contrast Rating System
VFR	visual flight rule
VOC	volatile organic compound
VRHCRP	Virgin River Habitat Conservation & Recovery Program
VRI	Visual Resource Inventory
VRM	Visual Resource Management
WA	Wilderness Area
WECC	Western Electricity Coordinating Council
WECC CAN	Western Electricity Coordinating Council–Canada
WEG	wind erodibility group
Western	Western Area Power Administration
WGA	Western Governors' Association
WGFD	Wyoming Game and Fish Department

WHA	wildlife habitat area
WHO	World Health Organization
WIA	Wyoming Infrastructure Authority
WRAP	Water Resources Allocation Program; Western Regional Air Partnership
WRCC	Western Regional Climate Center
WREZ	Western Renewable Energy Zones
WRRI	Water Resources Research Institute
WSA	Wilderness Study Area
WSC	wildlife species of special concern
WSMR	White Sands Missile Range
WSR	Wild and Scenic River
WSRA	Wild and Scenic Rivers Act of 1968
WWII	World War II
WWP	Western Watersheds Project
YPG	Yuma Proving Ground
ZITA	zone identification and technical analysis
ZLD	zero liquid discharge

CHEMICALS

CH_4	methane	NO_2	nitrogen dioxide
CO	carbon monoxide	NO_x	nitrogen oxides
CO_2	carbon dioxide		
		O_3	ozone
H_2S	hydrogen sulfide		
Hg	mercury	Pb	lead
N_2O	nitrous oxide	SF_6	sulfur hexafluoride
NH_3	ammonia	SO_2	sulfur dioxide
		SO_x	sulfur oxides

UNITS OF MEASURE

ac-ft	acre-foot (feet)	dBA	A-weighted decibel(s)
bhp	brake horsepower		
		°F	degree(s) Fahrenheit
°C	degree(s) Celsius	ft	foot (feet)
cf	cubic foot (feet)	ft^2	square foot (feet)
cfs	cubic foot (feet) per second	ft^3	cubic foot (feet)
cm	centimeter(s)		
		g	gram(s)
dB	decibel(s)	gal	gallon(s)

GJ	gigajoule(s)
gpcd	gallon per capita per day
gpd	gallon(s) per day
gpm	gallon(s) per minute
GW	gigawatt(s)
GWh	gigawatt hour(s)
GWh/yr	gigawatt hour(s) per year
h	hour(s)
ha	hectare(s)
Hz	hertz
in.	inch(es)
J	joule(s)
K	degree(s) Kelvin
kcal	kilocalorie(s)
kg	kilogram(s)
kHz	kilohertz
km	kilometer(s)
km^2	square kilometer(s)
kPa	kilopascal(s)
kV	kilovolt(s)
kVA	kilovolt-ampere(s)
kW	kilowatt(s)
kWh	kilowatt-hour(s)
kWp	kilowatt peak
L	liter(s)
lb	pound(s)
m	meter(s)
m^2	square meter(s)
m^3	cubic meter(s)
mg	milligram(s)
Mgal	million gallons
mi	mile(s)
mi^2	square mile(s)
min	minute(s)
mm	millimeter(s)
MMt	million metric ton(s)
MPa	megapascal(s)
mph	mile(s) per hour
MVA	megavolt-ampere(s)
MW	megawatt(s)
MWe	megawatt(s) electric
MWh	megawatt-hour(s)
ppm	part(s) per million
psi	pound(s) per square inch
psia	pound(s) per square inch absolute
rpm	rotation(s) per minute
s	second(s)
scf	standard cubic foot (feet)
TWh	terawatt hour(s)
VdB	vibration velocity decibel(s)
W	watt(s)
yd^2	square yard(s)
yd^3	cubic yard(s)
yr	year(s)
µg	microgram(s)
µm	micrometer(s)

11 UPDATE TO AFFECTED ENVIRONMENT AND IMPACT ASSESSMENT FOR PROPOSED SOLAR ENERGY ZONES IN NEVADA

The U.S. Department of the Interior Bureau of Land Management (BLM) has carried 17 solar energy zones (SEZs) forward for analysis in this Final Solar Programmatic Environmental Impact Statement (PEIS). These SEZs total approximately 285,000 acres (1,153 km^2) of land potentially available for development. This chapter includes analyses of potential environmental impacts for the proposed SEZs in Nevada—Amargosa, Dry Lake, Dry Lake Valley North, Gold Point, and Millers—as well as summaries of the previously proposed Delamar Valley and East Mormon Mountain SEZs and why they were eliminated from further consideration. The SEZ-specific analyses provide documentation from which the BLM will tier future project authorizations, thereby limiting the required scope and effort of project-specific National Environmental Policy Act of 1969 (NEPA) analyses.

The BLM is committed to collecting additional SEZ-specific resource data and conducting additional analysis in order to more efficiently facilitate future development in SEZs. The BLM developed action plans for each of the 17 SEZs carried forward as part of the Supplement to the Draft Solar PEIS (BLM and DOE 2011). These action plans described additional data that could be collected for individual SEZs and proposed data sources and methods for the collection of those data. Work is underway to collect additional data as specified under these action plans (e.g., additional data collection to support evaluation of cultural, visual, and water resources has begun). As the data become available, they will be posted on the project Web site (http://solareis.anl.gov) for use by applicants and the BLM and other agency staff.

To accommodate the flexibility described in the BLM's program objectives and in light of anticipated changes in technologies and environmental conditions over time, the BLM has removed some of the prescriptive SEZ-specific design features presented in the Draft Solar PEIS (BLM and DOE 2010) and the Supplement to the Draft (e.g., height restrictions on technologies used to address visual resource impacts). Alternatively, the BLM will give full consideration to any outstanding conflicts in SEZs as part of the competitive process being developed through rulemaking (see Section 2.2.2.2.1).

In preparing selected parcels for competitive offer, the BLM will review all existing analysis for an SEZ and consider any new or changed circumstances that may affect the development of the SEZ. The BLM will also work with appropriate federal, state, and local agencies, and affected tribes, as necessary, to discuss SEZ-related issues. This work would ultimately inform how a parcel would be offered competitively (e.g., parcel size and configuration, technology limitations, mitigation requirements, and parcel-specific competitive process). Prior to issuing a notice of competitive offer, the BLM would complete appropriate NEPA analysis to support the offer. This analysis would tier to the analysis for SEZs in the Solar PEIS to the extent practicable.

It is the BLM's goal to compile all data, information, and analyses for SEZs from the Draft Solar PEIS, the Supplement to the Draft, and this Final Solar PEIS into a single location

accessible via the project Web site (http://solareis.anl.gov) for ease of use by applicants and the BLM and other agency staff.

This chapter is an update to the information on Nevada SEZs presented in the Draft Solar PEIS. As stated previously, the Delamar Valley and East Mormon SEZs were dropped from further consideration through the Supplement to the Draft Solar PEIS. For the remaining five Nevada SEZs—Amargosa, Dry Lake, Dry Lake Valley North, Gold Point, and Millers—the information presented in this chapter supplements and updates, but does not replace, the information provided in the corresponding Chapter 11 on proposed SEZs in Nevada in the Draft Solar PEIS. Corrections to incorrect information in Sections 11.1, 11.3, 11.4, 11.6, and 11.7 of the Draft Solar PEIS and in Sections C.4.1, C.4.2, C.4.3, C.4.4, and C.4.5 of the Supplement to the Draft are provided in Sections 11.1.26, 11.3.26, 11.4.26, 11.6.26, and 11.7.26 of this Final Solar PEIS.

11.3 DRY LAKE

11.3.1 Background and Summary of Impacts

11.3.1.1 General Information

The proposed Dry Lake SEZ is located in Clark County in southern Nevada. In 2008, the county population was 1,879,093. The towns of Moapa Town and Overton are as close as 18 mi (29 km) northeast and 23 mi (37 km) east of the SEZ, respectively. Nellis Air Force Base is located approximately 13 mi (21 km) southwest of the SEZ. The nearest major roads accessing the proposed Dry Lake SEZ are I-15, which passes along the southeastern boundary of the SEZ, and U.S. 93, which runs from northwest to southeast along part of the southwest border of the SEZ. The UP Railroad runs north to south along a portion of the eastern SEZ boundary, with the nearest stop in Las Vegas. As of October 28, 2011, there were three pending solar applications within or adjacent to the SEZ and an additional large application area located about 2 mi (3 km) to the east of the SEZ across I-15.

As published in the Draft Solar PEIS (BLM and DOE 2010), the proposed Dry Lake SEZ had a total area of 15,649 acres (63 km^2). In the Supplement to the Draft Solar PEIS (BLM and DOE 2011), the size of the SEZ was reduced, eliminating 9,463 acres (38 km^2) to include only the southernmost area that is northwest of I-15 (see Figure 11.3.1.1-1). Eliminating the northern portion of the SEZ is primarily intended to avoid or minimize some potential impacts from development in the SEZ, including impacts on desert tortoise and other wildlife and on military operations. In addition, 469 acres (1.9 km^2) of floodplain and wetland were identified as non-development areas. 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 ROW variance areas, because the BLM expects that individual projects could be sited in these areas to avoid and/or minimize impacts. Any solar development within these areas in the future would require appropriate environmental analysis.

The analyses in the following sections update the affected environment and potential environmental, cultural, and socioeconomic impacts associated with utility-scale solar energy development in the Dry Lake SEZ as described in the Draft Solar PEIS.

11.3.1.2 Development Assumptions for the Impact Analysis

Maximum solar development of the Dry Lake SEZ was assumed to be 80% of the developable SEZ area over a period of 20 years, a maximum of 4,574 acres (18.5 km^2) (see Figure 11.3.1.1-2). Full development of the Dry Lake SEZ would allow development of facilities with an estimated total of between 508 MW (power tower, dish engine, or PV technologies, 9 acres/MW [0.04 km^2/MW]) and 915 MW (solar trough technologies, 5 acres/MW [0.02 km^2/MW]) of electrical power capacity.

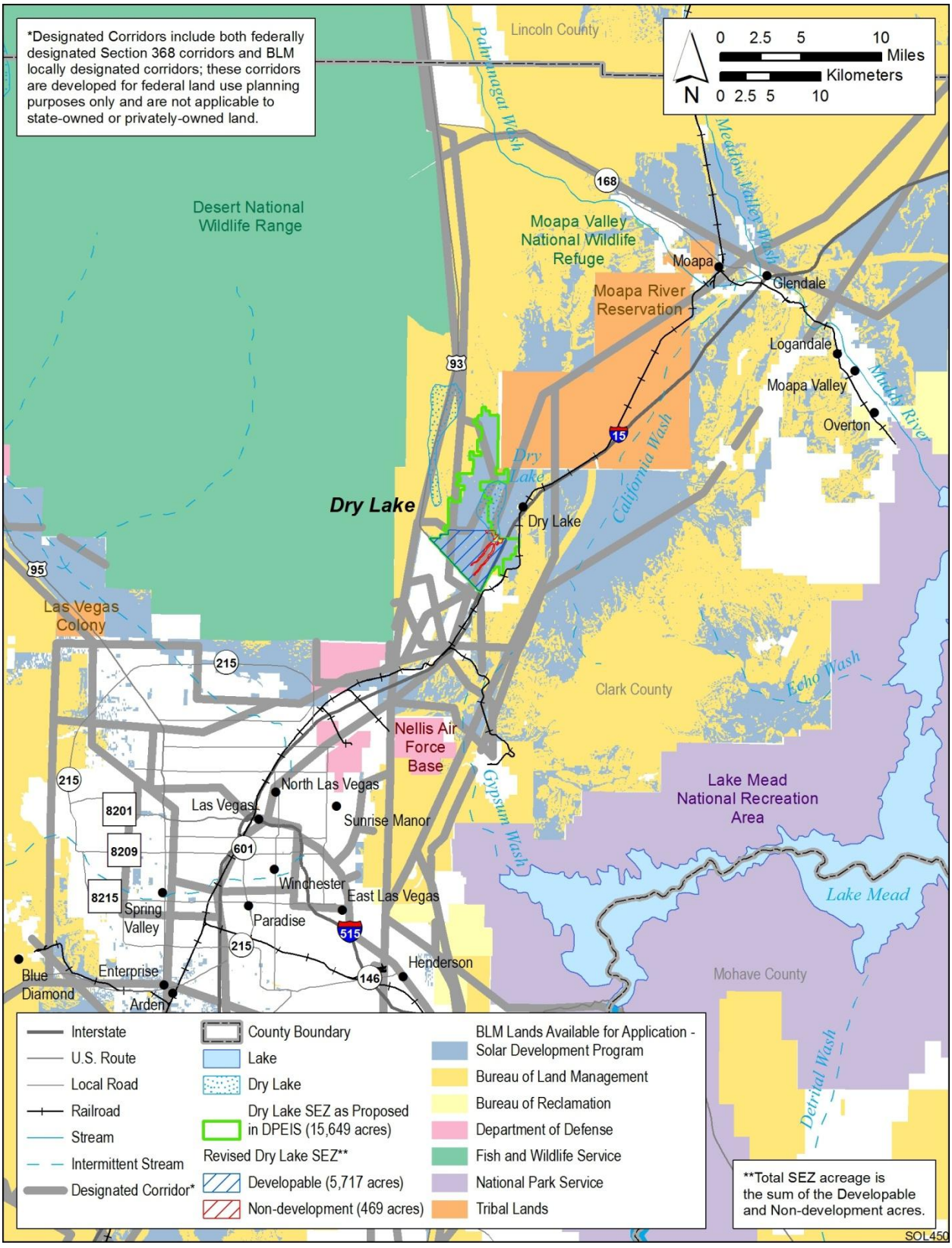

FIGURE 11.3.1.1-1 Proposed Dry Lake SEZ as Revised

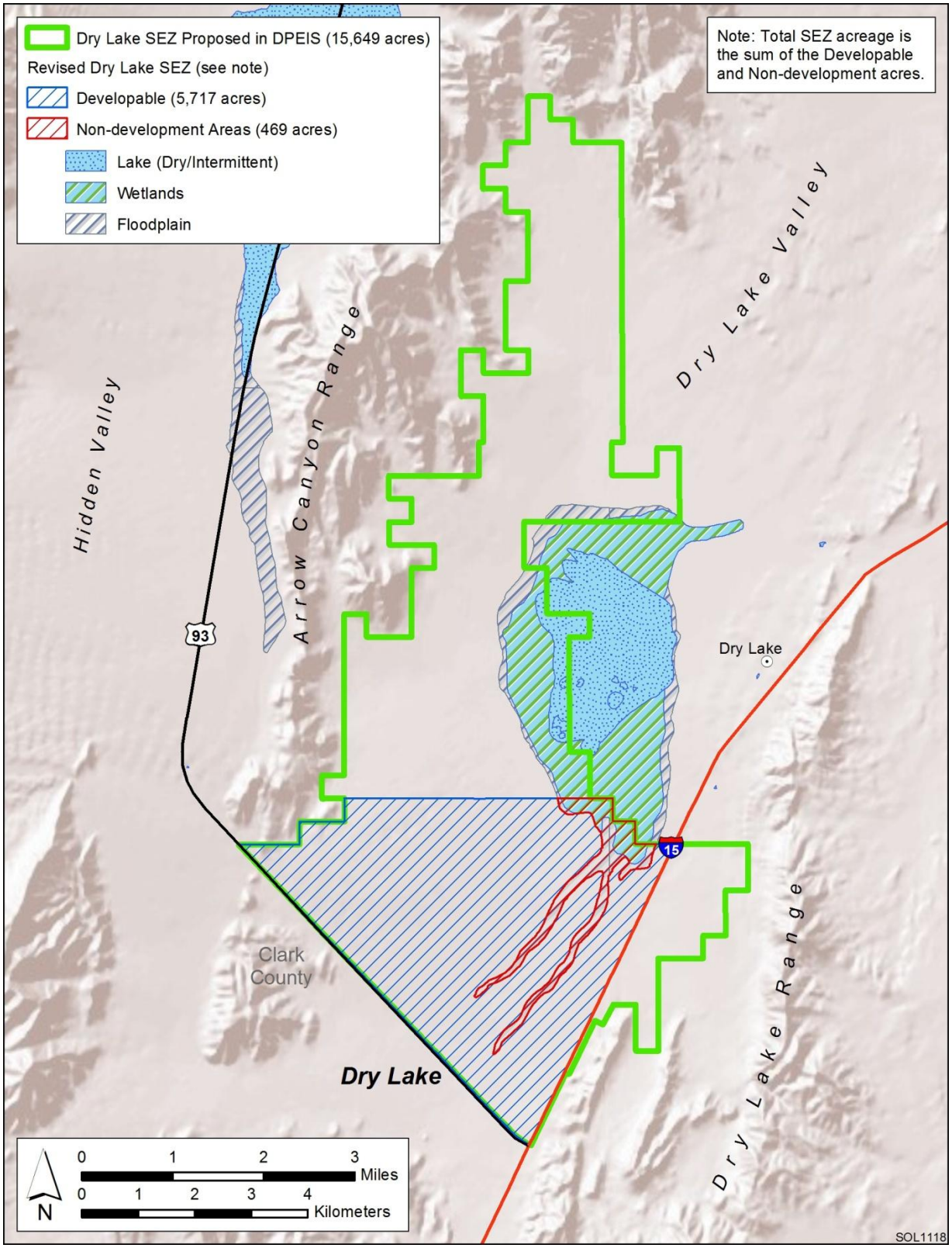

FIGURE 11.3.1.1-2 Developable and Non-development Areas for the Proposed Dry Lake SEZ as Revised

Availability of transmission from SEZs to load centers will be an important consideration for future development in SEZs. For the proposed Dry Lake SEZ, several existing transmission lines, including a 500-kV line, run through the SEZ. It is possible that an existing line could be used to provide access from the SEZ to the transmission grid, but a 500-kV capacity line may not be adequate for 508 to 915 MW of new capacity (a 500-kV line can accommodate approximately the load of one 700-MW facility). Therefore, at full build-out capacity, new transmission and possibly upgrades of existing transmission lines may be required to bring electricity from the proposed Dry Lake SEZ to load centers. An assessment of the most likely load center destinations for power generated at the Dry Lake SEZ and a general assessment of the impacts of constructing and operating new transmission facilities on those load centers is provided in Section 11.3.23. In addition, the generic impacts of transmission and associated infrastructure construction and of line upgrades for various resources are discussed in Chapter 5 of this Final Solar PEIS. Project-specific analyses would also be required to identify the specific impacts of new transmission construction and line upgrades for any projects proposed within the SEZ.

The Dry Lake SEZ partially overlaps three locally designated transmission corridors that are heavily developed with natural gas, petroleum product, and electric transmission lines (including a 500-kV transmission line). For this impact assessment, it is assumed that up to 80% of the proposed SEZ could be developed. This does not take into account the potential limitations to solar development that may result from siting constraints associated with these corridors. The development of solar facilities and existing corridors will be dealt with by the BLM on a case-by-case basis, see Section 11.3.2.2 on impacts on lands and realty for further discussion.

For the proposed Dry Lake SEZ, I-15 and U.S. 93 are adjacent to the SEZ. Existing road access to the proposed Dry Lake SEZ should be adequate to support construction and operation of solar facilities. No additional road construction outside of the SEZ was assumed to be required to support solar development, as summarized in Table 11.3.1.2-1.

11.3.1.3 Programmatic and SEZ-Specific Design Features

The proposed programmatic design features for each resource area to be required under the BLM Solar Energy Program are presented in Section A.2.2 of Appendix A of this Final Solar PEIS. These programmatic design features are intended to avoid, minimize, and/or mitigate adverse impacts of solar energy development and will be required for development on all BLM-administered lands including SEZ and non-SEZ lands.

The discussions below addressing potential impacts of solar energy development on specific resource areas (Sections 11.3.2 through 11.3.22) also provide an assessment of the effectiveness of the programmatic design features in mitigating adverse impacts from solar development within the SEZ. SEZ-specific design features to address impacts specific to the proposed Dry Lake SEZ may be required in addition to the programmatic design features. The proposed SEZ-specific design features for the Dry Lake SEZ have been updated on the

TABLE 11.3.1.2-1 Assumed Development Acreages, Solar MW Output, and Nearest Major Access Road and Transmission Line for the Proposed Dry Lake SEZ as Revised

Total Developable Acreage and Assumed Developed Acreage (80% of Total)	Assumed Maximum SEZ Output for Various Solar Technologies	Distance to Nearest State, U.S., or Interstate Highway	Distance and Capacity of Nearest Existing Transmission Line	Assumed Area of Road ROW	Distance to Nearest Designated Corridor[e]
5,717 acres[a] and 4,574 acres	508 MW[b] 915 MW[c]	I-15 and U.S. 93, 0 mi[d]	0 mi and 500 kV	0 acres	0 mi

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

[b] Maximum power output if the SEZ were fully developed using power tower, dish engine, or PV technologies, assuming 9 acres/MW (0.04 km^2/MW) of land required.

[c] Maximum power output if the SEZ were fully developed using solar trough technologies, assuming 5 acres/MW (0.02 km^2/MW) of land required.

[d] To convert mi to km, multiply by 1.6093.

[e] BLM-designated corridors are developed for federal land use planning purposes only and are not applicable to state-owned or privately owned land.

basis of revisions to the SEZ since the Draft Solar PEIS (such as boundary changes and the identification of non-development areas), and on the basis of comments received on the Draft and Supplement to the Draft. All applicable SEZ-specific design features identified to date (including those from the Draft Solar PEIS that are still applicable) are presented in Sections 11.3.2 through 11.3.22.

11.3.2 Lands and Realty

11.3.2.1 Affected Environment

The total size of the proposed SEZ has been reduced from 15,649 acres (63 km^2) to 6,186 acres (25 km^2), and the remaining area is the southern portion of the original SEZ. The northern boundary of the revised SEZ is about 7.5 mi (12 km) south of the original northern boundary, and the southeastern boundary is now located just west of I-15. Although the area is reduced in size, the general description of the southern portion of the area presented in the Draft Solar PEIS is still accurate. There were three active solar applications within or adjacent to the SEZ as of October 28, 2011, and an additional large application area located about 1 mi (1.6 km) to the east of the SEZ across I-15.

Three designated transmission corridors that are heavily developed with natural gas, petroleum product, and electric transmission lines (including a 500-kV transmission line) pass through the proposed SEZ.

11.3.2.2 Impacts

Solar development of the SEZ would establish a large industrial area that would exclude many existing and potential uses of the land, perhaps in perpetuity. Full development of the revised proposed SEZ is anticipated to disturb up to 4,574 acres (18.5 km^2). The amount of existing electrical transmission and pipelines within the SEZ has been reduced by the boundary changes for the SEZ, but the proposed Dry Lake SEZ still partially overlaps three locally designated corridors. These existing corridors will be the preferred locations for any transmission development that is required to support solar development and future transmission grid improvements related to the build-out of the Dry Lake SEZ. Any use of the corridor lands within the Dry Lake SEZ for solar energy facilities, such as solar panels or heliostats, must be compatible with the future use of the existing corridors. The BLM will assess solar projects in the vicinity of existing corridors on a case-by-case basis. The BLM will review and approve individual project plans of development to ensure compatible development that maintains the use of the corridor.

11.3.2.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on lands and realty are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will provide some mitigation for the identified impacts but will not mitigate all adverse impacts. For example, impacts related to the exclusion of many existing and potential uses of the public land, the visual impact of an industrial-type solar facility within an otherwise rural area, and induced land use changes, if any, on nearby or adjacent state and private lands may not be fully mitigated.

No SEZ-specific design features for lands and realty have been identified through this Final Solar PEIS. Some SEZ-specific design features may be established for parcels within the Dry Lake SEZ through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

11.3.3 Specially Designated Areas and Lands with Wilderness Characteristics

11.3.3.1 Affected Environment

The description in the Draft Solar PEIS is still accurate with some small changes in the distance of specially designated areas from the revised SEZ boundary. The major exception to this is for Arrow Canyon Wilderness, which would now be about 10 mi (16 km) from the SEZ

boundary. In addition, the distance to the Old Spanish National Historic Trail has increased to about 2.1 mi (3.4 km), in comparison to the 1.3 mi (2.1 km) presented in the Draft Solar PEIS.

11.3.3.2 Impacts

Impacts on specially designated areas would be the same as those described in the Draft Solar PEIS with the exception of Arrow Canyon Wilderness. Because of the additional distance between Arrow Canyon Wilderness and the SEZ boundary, it is now anticipated that there would be minimal impact on wilderness characteristics. The distance between the SEZ and the Old Spanish National Historic Trail has also increased somewhat and may result in slightly less impact on the historical setting of the high-potential segment of the Trail. Impacts of solar energy facilities will differ depending on the technologies being installed, with taller facilities having relatively more impact than shorter facilities.

11.3.3.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on specially designated areas are described in Section A.2.2 of Appendix A of this Final Solar PEIS (design features for specially designated areas, cultural resources, and visual resources would address impacts). Implementing the programmatic design features will provide some mitigation for adverse impacts on wilderness characteristics and possibly recreational use of the identified areas. Programmatic design features will be applied to address SEZ-specific resources and conditions, for example:

- For projects in the Dry Lake SEZ which are located within the viewshed of the Old Spanish National Historic Trail, a National Trail inventory will be required to determine the area of possible adverse impact on resources, qualities, values, and associated settings of the trail; to prevent substantial interference; and to determine any areas unsuitable for development. Residual impacts will be avoided, minimized, and/or mitigated to the extent practicable according to program policy standards. Programmatic design features have been included in BLM's Solar Energy Program to address impacts on National Historic Trails (see Section A.2.2.23 of Appendix A).

No SEZ-specific design features for specially designated areas have been identified in this Final Solar PEIS. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

11.3.4 Rangeland Resources

11.3.4.1 Livestock Grazing

11.3.4.1.1 Affected Environment

As presented in the Draft Solar PEIS, there are no active grazing allotments in the proposed Dry Lake SEZ. The revised area of the SEZ does not alter this finding.

11.3.4.1.2 Impacts

Because the SEZ does not contain any active grazing allotments, solar energy development within the SEZ would have no impact on livestock and grazing.

11.3.4.1.3 SEZ-Specific Design Features and Design Feature Effectiveness

Because the SEZ does not contain any active grazing allotments, no SEZ-specific design features to protect livestock grazing have been identified in this Final Solar PEIS.

11.3.4.2 Wild Horses and Burros

11.3.4.2.1 Affected Environment

As presented in Section 11.3.4.2.1 of the Draft Solar PEIS, no wild horse or burro herd management areas occur within the proposed Dry Lake SEZ or in close proximity to it. The reconfiguration of the SEZ does not alter this finding.

11.3.4.2.2 Impacts

As presented in the Draft Solar PEIS, solar energy development within the proposed Dry Lake SEZ would not affect wild horses and burros. Development within the revised area of the Dry Lake SEZ would not alter this conclusion.

11.3.4.2.3 SEZ-Specific Design Features and Design Feature Effectiveness

Because solar energy development within the proposed Dry Lake SEZ would not affect wild horses and burros, no SEZ-specific design features to address wild horses and burros have been identified in this Final Solar PEIS.

11.3.5 Recreation

11.3.5.1 Affected Environment

The discussion of recreation use of the proposed SEZ in the Draft Solar PEIS was focused on the northern portion of the SEZ that has been dropped from further consideration. The proposed boundaries of the revised area contain the more developed portions of the SEZ, and this area offers very little in the way of recreation opportunities. Some roads and trails are designated for vehicle use in the area, but their most important function is thought to be providing access to areas to the north that are now outside of the SEZ boundary. Other than road use, there is little sign of recreation activity in the area.

11.3.5.2 Impacts

The impacts on recreation stated in the Draft Solar PEIS are still generally accurate, although there are fewer roads and trails within the revised SEZ boundary that would be closed. Closing of roads could adversely affect access to undeveloped areas within the SEZ and areas outside the SEZ.

In addition, lands that are outside of the proposed SEZ may be acquired or managed for mitigation of impacts on other resources (e.g., sensitive species). Managing these lands for mitigation could further exclude or restrict recreational use, potentially leading to additional losses in recreational opportunities in the region. The impact of acquisition and management of mitigation lands would be considered as a part of the environmental analysis of specific solar energy projects.

11.3.5.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on recreational resources are described in Section A.2.2 of Appendix A of this Final Solar PEIS (design features for both specially designated areas and visual resources also would address some impacts). Implementing the programmatic design features for visual impacts will help minimize the impacts of individual solar projects. Implementing the programmatic design features for recreation will mitigate the loss of road access to surrounding areas but not mitigate the loss of recreational access to public lands developed for solar energy production or the loss of wildlife-related hunting recreation.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features to address recreation impacts have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

11.3.6 Military and Civilian Aviation

11.3.6.1 Affected Environment

The proposed Dry Lake SEZ as revised is not located under any military airspace, nor is it identified as a DoD Consultation Area in BLM land records. It is located about 13.5 mi (22 km) northeast of Nellis Air Force Base, one of the largest fighter bases in the world. While not located under designated military airspace, the area is close to airspace that is used for military aircraft approaches and departures from Nellis. Data provided in the Draft Solar PEIS remain valid.

11.3.6.2 Impacts

Nellis Air Force Base Command has continued to express concerns over potential impacts on the approach and departure of aircraft from the base from solar energy facilities that might be located in the SEZ. The NTTR has also indicated that facilities taller than 50 ft (15 m) may interfere with testing activities at the NTTR. It is not clear whether the reduction in size of the proposed SEZ will mitigate any of these concerns.

11.3.6.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on military and civilian aviation are described in Section A.2.2 of Appendix A of this Final Solar PEIS. The programmatic design features require early coordination with the DoD to identify and avoid, minimize, and/or mitigate, if possible, potential impacts on the use of military airspace.

No SEZ-specific design features for military and civilian aviation have been identified in this Final Solar PEIS. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

11.3.7 Geologic Setting and Soil Resources

11.3.7.1 Affected Environment

11.3.7.1.1 Geologic Setting

Data provided in the Draft Solar PEIS remain valid, with the following update:

- The terrain of the proposed Dry Lake SEZ is relatively flat (Figure 11.3.7.1-1). The boundaries of the proposed SEZ have been

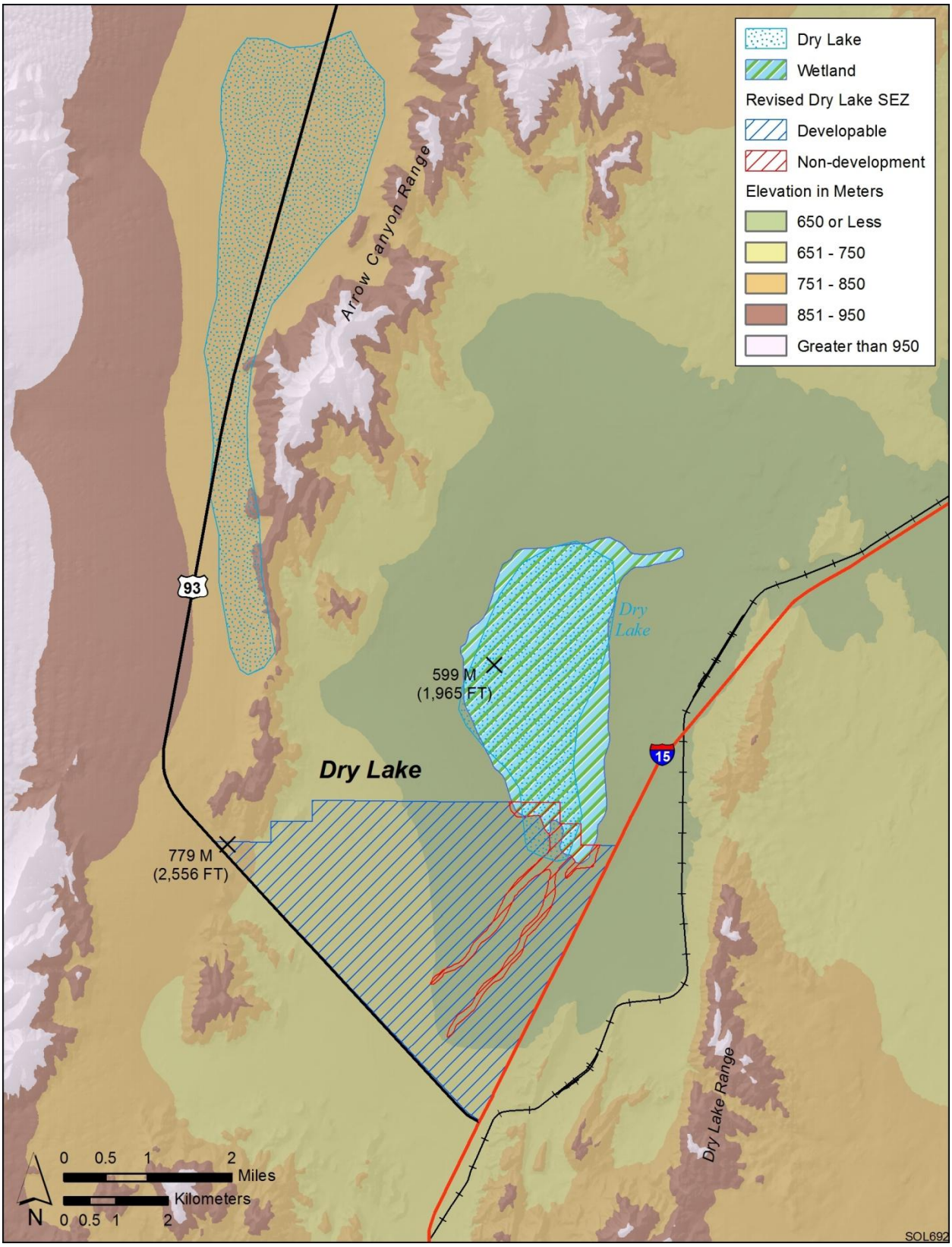

FIGURE 11.3.7.1-1 General Terrain of the Proposed Dry Lake SEZ as Revised

changed to exclude the northern portion of the SEZ. Within the revised area, 469 acres (1.9 km^2) of floodplain and wetland have been designated as non-development areas. On the basis of these changes, the elevations range from about 2,560 ft (780 m) at the northwest corner to about 2,000 ft (610 m) at the northeast corner.

11.3.7.1.2 Soil Resources

Data provided in the Draft Solar PEIS remain valid, with the following updates:

- Soils within the proposed Dry Lake SEZ as revised are predominantly very gravelly and stony loams of the Colorock–Tonopah and Bard–Tonopah associations, which now make up about 95% of the soil coverage at the site (Table 11.3.7.1-1).

- Soil unit coverage at the proposed Dry Lake SEZ as revised is shown in Figure 11.3.7.1-2. The designation of new SEZ boundaries and non-development areas eliminate 4,713 acres (19 km^2) of the Colorock–Tonopah association, 15 acres (0.061 km^2) of the Bard–Tonopah association, 1,546 acres (6.3 km^2) (all) of the Bard very stony loam, 1,189 acres (4.8 km^2) of the Bard gravelly fine sandy loam, 724 acres (2.9 km^2) of the Ireteba loam-overflow, 516 acres (2.1 km^2) (all) of the Ireteba loam, 415 acres (1.7 km^2) (all) of the Grapevine loam, 226 acres (0.91 km^2) of the Rock land–St. Thomas association, 195 acres (0.79 km^2) (all) playas, and 116 acres (0.47 km^2) (all) of the Bard very gravelly fine sandy loam.

11.3.7.2 Impacts

Impacts on soil resources would occur mainly as a result of ground-disturbing activities (e.g., grading, excavating, and drilling), especially during the construction phase of a solar project. Because impacts on soil resources result from ground-disturbing activities in the project area, soil impacts would be roughly proportional to the size of a given solar facility, with larger areas of disturbed soil having a greater potential for impacts than smaller areas (Section 5.7.2). The assessment provided in the Draft Solar PEIS remains valid, with the following updates:

- Impacts related to wind erodibility are reduced because the identification of new SEZ boundaries and non-development areas eliminates 9,429 acres (38 km^2) of moderately erodible soils, including 195 acres (0.79 km^2) of playas, from development.

- Impacts related to water erodibility are reduced because the new SEZ boundaries eliminate 610 acres (2.5 km^2) of moderately erodible soils, including 195 acres (0.79 km^2) of playas, from development.

TABLE 11.3.7.1-1 Summary of Soil Map Units within the Proposed Dry Lake SEZ as Revised

Map Unit Symbol	Map Unit Name	Erosion Potential		Description	Area, in Acres[c] (percentage of SEZ)
		Water[a]	Wind[b]		
CTC	Colorock–Tonopah association, moderately sloping (2 to 8% slopes)	Slight (0.24)	Moderate (WEG 6)[d]	Consists of about 55% Colorock very gravelly clay loam and 40% Tonopah gravelly sandy loam. Nearly level to gently sloping soils on fan remnants. Parent material is calcareous alluvium derived from sedimentary rock. Deep and well to excessively drained, with high surface runoff potential (very slow infiltration rate) and moderate permeability. Available water capacity is low. Moderate rutting hazard. Colorock soils have well-developed pavements. Used mainly as rangeland, forestland, or wildlife habitat; unsuitable for cultivation.	4,064 (65.7)[e]
BRB	Bard–Tonopah association, gently sloping	Slight (0.28)	Moderate (WEG 5)	Consists of about 60% Bard gravelly fine sandy loam and 30% Tonopah gravelly sandy loam. Gently sloping soils on fan remnants. Parent material is alluvium derived from limestone and dolomite. Shallow and deep, well to excessively drained, with high surface runoff potential (very slow infiltration rate) and moderate permeability. Available water capacity is very low. Moderate rutting hazard. Used mainly as rangeland, forestland, or wildlife habitat; unsuitable for cultivation.	1,799 (21.9)[f]
BHC	Bard gravelly fine sandy loam (2 to 8% slopes)	Slight (0.20)	Moderate (WEG 4)	Nearly level to gently sloping soils on fan remnants. Parent material consists of alluvium derived from limestone and dolomite. Moderately deep and well drained, with high surface runoff potential (very slow infiltration rate) and high permeability. Available water capacity is very low. Moderate rutting hazard. Used mainly as rangeland, forestland, or wildlife habitat; unsuitable for cultivation.	160 (2.6)
It	Ireteba loam, overflow	Slight (0.28)	Moderate (WEG 4)	Nearly level soils formed on floodplains. Parent material consists of alluvium derived from mixed sources. Moderately deep and well drained, with moderate surface runoff potential and moderate permeability Low resistance to compaction. Available water capacity is high. Severe rutting hazard. Used mainly as rangeland, forestland, or wildlife habitat; unsuitable for cultivation.	130 (2.1)[g]

TABLE 11.3.7.1-1 (Cont.)

Map Unit Symbol	Map Unit Name	Erosion Potential		Description	Area, in Acres[c] (percentage of SEZ)
		Water[a]	Wind[b]		
RTF	Rock land–St. Thomas association, very steep	Not rated	Not rated	Consists of about 60% rockland and 30% St. Thomas. Steeply sloping soils on mountain slopes. Parent material is colluvium derived from limestone and dolomite over residuum weathered from limestone and dolomite. Shrink-swell potential is low. Available water capacity is very low. Used mainly as rangeland, forestland, or wildlife habitat; unsuitable for cultivation.	34 (<1)

[a] Water erosion potential rates based on soil erosion factor K, which indicates the susceptibility of soil to sheet and rill erosion by water. Values range from 0.02 to 0.69 and are provided in parentheses under the general rating; a higher value indicates a higher susceptibility to erosion. Estimates based on the percentage of silt, sand, and organic matter and on soil structure and saturated hydraulic conductivity. A rating of "slight" indicates that erosion is unlikely under ordinary climatic conditions.

[b] Wind erosion potential here is based on the wind erodibility group (WEG) designation: groups 1 and 2, high; groups 3 through 6, moderate; and groups 7 and 8, low (see footnote d for further explanation).

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

[d] WEGs are based on soil texture, content of organic matter, effervescence of carbonates, content of rock fragments, and mineralogy, and also take into account soil moisture, surface cover, soil surface roughness, wind velocity and direction, and the length of unsheltered distance (USDA 2004). Groups range in value from 1 (most susceptible to wind erosion) to 8 (least susceptible to wind erosion). The NRCS provides a wind erodibility index, expressed as an erosion rate in tons per acre per year, for each of the wind erodibility groups: WEG 1, 220 tons (200 metric tons) per acre (4,000 m^2) per year (average); WEG 2, 134 tons (122 metric tons) per acre (4,000 m^2) per year; WEGs 3 and 4 (and 4L), 86 tons (78 metric tons) per acre (4,000 m^2) per year; WEG 5, 56 tons (51 metric tons) per acre (4,000 m^2) per year; WEG 6, 48 tons (44 metric tons) per acre (4,000 m^2) per year; WEG 7, 38 tons (34 metric tons) per acre (4,000 m^2) per year; and WEG 8, 0 tons (0 metric tons) per acre (4,000 m^2) per year.

[e] A total of 47 acres (0.19 km^2) within the Colorock–Tonopah association is currently categorized as a non-development area (denoted by red areas in Figure 11.3.7.1-2).

[f] A total of 298 acres (1.2 km^2) within the Bard–Tonopah association is currently categorized as a non-development area (denoted by red areas in Figure 11.3.7.1-2).

[g] A total of 124 acres (0.50 km^2) within the Ireteba loam, overflow is currently categorized as a non-development area (denoted by red areas in Figure 11.3.7.1-2).

Source: NRCS (2010).

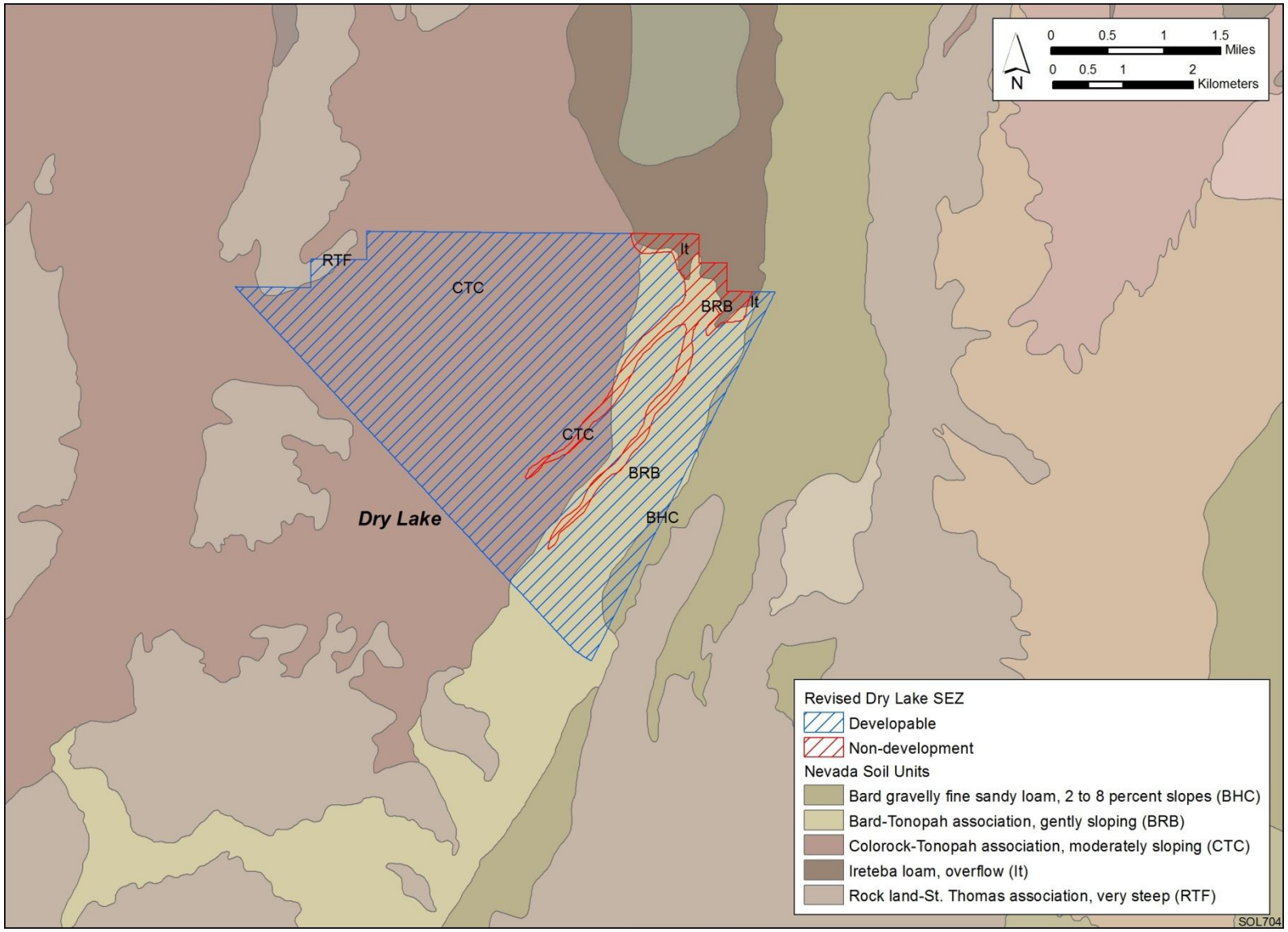

FIGURE 11.3.7.1-2 Soil Map for the Proposed Dry Lake SEZ as Revised (NRCS 2008)

11.3.7.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on soils are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will reduce the potential for soil impacts during all project phases.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for soil resources have been identified at the proposed Dry Lake SEZ. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

11.3.8 Minerals (Fluids, Solids, and Geothermal Resources)

A mineral potential assessment for the proposed Dry Lake SEZ has been prepared and reviewed by BLM mineral specialists knowledgeable about the region where the SEZ is located (BLM 2012a). The BLM is proposing to withdraw the SEZ from settlement, sale, location, or entry under the general land laws, including the mining laws, for a period of 20 years (see Section 2.2.2.2.4 of this Final Solar PEIS). The potential impacts of this withdrawal are discussed in Section 13.3.24.

11.3.8.1 Affected Environment

The active mining claims on two sections of the SEZ discussed in the Draft Solar PEIS are located within the revised SEZ. The mineral processing plant is also still within the SEZ. Data provided in the Draft Solar PEIS remain valid.

11.3.8.2 Impacts

The existing mining claims in the proposed SEZ are prior existing rights and, if they are valid, would likely preclude solar development within the claimed areas. This portion of the SEZ is also encumbered with numerous ROWs, so it is not likely to be utilized for solar development.

11.3.8.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on mineral resources are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will provide adequate protection of mineral resources.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for minerals have been identified in this Final Solar

PEIS. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

11.3.9 Water Resources

11.3.9.1 Affected Environment

The overall size of the Dry Lake SEZ has been reduced by 60% from the area described in the Draft Solar PEIS, resulting in a total area of 6,186 acres (25 km^2). The description of the affected environment given in the Draft Solar PEIS relevant to water resources at the proposed Dry Lake SEZ remains valid and is summarized in the following paragraphs.

The Dry Lake SEZ is within the Lower Colorado–Lake Mead subbasin of the Lower Colorado River Basin hydrologic region. The SEZ is located in Garnet Valley (also called Dry Lake Valley), surrounded by the Arrow Canyon Range to the west and the Dry Lake Range to the southeast. The average precipitation is about 5 in./yr (13 cm/yr), and the estimated pan evaporation rate is approximately 99 in./yr (251 cm/yr). There are no perennial surface water features in the SEZ. Dry Lake is adjacent to the northeastern boundary of the SEZ with 469 acres (1.9 km^2) of the dry lake and associated intermittent/ephemeral channels within the SEZ being identified as non-development areas. The revised SEZ boundaries lie outside the 100-year and 500-year floodplain areas associated with Dry Lake. The proposed Dry Lake SEZ is part of the Garnet Valley groundwater basin, a basin-fill aquifer covering approximately 342,400 acres (1,386 km^2). The basin-fill aquifer consists of unconfined alluvium and lacustrine deposits of sand, silt, and clay, with an average thickness of around 600 ft (183 m). Regional-scale carbonate rock aquifers underlay the basin-fill aquifers in Garnet Valley. These carbonate rock aquifers are a part of the White River Groundwater Flow System (a subunit of the Colorado River groundwater system), a regional-scale groundwater system that generally flows southward and terminates at Muddy River Springs, Rogers and Blue Point Springs, and the Virgin River. Estimates of groundwater recharge are approximately 800 ac-ft/yr (990,000 m^3/yr), groundwater elevations are approximately between 230 and 760 ft (70 and 230 m), and groundwater flows from the west to the east in the vicinity of the SEZ. Groundwater quality varies in Garnet Valley, but concentrations of TDS, sulfate, iron, fluoride, manganese, and radon-222 have all been recorded at higher than the MCLs in the area surrounding the SEZ.

All waters in Nevada are public property and the NDWR is the agency responsible for managing both surface and groundwater resources. The Garnett Valley groundwater basin is a designated groundwater basin, and preferred uses of groundwater include municipal, quasi-municipal, industrial, commercial, mining, stockwater, and wildlife purposes, set up to specifically exclude irrigation. The perennial yield for Garnett Valley is set at 400 ac-ft/yr (490,000 m^3/yr), and the basin is currently overappropriated, with approximately 3,400 ac-ft/yr (4.2 million m^3/yr) committed for beneficial uses. An additional 44,500 ac-ft/yr (55 million m^3/yr) of water right applications are held in abeyance, and no new water right applications are being accepted according to State Engineer's Order 1169 (NDWR 2002), which calls for further studies on potential impacts from groundwater pumping in Garnett Valley, and several other

adjacent valleys, on regional-scale groundwater conditions in the carbonate rock aquifers. Solar developers would most likely have to purchase and transfer existing water rights in Garnett Valley, which may be difficult given the overallocated state of the basin and the number of competing water rights being held in abeyance.

In addition to the water resources information provided in the Draft Solar PEIS, this section provides a planning-level inventory of available climate, surface water, and groundwater monitoring stations within the immediate vicinity of the Dry Lake SEZ and surrounding basin. Additional data regarding climate, surface water, and groundwater conditions are presented in Tables 11.3.9.1-1 through 11.3.9.1-7 and in Figures 11.3.9.1-1 and 11.3.9.1-2. Fieldwork and hydrologic analyses to determine jurisdictional water bodies would need to be coordinated with appropriate federal, state, and local agencies. Areas within the Dry Lake SEZ that are determined to be jurisdictional will be subject to the permitting process described in the CWA.

11.3.9.2 Impacts

11.3.9.2.1 Land Disturbance Impacts on Water Resources

The discussion of land disturbance effects on water resources in the Draft Solar PEIS remains valid. As stated in the Draft Solar PEIS, land disturbance impacts in the vicinity of the proposed Dry Lake SEZ could potentially affect drainage patterns, along with groundwater recharge and discharge properties. The alteration of natural drainage pathways during construction can lead to impacts related to flooding, loss of water delivery to downstream regions, and alterations to riparian vegetation and habitats. The alteration of the SEZ boundaries to exclude the 100-year floodplain area that included Dry Lake and two intermittent/ephemeral streams reduces the potential for adverse impacts associated with land disturbance activities.

TABLE 11.3.9.1-1 Watershed and Water Management Basin Information Relevant to the Proposed Dry Lake SEZ as Revised

Basin	Name	Area (acres)[b]
Subregion (HUC4)[a]	Lower Colorado–Lake Mead (1501)	19,383,151
Cataloging unit (HUC8)	Muddy (15010012)	1,159,401
Groundwater basin	Garnet Valley	101,639
SEZ	Dry Lake SEZ	6,186

[a] HUC = Hydrologic Unit Code; a USGS system for characterizing nested watersheds that includes large-scale subregions (HUC4) and small-scale cataloging units (HUC8).

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

TABLE 11.3.9.1-2 Climate Station Information Relevant to the Proposed Dry Lake SEZ as Revised

Climate Station (COOP ID[a])	Elevation[b] (ft)[c]	Distance to SEZ (mi)[d]	Period of Record	Mean Annual Precipitation (in.)[e]	Mean Annual Snowfall (in.)
Desert Game Range, Nevada (262243)	2,920	26	1940–2011	4.50	0.70
Las Vegas NWFO, Nevada (264439)	1,898	17	1996–2011	4.94	0.40
Overton, Nevada (265846)	1,250	26	1939–2011	4.71	0.20
Sunrise Manor Las Vegas, Nevada (267925)	1,821	18	1961–1989	4.28	0.60
Valley of Fire State Park, Nevada (268588)	2,000	21	1972–2011	6.54	0.30

[a] National Weather Service's Cooperative Station Network station identification code.

[b] Surface elevations for the proposed Dry Lake SEZ range from 1,970 to 2,560 ft.

[c] To convert ft to m, multiply by 0.3048.

[d] To convert mi to km, multiply by 1.6093.

[e] To convert in. to cm, multiply by 2.540.

Source: NOAA (2012).

TABLE 11.3.9.1-3 Total Lengths of Selected Streams at the Subregion, Cataloging Unit, and SEZ Scale Relevant to the Proposed Dry Lake SEZ as Revised

Water Feature	Subregion, HUC4 (ft)[a]	Cataloging Unit, HUC8 (ft)	SEZ (ft)
Unclassified streams	77,194	9,320	0
Perennial streams	6,478,881	155,849	0
Intermittent/ephemeral streams	440,786,248	24,271,247	108,169
Canals	1,380,645	125,983	0

[a] To convert ft to m, multiply by 0.3048.

Source: USGS (2012a).

TABLE 11.3.9.1-4 Stream Discharge Information Relevant to the Proposed Dry Lake SEZ as Revised

Parameter	Station (USGS ID)	
	Dry Lake Tributary near Nellis Air Force Base, Nevada (09417100)	Muddy River at Lewis Avenue at Overton, Nevada (09419507)
Period of record	1964–1975	1998–2010
No. of observations	12	10
Discharge, median (ft^3/s)[a]	0	94
Discharge, range (ft^3/s)	0–180	30–1,300
Discharge, most recent observation (ft^3/s)	4	83
Distance to SEZ (mi)[b]	4	27

[a] To convert ft^3 to m^3, multiply by 0.0283.

[b] To convert mi to km, multiply by 1.6093.

Source: USGS (2012b).

Land clearing, land leveling, and vegetation removal during the development of the SEZ have the potential to disrupt intermittent/ephemeral stream channels. Several programmatic design features described in Section A.2.2 of Appendix A of this Final Solar PEIS would avoid, minimize, and/or mitigate impacts associated with the disruption of intermittent/ephemeral water features. Additional analyses of intermittent/ephemeral streams are presented in this update, including an evaluation of functional aspects of stream channels with respect to groundwater recharge, flood conveyance, sediment transport, geomorphology, and ecological habitats. Only a summary of the results from these surface water analyses is presented in this section; more information on methods and results is presented in Appendix O.

TABLE 11.3.9.1-5 Surface Water Quality Data Relevant to the Proposed Dry Lake SEZ as Revised

Parameter	Station (USGS ID)[a] 362718114503801	09419507
Period of record	1985	2001–2009
No. of records	1	31
Temperature (°C)[b]	29	20.7 (10.7–25.9)
Total dissolved solids (mg/L)	951	1,120 (902–1,360)
Dissolved oxygen (mg/L)	2	8.3 (7–10.6)
pH	7.3	8.15 (8–8.2)
Total nitrogen (mg/L)	<0.100	0.32 (0.27–0.97)
Phosphorus (mg/L as P)	<0.01	NA
Organic carbon (mg/L)	NA[c]	3 (2.7–4.2)
Calcium (mg/L)	110	109 (79.2–173)
Magnesium (mg/L)	48	53.3 (44.1–69.8)
Sodium (mg/L)	120	174 (141–219)
Chloride (mg/L)	170	116 (100–139)
Sulfate (mg/L)	360	432 (359–577)
Arsenic (µg/L)	NA	30.2 (27.7–46.7)

[a] Median values are listed; the range in values is shown in parentheses.

[b] To convert °C to °F, multiply by 1.8, then add 32.

[c] NA = no data collected for this parameter.

Source: USGS (2012b).

The study region considered for the intermittent/ephemeral stream evaluation relevant to the Dry Lake SEZ is a subset of the watersheds (HUC8) for which information regarding stream channels is presented in Tables 11.3.9.1-3 and 11.3.9.1-4 of this Final Solar PEIS. The results of the intermittent/ephemeral stream evaluation are shown in Figure 11.3.9.2-1, which depicts a subset of flow lines from the National Hydrography Dataset (USGS 2012a) labeled as having a low, moderate, or high sensitivity to land disturbance (Figure 11.3.9.2-1). The analysis indicated that 36% of total length of the intermittent/ephemeral stream channel reaches in the evaluation had low sensitivity, 63% had moderate sensitivity, and 1% had high sensitivity to land disturbance. Several intermittent/ephemeral channels within the SEZ were classified as having moderate sensitivity to land disturbance.

11.3.9.2.2 Water Use Requirements for Solar Energy Technologies

Changes in the Dry Lake SEZ boundaries resulted in significant changes to the estimated water use requirements during construction and operations. This section presents changes in water use estimates for the reduced SEZ area and additional analyses pertaining to groundwater. The additional analyses of groundwater include a basin-scale groundwater budget and a

TABLE 11.3.9.1-6 Water Quality Data from Groundwater Samples Relevant to the Proposed Dry Lake SEZ as Revised

Parameter	Station (USGS ID)[a]		
	362329114541401	363308114553001	362507114572701
Period of record	1986	1986	2003
No. of records	1	1	1
Temperature (°C)[b]	24	25	27.2
Total dissolved solids (mg/L)	NA[c]	NA	984
Dissolved oxygen (mg/L)	4.8	3.8	1.9
pH	7.4	7.8	7.2
Nitrate + nitrite (mg/L as N)	0.42	1.9	0.1
Phosphate (mg/L)	< 0.01	0.04	NA
Organic carbon (mg/L)	NA	NA	< 0.3
Calcium (mg/L)	120	33	111
Magnesium (mg/L)	47	30	50.1
Sodium (mg/L)	140	86	106
Chloride (mg/L)	180	64	154
Sulfate (mg/L)	370	90	329
Arsenic (µg/L)	NA	NA	3.1
Radon-222 (pCi/L)	NA	NA	26

[a] Median values are listed.

[b] To convert °C to °F, multiply by 1.8, then add 32.

[c] NA = no data collected for this parameter.

Source: USGS (2012b).

simplified, one-dimensional groundwater model of potential groundwater drawdown. Only a summary of the results from these groundwater analyses is presented in this section; more information on methods and results is presented in Appendix O.

Table 11.3.9.2-1 presents the revised estimates of water requirements for both construction and operation of solar facilities at the proposed Dry Lake SEZ assuming full build-out of the SEZ and accounting for its decreased size. A basin-scale groundwater budget was assembled using available data on groundwater inputs, outputs, and storage, with results presented in Table 11.3.9.2-2.

The estimated total water use requirements during the peak construction year are as high as 1,740 ac-ft/yr (2.1 million m^3/yr), which is more than two times the estimated annual inputs to the basin and is on par with the current groundwater withdrawals in the Garnet Valley Basin. Given the short duration of construction activities, the water use estimate for construction is not a primary concern to water resources in the basin. The long duration of groundwater pumping during operations (20 years) poses a greater threat to groundwater resources. This analysis considered low, medium, and high groundwater pumping scenarios that represent full build-out

TABLE 11.3.9.1-7 Groundwater Surface Elevations Relevant to the Proposed Dry Lake SEZ as Revised

Parameter	Station (USGS ID)			
	362318114545801	362329114541401	362417114525601	362531114524201
Period of record	1963–1990	1971	1985	1956
No. of observations	3	1	1	1
Surface elevation (ft)[a]	2,211	2,170	2,200	2,045
Well depth (ft)	300	500	NA[d]	793
Depth to water, median (ft)	233	338	392	226
Depth to water, range (ft)	230–250	–[c]	–	–
Depth to water, most recent observation (ft)	250	338	391.94	226.4
Distance to SEZ (mi)[b]	2	2	1	1

[a] To convert ft to m, multiply by 0.3048.

[b] To convert mi to km, multiply by 1.6093.

[c] A dash indicates only one data point at this site.

[d] NA = data not available.

Source: USGS (2012b).

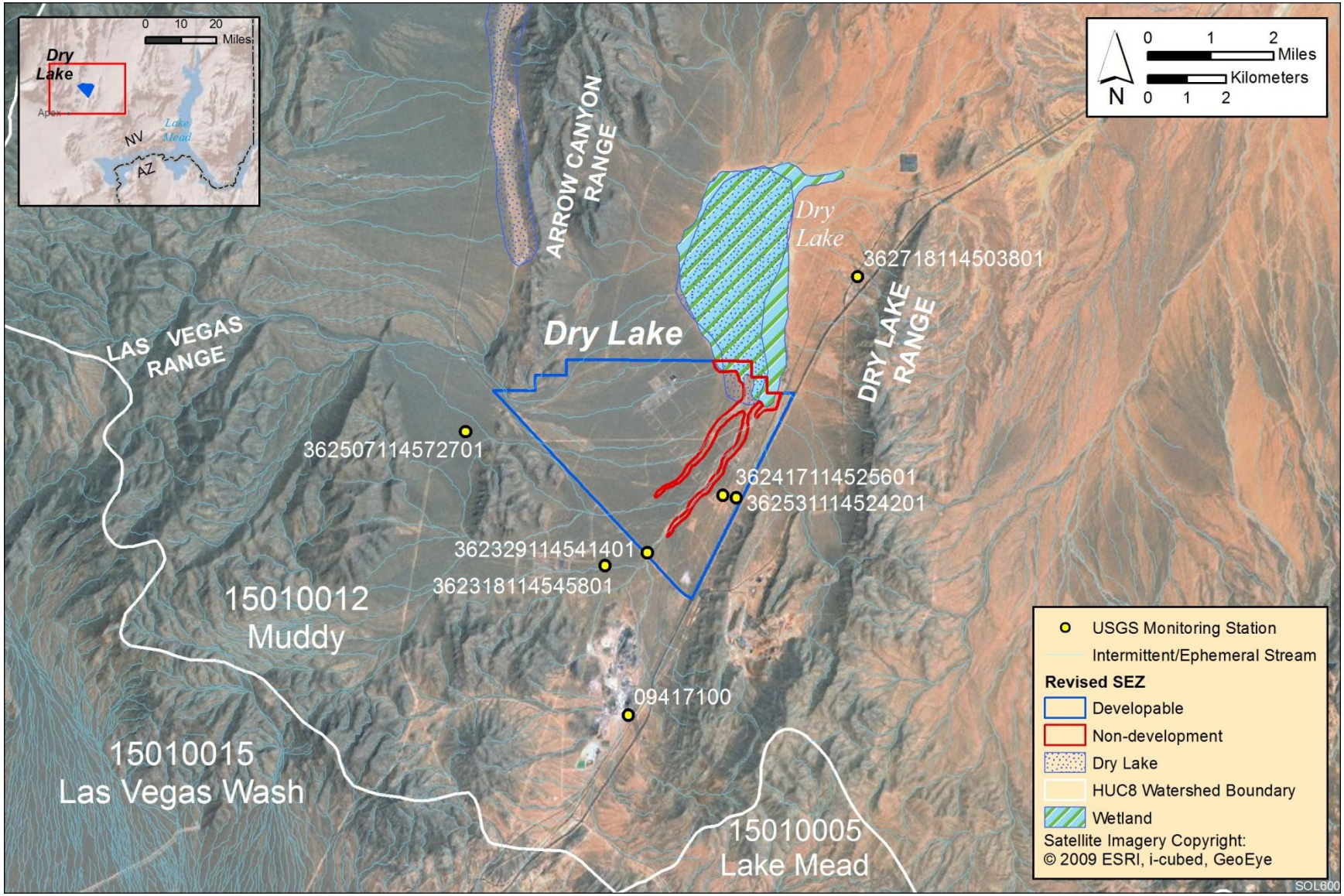

FIGURE 11.3.9.1-1 Water Features near the Proposed Dry Lake SEZ as Revised

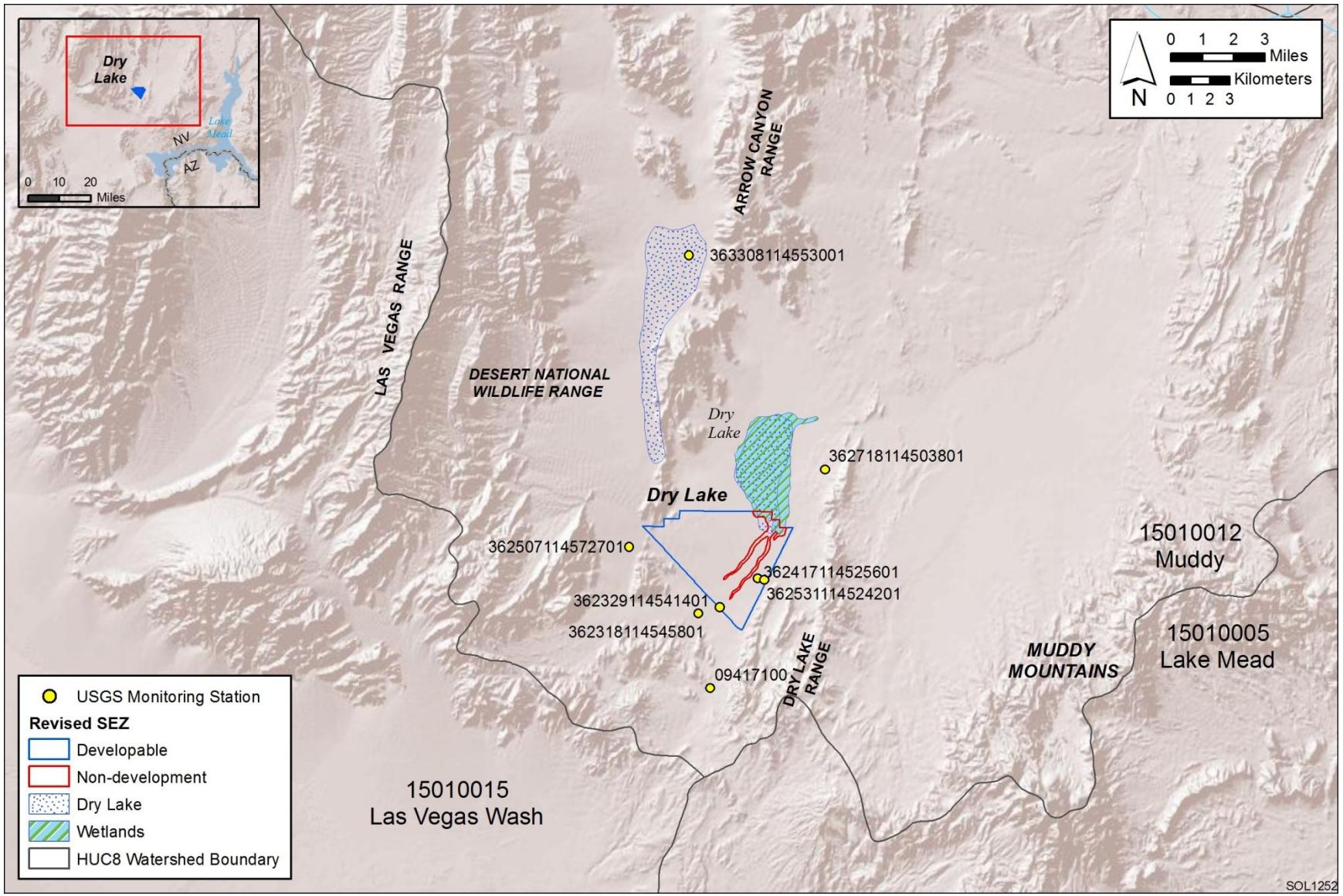

FIGURE 11.3.9.1-2 Water Features within the Muddy River Watershed, Which Includes the Proposed Dry Lake SEZ as Revised

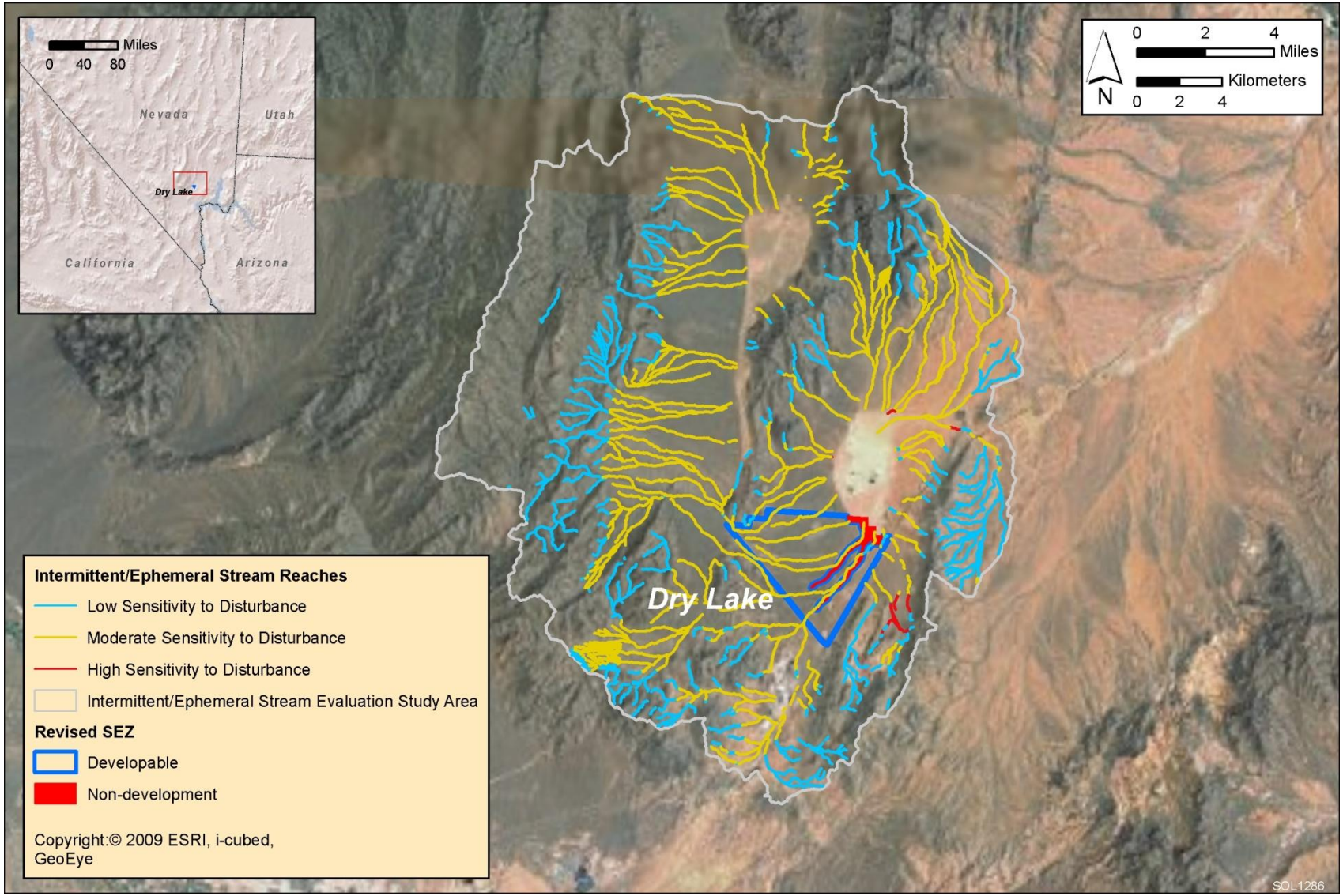

FIGURE 11.3.9.2-1 Intermittent/Ephemeral Stream Channel Sensitivity to Surface Disturbances in the Vicinity of the Proposed Dry Lake SEZ as Revised

TABLE 11.3.9.2-1 Estimated Water Requirements for the Proposed Dry Lake SEZ as Revised[a]

Activity	Parabolic Trough	Power Tower	Dish Engine	PV
Construction—Peak Year				
Water use requirements				
Fugitive dust control (ac-ft)[b]	1,130	1,695	1,695	1,695
Potable supply for workforce (ac-ft)	74	45	19	9
Total water use requirements (ac-ft)	1,204	1,740	1,714	1,704
Wastewater generated				
Sanitary wastewater (ac-ft)	74	45	19	9
Operations				
Water use requirements				
Mirror/panel washing (ac-ft/yr)	457	254	254	25
Potable supply for workforce (ac-ft/yr)	13	6	6	<1
Dry cooling (ac-ft/yr)	183–915	102–508	NA	NA
Wet cooling (ac-ft/yr)	4,116–13,263	2,287–7,369	NA	NA
Total water use requirements				
Non-cooled technologies (ac-ft/yr)	NA[c]	NA	260	25
Dry-cooled technologies (ac-ft/yr)	653–1,385	362–768	NA	NA
Wet-cooled technologies (ac-ft/yr)	4,586–13,733	2,547–7,629	NA	NA
Wastewater generated				
Blowdown (ac-ft/yr)	260	144	NA	NA
Sanitary wastewater (ac-ft/yr)	13	6	6	<1

[a] See Section M.9.2 of Appendix M of the Draft Solar PEIS for methods used in estimating water use requirements.

[b] To convert ac-ft to m^3, multiply by 1,234.

[c] NA = not applicable.

of the SEZ assuming PV, dry-cooled parabolic trough, and wet-cooled parabolic trough, respectively (a 30% operational time was considered for all the solar facility types on the basis of operations estimates for recently proposed utility-scale solar energy facilities).

The low, medium, and high pumping scenarios result in groundwater withdrawals that range from 26 to 4,586 ac-ft/yr (0.032 to 5.7 million m^3/yr), or 520 to 91,720 ac-ft (0.64 to 113 million m^3) over the 20-year operational period. From a groundwater budgeting perspective, the high pumping scenario would represent 5.7 times the estimated total annual groundwater inputs to the basin and more than 9% of the estimated groundwater storage in the Garnet Valley Basin over the 20-year operational period. In addition, the average annual groundwater outputs from the basin can be more than 2 times the groundwater inputs to the basin. The low and medium pumping scenarios have annual withdrawals that represent 3% and 82%, respectively,

TABLE 11.3.9.2-2 Groundwater Budget for the Garnet Valley Groundwater Basin, Which Includes the Proposed Dry Lake SEZ as Revised

Process	Amount
Inputs	
Recharge (ac-ft/yr)[a,b]	400
Underflow from Hidden Valley (ac-ft/yr)	400
Outputs	
Underflow to California Wash basin (ac-ft/yr)	800
Total withdrawals (ac-ft/yr)	800–1,600[c]
Storage	
Aquifer storage (ac-ft)	1,000,000[d]
Perennial yield (ac-ft/yr)	400[e]

[a] Groundwater recharge includes mountain front, intermittent/ephemeral channel seepage, and direct infiltration recharge processes.

[b] To convert ac-ft to m^3, multiply by 1,234.

[c] Water use varies by year and is primarily for mining and industrial use (NDWR 2010a,b).

[d] Burbey (1997).

[e] Defined by NDWR.

Source: Rush (1968).

of the estimate of groundwater inputs to the basin (Table 11.3.9.2-2). Increases in groundwater extraction from the basin could impair other users and affect ecological habitats.

Groundwater budgeting allows for quantification of complex groundwater processes at the basin scale, but it ignores the temporal and spatial components of how groundwater withdrawals affect groundwater surface elevations, groundwater flow rates, and connectivity to surface water features such as streams, wetlands, playas, and riparian vegetation. A one-dimensional groundwater modeling analysis was performed to present a simplified depiction of the spatial and temporal effects of groundwater withdrawals by examining groundwater drawdown in a radial direction around the center of the SEZ for the low, medium, and high pumping scenarios. A detailed discussion of the groundwater modeling analysis is presented in Appendix O. It should be noted, however, that the aquifer parameters used for the one dimensional groundwater model (Table 11.3.9.2-3) represent available literature data, and that the model aggregates these value ranges into a simplistic representation of the aquifer.

Currently, the depth to groundwater ranges between 226 and 392 ft (69 and 119 m) in the vicinity of the SEZ (Table 11.3.9.1-7). The modeling results suggest that groundwater

TABLE 11.3.9.2-3 Aquifer Characteristics and Assumptions Used in the One-Dimensional Groundwater Model for the Proposed Dry Lake SEZ as Revised

Parameter	Value
Aquifer type/conditions	Basin fill/unconfined
Aquifer thickness (ft)	1,640[b]
Hydraulic conductivity (ft/day)	1[c]
Transmissivity (ft^2/day)	1,640
Specific yield	0.1[c]
Analysis period (yr)	20
High pumping scenario (ac-ft/yr)[a]	4,586
Medium pumping scenario (ac-ft/yr)	653
Low pumping scenario (ac-ft/yr)	26

[a] To convert ac-ft to m^3, multiply by 1,234.

[b] Source: Freeze and Cherry (1979).

[c] Source: Rush (1968).

withdrawals for solar energy development would result in groundwater drawdown in the vicinity of the SEZ (approximately a 2-mi [3.2-km] radius) that ranges from 17 to more than 75 ft (5.1 to 23 m) for the high pumping scenario, 2.4 to 12 ft (0.7 to 4 m) for the medium pumping scenario, and less than 1 ft (0.3 m) for the low pumping scenario (Figure 11.3.9.2-2). The modeled groundwater drawdown for the high pumping scenario suggests a potential for 10 ft (3 m) of drawdown at a distance of 2 mi (3.2 km) from the center of the SEZ, which could impair groundwater-surface water connectivity via infiltration processes during channel inundation, along with alterations to the wetlands in Dry Lake and the riparian vegetation along the unnamed intermittent/ephemeral streams along the eastern edge of the SEZ that are within the 100-year floodplain.

11.3.9.2.3 Off-Site Impacts: Roads and Transmission Lines

As stated in the Draft Solar PEIS, impacts associated with the construction of roads and transmission lines primarily deal with water use demands for construction, water quality concerns relating to potential chemical spills, and land disturbance effects on the natural hydrology. Water needed for transmission line construction activities (e.g., for soil compaction, dust suppression, and potable supply for workers) could be trucked to the construction area from an off-site source. If this occurred, water use impacts at the SEZ would be negligible. The Draft Solar PEIS assessment of impacts on water resources from road and transmission line construction remains valid.

FIGURE 11.3.9.2-2 Estimated One-Dimensional Groundwater Drawdown Resulting from High, Medium, and Low Groundwater Pumping Scenarios over the 20-Year Operational Period at the Proposed Dry Lake SEZ as Revised

11.3.9.2.4 Summary of Impacts on Water Resources

The additional information and analyses of water resources presented in this update agree with the information provided in the Draft Solar PEIS, which indicates that the proposed Dry Lake SEZ is located in a desert valley with predominately intermittent/ephemeral surface water features and groundwater in a basin-fill aquifer overlaying a regional-scale carbonate rock aquifer system. Historical groundwater use in the region has led to groundwater declines of approximately 20 ft (6 m) from the 1950s to the 1980s. The NDWR set the perennial yield for the Garnet Valley to 400 ac-ft/yr (490,000 m^3/yr), and the basin is currently overappropriated with approximately 3,400 ac-ft/yr (4.2 million m^3/yr) committed for beneficial uses. An additional 44,500 ac-ft/yr (55 million m^3/yr) of water right applications are held in abeyance, and no new water right applications are being accepted. These baseline conditions suggest that water resources are scarce in the vicinity of the Dry Lake SEZ, and that the primary potential for impacts resulting from solar energy development comes from surface disturbances and groundwater use.

The change in boundaries of the proposed Dry Lake SEZ and the designation of non-development areas within the 100-year floodplain resulted in a decrease in total water demand by approximately 60% for all technologies (Table 11.3.9.2-1). The areas excluded from the SEZ contain the Dry Lake and the associated wetlands adjacent to the northeast corner of the SEZ as revised, and the area of the 100-year floodplain associated with the unnamed washes along the eastern edge of the SEZ. These changes in the SEZ boundaries have reduced potential impacts associated with groundwater withdrawals and surface disturbance on surface water features.

Disturbance to intermittent/ephemeral stream channels within the Dry Lake SEZ could pose an impact on the critical functions of groundwater recharge, sediment transport, flood

conveyance, and ecological habitat in the vicinity of the SEZ. The intermittent/ephemeral stream evaluation suggests that several intermittent/ephemeral channels within the SEZ have a moderate sensitivity to disturbance. Surface disturbances within the Dry Lake SEZ could also lead to impacts within upstream and downstream reaches of unnamed intermittent/ephemeral streams that flow through the SEZ. Several programmatic design features described in Section A.2.2 of Appendix A of this Final Solar PEIS describe measures to protect and mitigate for impacts on intermittent/ephemeral water features.

The proposed water use for full-build out scenarios at the Dry Lake SEZ indicate that the low pumping scenario is preferable, given that the medium and high pumping scenarios have the potential to greatly affect both the annual and long-term groundwater budget, and that the high pumping scenario may impair potential groundwater-surface water connectivity in Dry Lake and the unnamed intermittent/ephemeral streams along the eastern edge of the SEZ. The availability of groundwater in the Garnet Valley basin for solar development will largely depend on water rights availability and decisions made by the NDWR.

Predicting impacts associated with groundwater withdrawals in desert regions is often difficult given the heterogeneity of aquifer characteristics, the long time period between the onset of pumping and its effects, and limited data. One of the primary mitigation measures to protect water resources is the implementation of long-term monitoring and adaptive management (see Section A.2.4 of Appendix A). For groundwater, this requires the combination of monitoring and modeling to fully identify the temporal and spatial extent of potential impacts. The BLM is currently working on the development of a more detailed numerical groundwater model for the Dry Lake SEZ, which would more accurately predict potential impacts on surface water features and groundwater drawdown. When the detailed model is completed, it will be made available through the project Web site (http://solareis.anl.gov) for use by applicants, the BLM, and other stakeholders.

11.3.9.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on surface water and groundwater are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will provide some protection of and reduce impacts on water resources.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, the following SEZ-specific design feature has been identified:

- Groundwater analyses suggest that full build-out of dry-cooled and wet-cooled technologies is not feasible; for mixed-technology development scenarios, any proposed dry- or wet-cooled projects should utilize water conservation practices.

The need for additional SEZ-specific design features will be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

11.3.10 Vegetation

11.3.10.1 Affected Environment

Revisions to the boundaries of the proposed Dry Lake SEZ have eliminated a large portion of the wetland mapped by the NWI and playa in the SEZ. In addition, 469 acres (2 km^2), consisting of the remaining area of wetland and playa within the SEZ as well as the two predominant washes inflowing from the south, were identified as non-development areas.

As presented in Section 11.3.10.1 of the Draft Solar PEIS, 6 cover types were identified within the area of the proposed Dry Lake SEZ, while 12 cover types were identified in the area of indirect impacts. Sensitive habitats on the SEZ include desert chenopod scrub/mixed salt desertscrub, desert dry washes, dry wash woodland, wetland, and playa. A characteristic species of the Mojave Desert that is present on the SEZ is Mojave yucca (*Yucca schidigera*). Because of the SEZ boundary changes, the North American Warm Desert Playa cover type no longer occurs within the SEZ. Figure 11.3.10.1-1 shows the cover types within the affected area of the Dry Lake SEZ as revised.

11.3.10.2 Impacts

As presented in the Draft Solar PEIS, the construction of solar energy facilities within the proposed Dry Lake SEZ would result in direct impacts on plant communities because of the removal of vegetation within the facility footprint during land-clearing and land-grading operations. Approximately 80% of the SEZ would be expected to be cleared with full development of the SEZ. As a result of the changes to the proposed SEZ boundaries, approximately 4,574 acres (19 km^2) would be cleared.

Overall impact magnitude categories were based on professional judgment and include (1) *small*: a relatively small proportion (≤1%) of the cover type within the SEZ region would be lost; (2) *moderate*: an intermediate proportion (>1 but ≤10%) of a cover type would be lost; and (3) *large*: >10% of a cover type would be lost.

11.3.10.2.1 Impacts on Native Species

The analysis presented in the Draft Solar PEIS for the original Dry Lake SEZ boundaries indicated that development would result in a moderate impact on one land cover type and a small impact on all other land cover types occurring within the SEZ (Table 11.3.10.1-1 in the Draft Solar PEIS). Development within the revised Dry Lake SEZ could still directly affect

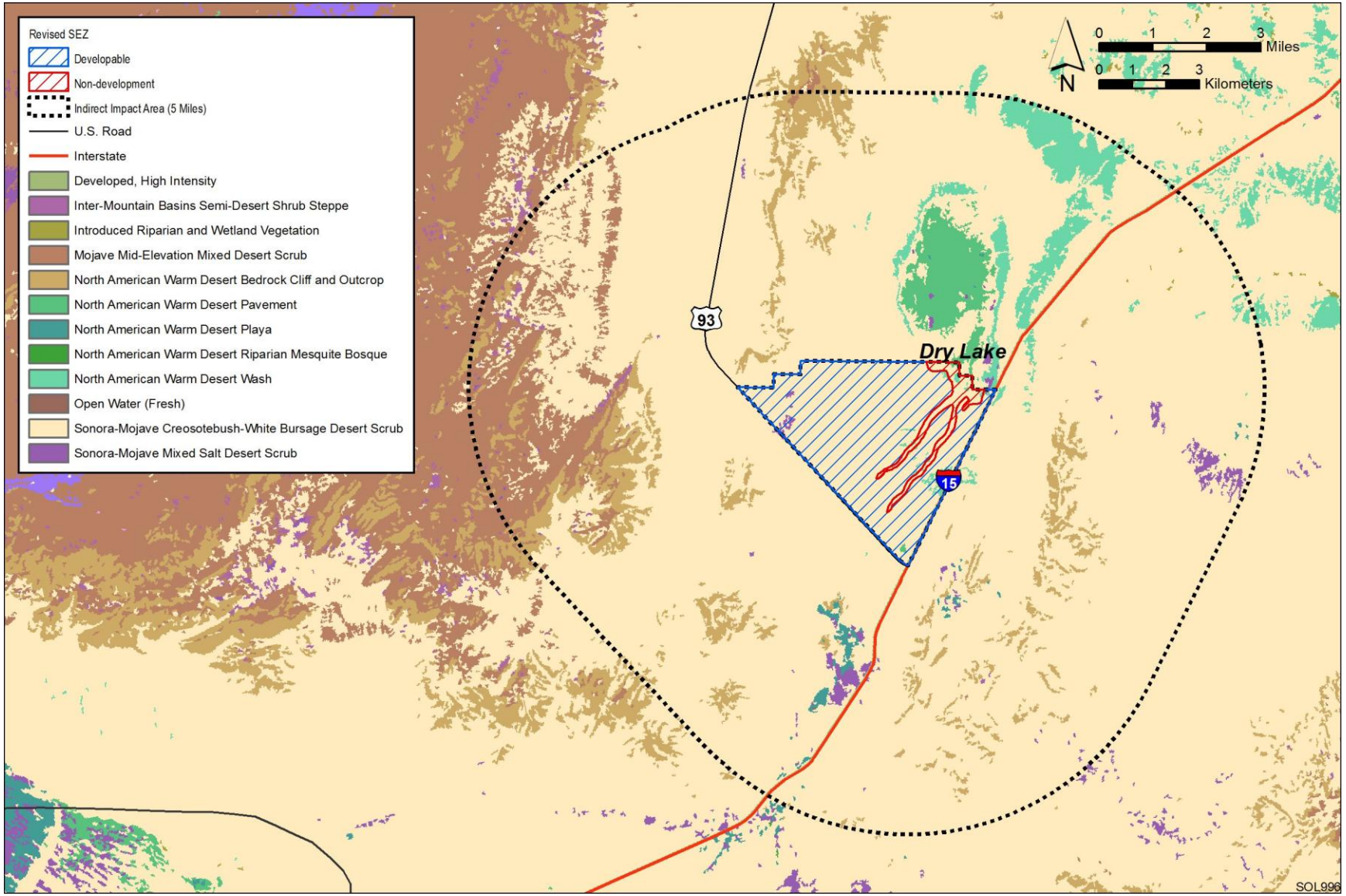

FIGURE 11.3.10.1-1 Land Cover Types within the Proposed Dry Lake SEZ as Revised

most of the cover types evaluated in the Draft Solar PEIS, with the exception of North American Warm Desert Playa. The reduction in the developable area would result in reduced impact levels on all cover types in the affected area. The impact magnitude for North American Warm Desert Pavement would change from moderate to small. The impact magnitudes for all other land cover types would remain unchanged compared to original estimates in the Draft Solar PEIS.

Indirect impacts on habitats associated with Dry Lake playa within or near the SEZ, as described in the Draft Solar PEIS, could occur. The indirect impacts from groundwater use, on plant communities in the region that depend on groundwater, could also occur.

11.3.10.2.2 Impacts from Noxious Weeds and Invasive Plant Species

As presented the Draft Solar PEIS, land disturbance from project activities and indirect effects of construction and operation within the Dry Lake SEZ could potentially result in the establishment or expansion of noxious weeds and invasive species populations, potentially including those species listed in Section 11.3.10.1 of the Draft Solar PEIS. Impacts, such as reduced restoration success and possible widespread habitat degradation, could still occur; however, a small reduction in the potential for such impacts would result from the reduced developable area of the SEZ.

11.3.10.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features are described in Section A.2.2 of Appendix A of this Final Solar PEIS. SEZ-specific species and habitats will determine how programmatic design features are applied, for example:

- All dry wash, dry wash woodland, and chenopod scrub communities within the SEZ shall be avoided to the extent practicable, and any impacts minimized and mitigated in consultation with appropriate agencies. Any yucca, cacti, or succulent plant species that cannot be avoided should be salvaged. A buffer area shall be maintained around dry wash, dry wash woodland, playa, and wetland habitats to reduce the potential for impacts.

- Appropriate engineering controls shall be used to minimize impacts on dry wash, dry wash woodland, wetland, and playa habitats, including downstream occurrences, resulting from surface water runoff, erosion, sedimentation, altered hydrology, accidental spills, or fugitive dust deposition. Appropriate buffers and engineering controls will be determined through agency consultation.

- Groundwater withdrawals shall be limited to reduce the potential for indirect impacts on groundwater-dependent communities, such as mesquite communities. Potential impacts on springs shall be determined through hydrological studies.

It is anticipated that implementation of these programmatic design features will reduce a high potential for impacts from invasive species and impacts on dry wash, dry wash woodland, chenopod scrub, mesquite bosque, riparian, wetland, and playa communities and springs to a minimal potential for impact. Residual impacts on groundwater dependent habitats could result from limiting groundwater withdrawal, and so forth; however, it is anticipated that these impacts would be avoided in the majority of instances.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for vegetation have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

11.3.11 Wildlife and Aquatic Biota

For the assessment of potential impacts on wildlife and aquatic biota, overall impact magnitude categories were based on professional judgment and include (1) *small*: a relatively small proportion (≤1%) of the species' habitat within the SEZ region would be lost; (2) *moderate*: an intermediate proportion (>1 but ≤10%) of the species' habitat would be lost; and (3) *large*: >10% of the species' habitat would be lost.

11.3.11.1 Amphibians and Reptiles

11.3.11.1.1 Affected Environment

As presented in Section 11.3.11.1 of the Draft Solar PEIS, representative amphibian and reptile species expected to occur within the Dry Lake SEZ include the Great Plains toad (*Bufo cognatus*), red-spotted toad (*Bufo punctatus*), desert horned lizard (*Phrynosoma platyrhinos*), Great Basin collared lizard (*Crotaphytus bicinctores*), long-nosed leopard lizard (*Gambelia wislizenii*), side-blotched lizard (*Uta stansburiana*), western fence lizard (*Sceloporus occidentalis*), western whiptail (*Cnemidophorus tigris*), zebra-tailed lizard (*Callisaurus draconoides*), coachwhip (*Masticophis flagellum*), common kingsnake (*Lampropeltis getula*), glossy snake (*Arizona elegans*), gophersnake (*Pituophis catenifer*), groundsnake (*Sonora semiannulata*), long-nosed snake (*Rhinocheilus lecontei*), nightsnake (*Hypsiglena torquata*), Mojave rattlesnake (*Crotalus scutulatus*), and sidewinder (*Crotalus cerastes*). The reduction in the size of the Dry Lake SEZ does not alter the potential for these species to occur in the affected area.

11.3.11.1.2 Impacts

As presented in the Draft Solar PEIS, solar energy development within the Dry Lake SEZ could affect potentially suitable habitats for the representative amphibian and reptile species. The

analysis presented in the Draft Solar PEIS for the original Dry Lake SEZ boundaries indicated that development would result in a small overall impact on all representative amphibian and reptile species (Table 11.3.11.1-1 in the Draft Solar PEIS). The reduction in the developable area of the Dry Lake SEZ would result in reduced habitat impacts for all representative amphibian and reptile species; the resultant impact levels for all of the representative species would still be small.

11.3.11.1.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features are described in Section A.2.2 of Appendix A of this Final Solar PEIS. With the implementation of required programmatic design features, impacts on amphibian and reptile species are anticipated to be small.

Because of the changes to the SEZ boundaries, the SEZ-specific design feature identified in Section 11.3.11.1.3 of the Draft Solar PEIS (i.e., dry lake and wash habitats should be avoided) is no longer applicable. On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for amphibians and reptiles have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

11.3.11.2 Birds

11.3.11.2.1 Affected Environment

As presented in Section 11.3.11.2.1 of the Draft Solar PEIS, a large number of bird species could occur or have potentially suitable habitat within the affected area of the proposed Dry Lake SEZ. Representative bird species identified in the Draft Solar PEIS included (1) shorebirds: killdeer (*Charadrius vociferus*); (2) passerines: ash-throated flycatcher (*Myiarchus cinerascens*), Bewick's wren (*Thryomanes bewickii*), black-tailed gnatcatcher (*Polioptila melanura*), black-throated sparrow (*Amphispiza bilineata*), common poorwill (*Phalaenoptilus nuttallii*), common raven (*Corvus corax*), Costa's hummingbird (*Calypte costae*), crissal thrasher (*Toxostoma crissale*), greater roadrunner (*Geococcyx californianus*), horned lark (*Eremophila alpestris*), ladder-backed woodpecker (*Picoides scalaris*), Le Conte's thrasher (*Toxostoma lecontei*), lesser nighthawk (*Chordeiles acutipennis*), loggerhead shrike (*Lanius ludovicianus*), Lucy's warbler (*Vermivora luciae*), northern mockingbird (*Mimus polyglottos*), rock wren (*Salpinctes obsoletus*), sage sparrow (*Amphispiza belli*), Say's phoebe (*Sayornis saya*), verdin (*Auriparus flaviceps*), and western kingbird (*Tyrannus verticalis*); (3) raptors: American kestrel (*Falco sparverius*), golden eagle (*Aquila chrysaetos*), great horned owl (*Bubo virginianus*), long-eared owl (*Asio otus*), red-tailed hawk (*Buteo jamaicensis*), and turkey vulture (*Cathartes aura*); and (4) upland gamebirds: chukar (*Alectoris chukar*), Gambel's quail (*Callipepla gambelii*), mourning dove (*Zenaida macroura*), and white-winged dove

(*Zenaida asiatica*). The reduction in the size of the Dry Lake SEZ does not alter the potential for these species or other bird species to occur in the affected area.

11.3.11.2.2 Impacts

As presented in the Draft Solar PEIS, solar energy development within the Dry Lake SEZ could affect potentially suitable bird habitats. The analysis presented in the Draft Solar PES based on the original Dry Lake SEZ boundaries indicated that development would result in a small overall impact on all representative bird species (Table 11.3.11.2-1 in the Draft Solar PEIS). The reduction in the developable area of the Dry Lake SEZ would result in reduced habitat impacts for all representative bird species; however, the resultant impact levels for all of the representative bird species would still be small.

11.3.11.2.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features are described in Section A.2.2 of Appendix A of this Final Solar PEIS. With the implementation of required programmatic design features, impacts on bird species are anticipated to be small.

Because of the change in boundaries of the SEZ, the SEZ-specific design feature identified in Section 11.3.11.2.3 of the Draft Solar PEIS (i.e., dry lake and wash habitats should be avoided) is no longer applicable. On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for birds have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

11.3.11.3 Mammals

11.3.11.3.1 Affected Environment

As presented in Section 11.3.11.3.1 of the Draft Solar PEIS, a large number of mammal species were identified that could occur or have potentially suitable habitat within the affected area of the proposed Dry Lake SEZ. Representative mammal species identified in the Draft Solar PEIS included (1) big game species: cougar (*Puma concolor*) and mule deer (*Odocoileus hemionus*); (2) furbearers and small game species: the American badger (*Taxidea taxus*), black-tailed jackrabbit (*Lepus californicus*), bobcat (*Lynx rufus*), coyote (*Canis latrans*, common), desert cottontail (*Sylvilagus audubonii*), gray fox (*Urocyon cinereoargenteus*), kit fox (*Vulpes macrotis*), and red fox (*Vulpes vulpes*); and (3) small nongame species: Botta's pocket gopher (*Thomomys bottae*), cactus mouse (*Peromyscus eremicus*), canyon mouse (*P. crinitis*), deer mouse (*P. maniculatus*), desert kangaroo rat (*Dipodomys deserti*), desert shrew (*Notiosorex crawfordi*), desert woodrat (*Neotoma lepida*), little pocket mouse (*Perognathus longimembris*),

long-tailed pocket mouse (*Chaetodipus formosus*), Merriam's pocket mouse (*Dipodomys merriami*), northern grasshopper mouse (*Onychomys leucogaster*), southern grasshopper mouse (*O. torridus*), western harvest mouse (*Reithrodontomys megalotis*), and white-tailed antelope squirrel (*Ammospermophilus leucurus*). Bat species that may occur within the area of the SEZ include the big brown bat (*Eptesicus fuscus*), Brazilian free-tailed bat (*Tadarida brasiliensis*), California myotis (*Myotis californicus*), hoary bat (*Lasiurus cinereus*), long-legged myotis (*M. volans*), silver-haired bat (*Lasionycteris noctivagans*), and western pipistrelle (*Parastrellus hesperus*). The reduction in the size of the Dry Lake SEZ does not alter the potential for these species or any additional mammal species to occur in the affected area.

11.3.11.3.2 Impacts

As presented in the Draft Solar PEIS, solar energy development within the Dry Lake SEZ could affect potentially suitable habitats of mammal species. The analysis presented in the Draft Solar PEIS based on the original Dry Lake SEZ boundaries indicated that development would result in a small overall impact on all representative mammal species analyzed (Table 11.3.11.3-1 in the Draft Solar PEIS). The reduction in the developable area of the Dry Lake SEZ would result in reduced habitat impacts for all representative mammal species; resultant impact levels for all of the representative mammal species would still be small.

11.3.11.3.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on mammals are described in Section A.2.2 of Appendix A of this Final Solar PEIS. With the implementation of required programmatic design features and the applicable SEZ-specific design features, impacts on mammal species will be reduced.

Because of the change in boundaries of the SEZ, one of the SEZ-specific design features identified in Section 11.3.11.3.3 of the Draft Solar PEIS (i.e., playa and wash habitats should be avoided) is no longer applicable. On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, the following SEZ-specific design feature has been identified:

- To the extent practicable, the fencing around the solar energy development should not block the free movement of mammals, particularly big game species.

If this SEZ-specific design feature is implemented in addition to required programmatic design features, impacts on mammal species are anticipated to be small. The need for additional SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

11.3.11.4 Aquatic Biota

11.3.11.4.1 Affected Environment

There are no perennial surface water bodies, wetlands, or streams within the proposed Dry Lake SEZ. The boundaries of the Dry Lake SEZ have been reduced compared to the boundaries given in the Draft Solar PEIS. On the basis of these changes, updates to the Draft Solar PEIS include:

- Approximately 218 acres (1 km^2) of Dry Lake are located within the SEZ. However, only 74 acres (<1 km^2) are located within a development area.

- There are 3,507 acres (14 km^2) of dry lakes present in the area of indirect effects within 5 mi (8 km) of the SEZ, along with associated wetlands. Portions of two intermittent streams (California Wash and Gypsum Wash) totaling 3 mi (5 km) are present within the area of indirect effects (within 5 mi [8 km] of the SEZ).

- Outside of the potential indirect effects area but within 50 mi (80 km) of the SEZ, there are 130,098 acres (526 km^2) of permanent lake (Lake Mead), 12,030 acres (49 km^2) of the Colorado River, and 44,410 (180 km^2) of dry lake. There are also several stream features, including 125 mi (201 km) of perennial streams and 273 mi (439 km) of intermittent streams.

There is no information on aquatic biota in the surface water features in the SEZ. As stated in Appendix C of the Supplement to the Draft Solar PEIS, site surveys can be conducted at the project-specific level to characterize the aquatic biota, if present.

11.3.11.4.2 Impacts

The types of impacts on aquatic habitats and biota that could occur from development of utility-scale solar energy facilities are discussed in Section 5.10.3 of the Draft and Final Solar PEIS. Aquatic habitats, including wetland areas, present on or near the Dry Lake SEZ could be affected by solar energy development in a number of ways, including (1) direct disturbance, (2) deposition of sediments, (3) changes in water quantity, and (4) degradation of water quality. The impact assessment provided in the Draft Solar PEIS remains valid, with the following updates:

- The amount of surface water features within the SEZ and in the area of indirect effects that could potentially be affected by solar energy development is less because the size of the SEZ has been reduced.

- Most of Dry Lake has been eliminated from the SEZ boundary; therefore, impacts on Dry Lake from construction activities would be less than assumed in the Draft Solar PEIS.

11.3.11.4.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on aquatic species are described in Section A.2.2 of Appendix A of this Final Solar PEIS. SEZ-specific resources and conditions will determine how programmatic design features are applied, for example:

- Appropriate engineering controls shall be implemented to minimize the amount of surface water runoff, contaminants, and fugitive dust reaching Dry Lake, California Wash, and Gypsum Wash.

- Development shall avoid any additional wetlands identified during future site-specific fieldwork.

- The impact of groundwater withdrawals on streams near the SEZ, such as the Muddy River, and on springs, such as those along the north shore of Lake Meade and within the Desert NWR and Moapa NWR, shall be minimized or eliminated.

It is anticipated that implementation of the programmatic design features will reduce impacts on aquatic biota, and if the utilization of water from groundwater or surface water sources is adequately controlled to maintain sufficient water levels in nearby aquatic habitats, the potential impacts on aquatic biota from solar energy development at the Dry Lake SEZ would be small.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for aquatic biota have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

11.3.12 Special Status Species

11.3.12.1 Affected Environment

As presented in Section 11.3.12.1 of the Draft Solar PEIS, 62 special status species were identified that could occur or have potentially suitable habitat within the affected area of the proposed Dry Lake SEZ. The reduction in the size of the Dry Lake SEZ does not alter the potential for these species to occur in the affected area. Figure 11.3.12.1-1 shows the known or potential occurrences of species in the revised affected area of the Dry Lake SEZ that are listed, proposed, or candidates for listing under the ESA. There is no change in the number of

groundwater-dependent species that may be affected by solar energy development on the revised SEZ. Impacts on groundwater-dependent species are discussed in the Draft Solar PEIS; updated information regarding impacts on these species is provided in Section 11.3.12.2. Groundwater-dependent species are not further discussed here because the changes to the SEZ boundary are not assumed to alter the impact determination for groundwater-dependent species.

Following the Draft Solar PEIS, additional information provided by the USFWS indicated that the revised Dry Lake SEZ was situated in an area that provides habitat and genetic connectivity between areas with greater habitat suitability, particularly between the Mormon Mesa Critical Habitat Unit west of the SEZ and portions of greater habitat suitability north and east of the SEZ (Figure 11.3.12.1-1). The USFWS identified the entire revised SEZ as priority connectivity habitat for the desert tortoise through a least-cost pathway model (Ashe 2012) based upon the USGS model for desert tortoise predicted suitable habitat (Nussear et al. 2009).

Since publication of the Draft Solar PEIS, 11 additional special status species have been identified that could potentially occur in the affected area, based on county-level occurrences and the presence of potentially suitable habitat. These 11 special status species are all designated sensitive species by the Nevada BLM Office and include (1) plants: sticky ringstem; (2) birds: golden eagle, gray vireo, loggerhead shrike, long-eared owl, and Lucy's warbler, and (3) mammals: big brown bat, California myotis, hoary bat, long-legged myotis, and western pipistrelle. These additional species are discussed in the following paragraphs.

Sticky Ringstem. The sticky ringstem is a perennial herb that is designated as a sensitive species by the Nevada BLM. This species was not analyzed for the Dry Lake SEZ in the Draft Solar PEIS. It is known from southern Nevada, portions of northern Arizona, New Mexico, Texas, and Mexico. In Nevada, it is primarily known from the Frenchman Mountain area east of Las Vegas and further east to the Muddy Mountains and Gold Butte (VRHCRP 2012). This species occupies soils composed of calcareous shales and clay, loose talus, and gypsum at elevations between 1,700 and 4,000 ft (518 and 1,219 m). It is commonly associated with the Las Vegas bearpoppy. The sticky ringstem is known to occur in Clark County, Nevada, and potentially suitable habitat for this species could occur on the SEZ and portions of the area of indirect effects (Table 11.3.12.1-1).

Golden Eagle. The golden eagle is an uncommon to common permanent resident in southern Nevada. This species was not analyzed for the Dry Lake SEZ in the Draft Solar PEIS. The species inhabits rolling foothills, mountain areas, and desert shrublands. It nests on cliff faces and in large trees in open areas. Potentially suitable foraging habitat for this species may occur in the revised area of the SEZ and throughout the area of indirect effects (Table 11.3.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable nesting habitat (cliffs and rock outcrops) does not occur in the revised area of the SEZ or within the area of indirect effects (Table 11.3.12.1-1).

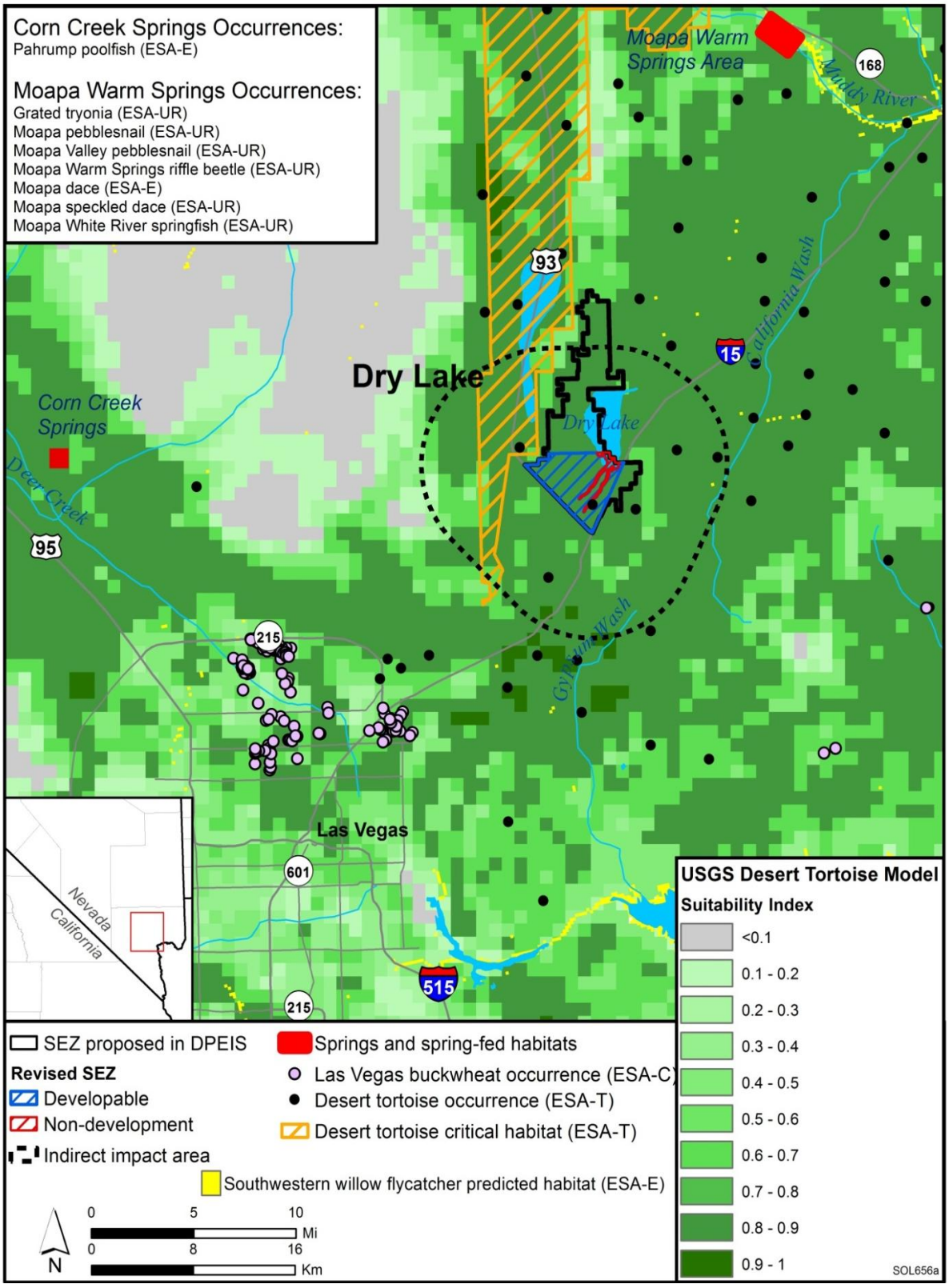

FIGURE 11.3.12.1-1 Proposed Dry Lake SEZ as Revised and Distribution of Potentially Suitable Habitat for Species Listed under the Endangered Species Act

TABLE 11.3.12.1-1 Habitats, Potential Impacts, and Potential Mitigation for Special Status Species That Could Be Affected by Solar Energy Development on the Proposed Dry Lake SEZ as Revised[a]

Common Name	Scientific Name	Listing Status[b]	Habitat[c]	Maximum Area of Potential Habitat Affected[d]		Overall Impact Magnitude[g] and Species-Specific Mitigation[h]
				Within SEZ (Direct Effects)[e]	Outside SEZ (Indirect Effects)[f]	
Plants						
Sticky ringstem	*Anulocaulis leisolenus*	BLM-S; NV-S2	Known from southern Nevada, northern Arizona, and New Mexico, Texas, and Mexico. Occupies loose soils of calcareous shales and clay, loose talus, and gypsum at elevations between 1,700 and 4,000 ft.[i] About 65,400 acres[j] of potentially suitable habitat occurs in the SEZ region.	425 acres of potentially suitable habitat lost (0.7% of available potentially suitable habitat)	1,250 acres of potentially suitable habitat (1.9% of available potentially suitable habitat)	Small overall impact. Avoiding or minimizing disturbance to desert pavement habitat on the SEZ could reduce impacts. In addition, pre-disturbance surveys and avoiding or minimizing disturbance to occupied habitats in the areas of direct effects, translocation of individuals from areas of direct effects, or compensatory mitigation of direct effects on occupied habitats could reduce impacts.
Birds						
Golden eagle	*Aquila chrysaetos*	BLM-S	An uncommon to common permanent resident and migrant in southern Nevada. Habitat includes rolling foothills, mountain areas, and desert shrublands. Nests on cliff faces and in large trees in open areas. About 4,500,000 acres of potentially suitable habitat occurs within the SEZ region.	5,665 acres of potentially suitable habitat lost (0.1% of available potentially suitable habitat)	92,000 acres of potentially suitable habitat (2.0% of available potentially suitable habitat)	Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects.
Gray vireo	*Vireo vicinior*	BLM-S	An uncommon summer resident in arid environments such as pinyon-juniper, chaparral, and desert shrublands. Builds open-cup nests of plant material in forked branches of shrubs or small trees. About 650,000 acres of potentially suitable habitat occurs within the SEZ region.	0 acres	8,250 acres of potentially suitable habitat (1.3% of available potentially suitable habitat)	Small overall impact; no direct effects. No species-specific mitigation is warranted.

TABLE 11.3.12.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]	Maximum Area of Potential Habitat Affected[d]		Overall Impact Magnitude[g] and Species-Specific Mitigation[h]
				Within SEZ (Direct Effects)[e]	Outside SEZ (Indirect Effects)[f]	
Birds (Cont.)						
Loggerhead shrike	*Lanius ludovicianus*	BLM-S	A common winter resident in lowlands and foothills in southern Nevada. Prefers open habitats with shrubs, trees, utility lines, or other perches. Highest density occurs in open-canopied foothill forests. About 2,000,000 acres of potentially suitable habitat occurs within the SEZ region.	0 acres	14,250 acres of potentially suitable habitat (0.7% of available potentially suitable habitat)	Small overall impact; no direct effects. No species-specific mitigation is warranted.
Long-eared owl	*Asio otus*	BLM-S	An uncommon year-long resident in southern Nevada. Occurs in desert shrubland environments in proximity to riparian areas such as desert washes. Nests in trees using old nests from other birds or squirrels. About 4,100,000 acres of potentially suitable habitat occurs within the SEZ region.	5,580 acres of potentially suitable habitat lost (0.1% of available potentially suitable habitat)	82,700 acres of potentially suitable habitat (2.0% of available potentially suitable habitat)	Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects.

TABLE 11.3.12.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]	Maximum Area of Potential Habitat Affected[d]		Overall Impact Magnitude[g] and Species-Specific Mitigation[h]
				Within SEZ (Direct Effects)[e]	Outside SEZ (Indirect Effects)[f]	
Birds (Cont.)						
Lucy's warbler	*Vermivora luciae*	BLM-S	An uncommon summer resident and breeder in desert riparian areas. Occurs in desert wash habitats, especially those dominated by mesquite and saltcedar. Nests in tiny cavities in riparian woodlands. About 81,000 acres of potentially suitable habitat occurs within the SEZ region.	43 acres of potentially suitable habitat lost (0.1% of available potentially suitable habitat)	2,500 acres of potentially suitable habitat (3.1% of available potentially suitable habitat)	Small to large overall impact. Potentially suitable nesting habitat in riparian habitats in the Moapa and Pahranagat Valleys may be affected by groundwater withdrawal. The impact of water withdrawal on the Garnet Valley regional groundwater system that supports aquatic and mesic habitat in the SEZ region would depend on the volume of water withdrawn to support solar energy development on the SEZ. Avoiding or limiting withdrawals from this regional groundwater system could reduce impacts on this species to negligible levels. In addition, pre-disturbance surveys and avoidance or minimization of disturbance to occupied habitats (especially nesting habitats) on the SEZ or compensatory mitigation of direct effects on occupied habitats on the SEZ could reduce impacts. The potential for impact and need for mitigation should be determined in coordination with the USFWS and the NDOW.

TABLE 11.3.12.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]	Maximum Area of Potential Habitat Affected[d]		Overall Impact Magnitude[g] and Species-Specific Mitigation[h]
				Within SEZ (Direct Effects)[e]	Outside SEZ (Indirect Effects)[f]	
Mammals						
Big brown bat	*Eptesicus fuscus*	BLM-S	Occurs throughout the southwestern United States in various habitat types. Uncommon in hot desert environments, but may occur in areas in close proximity to water sources such as lakes and washes. Roosts in buildings, caves, mines, and trees. About 3,700,000 acres of potentially suitable habitat occurs within the SEZ region.	5,665 acres of potentially suitable habitat lost (0.2% of available potentially suitable habitat)	84,700 acres of potentially suitable habitat (2.3% of available potentially suitable habitat)	Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects.
California myotis	*Myotis californicus*	BLM-S	A common year-round resident in southern Nevada. Occurs in a variety of habitats, including desert, chaparral, woodlands, and forests. Roosts primarily in crevices but will also use buildings, mines, and hollow trees. About 3,500,000 acres of potentially suitable habitat occurs within the SEZ region.	5,625 acres of potentially suitable habitat lost (0.2% of available potentially suitable habitat)	85,700 acres of potentially suitable habitat (2.4% of available potentially suitable habitat)	Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects.
Hoary bat	*Lasiurus cinereus*	BLM-S	The most widespread North American bat species, occurs throughout southern Nevada in various habitat types. Occurs in habitats such as woodlands, foothills, desert shrublands, and chaparral. Roosts primarily in trees. About 3,500,000 acres of potentially suitable habitat occurs within the SEZ region.	5,665 acres of potentially suitable habitat lost (0.2% of available potentially suitable habitat)	83,700 acres of potentially suitable habitat (2.4% of available suitable habitat)	Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects.

TABLE 11.3.12.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]	Maximum Area of Potential Habitat Affected[d]		Overall Impact Magnitude[g] and Species-Specific Mitigation[h]
				Within SEZ (Direct Effects)[e]	Outside SEZ (Indirect Effects)[f]	
Mammals (Cont.)						
Long-legged myotis	*Myotis volans*	BLM-S	Common to uncommon year-round resident in southern Nevada. Uncommon in desert and arid grassland environments. Most common in woodlands above 4,000-ft elevation. Forages in chaparral, scrub, woodlands, and desert shrublands. Roosts in trees, caves, and crevices. About 3,700,000 acres of potentially suitable habitat occurs within the SEZ region.	5,580 acres of potentially suitable habitat lost (0.2% of available potentially suitable habitat)	83,200 acres of potentially suitable habitat (2.2% of available potentially suitable habitat)	Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects.
Western pipistrelle	*Pipistrellus Hesperus*	BLM-S	A common year-round resident of deserts, grasslands, and woodlands in southern Nevada. Occurs in various habitats, including mountain foothill woodlands, desert shrublands, desert washes, and pinyon-juniper woodlands. Roosts primarily in rock crevices; occasionally in mines and caves. About 4,800,000 acres of potentially suitable habitat occurs within the SEZ region.	5,710 acres of potentially suitable habitat lost (0.1% of available potentially suitable habitat)	93,000 acres of potentially suitable habitat (1.9% of available potentially suitable habitat)	Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects.

[a] The species presented in this table represent new species identified following publication of the Draft Solar PEIS or a re-evaluation of those species that were determined to have moderate or large impacts in the Draft Solar PEIS. The other special status species for this SEZ are identified in Table 11.3.12.1-1 of the Draft Solar PEIS.

[b] BLM-S = listed as sensitive by the BLM.

Footnotes continued on next page.

TABLE 11.3.12.1-1 (Cont.)

[c] Potentially suitable habitat was determined using SWReGAP habitat suitability models (USGS 2004, 2007). 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] Maximum area of potentially suitable habitat that could be affected relative to availability within the SEZ region. Habitat availability for each species within the region was determined by using SWReGAP habitat suitability models (USGS 2004, 2007). This approach probably overestimates the amount of suitable habitat in the project area.

[e] Direct effects within the SEZ consist of the ground-disturbing activities associated with construction and the maintenance of an altered environment associated with operations.

[f] Area of indirect effects was assumed to be the area adjacent to the SEZ within 5 mi (8 km) of the SEZ boundary where ground-disturbing activities would not occur. Indirect effects include effects from surface runoff, dust, noise, lighting, and so on from solar development. The potential degree of indirect effects would decrease with increasing distance away from the SEZ.

[g] Overall impact magnitude categories were based on professional judgment and are as follows: (1) *small*: ≤1% of the population or its habitat would be lost and the activity would not result in a measurable change in carrying capacity or population size in the affected area; (2) *moderate*: >1 but ≤10% of the population or its habitat would be lost and the activity would result in a measurable but moderate (not destabilizing) change in carrying capacity or population size in the affected area; (3) *large*: >10% of a population or its habitat would be lost and the activity would result in a large, measurable, and destabilizing change in carrying capacity or population size in the affected area. Note that much greater weight was given to the magnitude of direct effects because those effects would be difficult to mitigate. Design features would reduce most indirect effects to negligible levels.

[h] Species-specific mitigations are suggested here, but final mitigations should be developed in consultation with state and federal agencies and should be based on pre-disturbance surveys.

[i] To convert ft to m, multiply by 0.3048.

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

Gray Vireo. The gray vireo is an uncommon summer resident in southern Nevada. This species was not analyzed for the Dry Lake SEZ in the Draft Solar PEIS. The species occurs in arid environments such as pinyon-juniper, chaparral, and desert shrublands. It builds open-cup nests of plant material in forked branches of shrubs or small trees. On the basis of an evaluation of the SWReGAP habitat suitability model for this species, potentially suitable habitat does not occur in the revised area of the SEZ; however, potentially suitable breeding and nonbreeding habitat may occur outside the SEZ in the area of indirect effects (Table 11.3.12.1-1).

Loggerhead Shrike. The loggerhead shrike is a common winter resident in lowlands and foothills of southern Nevada. This species was not analyzed for the Dry Lake SEZ in the Draft Solar PEIS. The species occurs in open habitats with shrubs, trees, utility lines, or other perches. The highest densities of this species occur in open-canopied foothill forests. On the basis of an evaluation of the SWReGAP habitat suitability model for this species, potentially suitable habitat does not occur in the revised area of the SEZ; however, potentially suitable foraging habitat may occur outside the SEZ in the area of indirect effects (Table 11.3.12.1-1).

Long-Eared Owl. The long-eared owl is an uncommon year-round resident in southern Nevada. This species was not analyzed for the Dry Lake SEZ in the Draft Solar PEIS. The species inhabits desert shrubland environments in proximity to riparian areas such as desert washes. It nests in trees using old nests from other birds or squirrels. Potentially suitable foraging habitat for this species may occur in the revised area of the SEZ and throughout the area of indirect effects (Table 11.3.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable nesting habitat (forests) does not occur in the SEZ or within the area of indirect effects (Table 11.3.12.1-1).

Lucy's Warbler. The Lucy's warbler is an uncommon summer resident and breeder in desert riparian areas of southern Nevada. This species was not analyzed for the Dry Lake SEZ in the Draft Solar PEIS. The species inhabits desert wash habitats, especially those dominated by mesquite and saltcedar. It nests in tiny cavities in riparian woodlands. On the basis of an evaluation of the SWReGAP habitat suitability model for this species, potentially suitable habitat does not occur in the revised area of the SEZ; however, potentially suitable breeding and nonbreeding habitat may occur outside the SEZ in the area of indirect effects (Table 11.3.12.1-1).

Big Brown Bat. The big brown bat is a fairly common year-round resident in southern Nevada. This species was not analyzed for the Dry Lake SEZ in the Draft Solar PEIS. The big brown bat is uncommon in desert habitats but may occur in desert shrublands that are in close proximity to water sources. The species inhabits desert shrubland environments in proximity to riparian areas such as desert washes. It roosts in buildings, caves, mines, and trees. Potentially suitable foraging habitat for this species may occur in the revised area of the SEZ and throughout the area of indirect effects (Table 11.3.12.1-1). On the basis of an evaluation of SWReGAP land

cover types, potentially suitable roosting habitat (forests and rock outcrops) does not occur in the revised area of the SEZ or within the area of indirect effects (Table 11.3.12.1-1).

California Myotis. The California myotis is a fairly common year-round resident in southern Nevada. This species was not analyzed for the Dry Lake SEZ in the Draft Solar PEIS. The species inhabits desert, chaparral, woodlands, and forests. It roosts primarily in crevices but will also use buildings, mines, and hollow trees. Potentially suitable foraging habitat for this species may occur in the revised area of the SEZ and throughout the area of indirect effects (Table 11.3.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat (forests and rock outcrops) does not occur in the revised area of the SEZ or within the area of indirect effects (Table 11.3.12.1-1).

Hoary Bat. The hoary bat is a fairly common year-round resident in southern Nevada. This species was not analyzed for the Dry Lake SEZ in the Draft Solar PEIS. The species inhabits woodlands, foothills, desert shrublands, and chaparral. It roosts primarily in trees. Potentially suitable foraging habitat for this species may occur in the revised area of the SEZ and throughout the area of indirect effects (Table 11.3.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat (forests) does not occur in the revised area of the SEZ or within the area of indirect effects (Table 11.3.12.1-1).

Long-Legged Myotis. The long-legged myotis is a common to uncommon year-round resident in southern Nevada. This species was not analyzed for the Dry Lake SEZ in the Draft Solar PEIS. This species is uncommon in desert and arid grassland environments and most common in woodlands above 4,000-ft elevation. It forages in chaparral, scrub, woodlands, and desert shrublands and roosts in trees, caves, and crevices. Potentially suitable foraging habitat for this species may occur in the revised area of the SEZ and throughout the area of indirect effects (Table 11.3.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat (forests and rock outcrops) does not occur in the revised area of the SEZ or within the area of indirect effects (Table 11.3.12.1-1).

Western Pipistrelle. The western pipistrelle is a common year-round resident in southern Nevada. This species was not analyzed for the Dry Lake SEZ in the Draft Solar PEIS. The species inhabits mountain foothill woodlands, desert shrublands, desert washes, and pinyon-juniper woodlands. It roosts primarily in rock crevices and occasionally in mines and caves. Potentially suitable foraging habitat for this species may occur in the revised area of the SEZ and throughout the area of indirect effects (Table 11.3.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat (rock outcrops) does not occur in the revised area of the SEZ or within the area of indirect effects (Table 11.3.12.1-1).

11.3.12.2 Impacts

Overall impact magnitude categories were based on professional judgment and include (1) *small*: a relatively small proportion (≤1%) of the special status species' habitat within the SEZ region would be lost; (2) *moderate*: an intermediate proportion (>1 but ≤10%) of the special status species' habitat would be lost; and (3) *large*: >10% of the special status species' habitat would be lost.

As presented in the Draft Solar PEIS, solar energy development within the Dry Lake SEZ could affect potentially suitable habitats of special status species. The analysis presented in the Draft Solar PEIS for the original Dry Lake SEZ boundaries indicated that development would result in no impact or a small overall impact on all special status species, except those that are groundwater-dependent (Table 11.3.12.1-1 in the Draft Solar PEIS). In the Draft Solar PEIS, those special status species that could be affected by groundwater withdrawals on the SEZ were determined to have impacts that ranged from small to large depending upon the scale of development and water needs to serve development on the SEZ. Development within the revised area of the Dry Lake SEZ could still affect the same 62 species evaluated in the Draft Solar PEIS; however, the reduction in the developable area would result in reduced (and still small) impact levels compared to original estimates in the Draft Solar PEIS. Pre-disturbance consultation with the BLM and the necessary state and federal agencies should be conducted to determine the project-specific water needs and the potential for impact on these species (these groundwater-dependent species are listed in Table 11.3.12.1-1 of the Draft Solar PEIS and are listed in Section 11.3.12.3).

In the Draft Solar PEIS, it was determined that solar energy development within the Dry Lake SEZ would have a small overall effect on the desert tortoise. Impacts on this species are not requantified in this update for the Final Solar PEIS because it is expected that the overall impact will remain small. Following publication of the Draft Solar PEIS, the USFWS has identified the revised SEZ as being situated in an area that provides habitat and genetic connectivity between areas with greater habitat suitability (Ashe 2012). The USFWS has also determined that the revised SEZ is within high-priority connectivity areas, which are necessary to facilitate natural processes of gene exchange between populations in order to maintain population viability. Solar energy development on the Dry Lake SEZ, therefore, may isolate and fragment these tortoise populations by creating impediments to natural migration patterns.

Development of actions to reduce impacts (e.g., reasonable and prudent alternatives, reasonable and prudent measures, and terms and conditions) on the desert tortoise would require formal consultation with the USFWS under Section 7 of the ESA. This project-level consultation will tier from the programmatic ESA Section 7 consultation that will be completed with the PEIS ROD. Priority should be given to the development of a thorough survey protocol and measures to avoid impacts on known tortoise populations. If necessary, minimization measures and mitigation measures, which could potentially include translocation actions and compensatory mitigation, may be required. These consultations may be used to authorize incidental take statements per Section 10 of the ESA (if necessary). Consultation with the NDOW should also occur to determine any state mitigation requirements.

Inherent dangers to tortoises are associated with their capture, handling, and translocation from the SEZ. These actions, if conducted improperly, can result in injury or death. To minimize these risks and as stated above, the desert tortoise translocation plan should be developed in consultation with the USFWS and should follow the *Guidelines for Handling Desert Tortoises during Construction Projects* (Desert Tortoise Council 1994) and other current translocation guidance provided by the USFWS. Consultation will identify potentially suitable recipient locations, density thresholds for tortoise populations in recipient locations, and procedures for pre-disturbance clearance surveys and tortoise handling, as well as disease-testing and post-translocation monitoring and reporting requirements. Despite some risk of mortality or decreased fitness, translocation is widely accepted as a useful strategy for the conservation of the desert tortoise (Field et al. 2007).

To offset impacts of solar development on the SEZ, compensatory mitigation may be needed to balance the acreage of habitat lost with acquisition of lands that would be improved and protected for desert tortoise populations (USFWS 1994). Compensation can be accomplished by improving the carrying capacity for the desert tortoise on the acquired lands. Other mitigation actions may include funding for the habitat enhancement of the desert tortoise on existing federal lands. Consultation with the USFWS and NDOW would be necessary to determine the appropriate mitigation ratio to acquire, enhance, and preserve desert tortoise compensation lands.

In addition, impacts on the 11 BLM-designated sensitive species that were not evaluated for the Dry Lake SEZ in the Draft Solar PEIS are discussed below and in Table 11.3.12.1-1. The impact assessment for these additional species was carried out in the same way as the impact assessment for those species analyzed in the Draft Solar PEIS (Section 11.3.12.2).

Sticky Ringstem. The sticky ringstem was not analyzed for the Dry Lake SEZ in the Draft Solar PEIS. According to the SWReGAP land cover model, approximately 425 acres (2 km^2) of potentially suitable desert pavement habitat on the revised SEZ may be directly affected by construction and operations of solar energy development (Table 11.3.12.1-1). This direct effects area represents about 0.7% of available suitable habitat in the SEZ region. About 1,250 acres (5 km^2) of potentially suitable habitat occurs in the area of potential indirect effects; this area represents about 1.9% of the available potentially suitable habitat in the SEZ region (Table 11.3.12.1-1).

The overall impact on the sticky ringstem from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised area of the Dry Lake SEZ is considered small, because less than 1% of potentially suitable habitat for this species occurs in the area of direct effects. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts to negligible levels.

Avoiding or minimizing disturbance to desert pavement habitat on the SEZ could reduce direct impacts on this species to negligible levels. Impacts may also be reduced by conducting pre-disturbance surveys and avoiding or minimizing disturbance to occupied habitats in the area of direct effects. If avoidance or minimization is not feasible, plants could be translocated from the area of direct effects to protected areas that would not be affected directly or indirectly by

future development. Alternatively, or in combination with translocation, a compensatory mitigation plan could be developed and implemented to mitigate direct effects on occupied habitats. Compensation could involve the protection and enhancement of existing occupied or suitable habitats to compensate for habitats lost to development. A comprehensive mitigation strategy that uses one or more of these options could be designed to completely offset the impacts of development.

Golden Eagle. The golden eagle was not analyzed for the Dry Lake SEZ in the Draft Solar PEIS. This species is an uncommon to common permanent resident in southern Nevada, and potentially suitable foraging habitat is expected to occur in the revised affected area of the Dry Lake SEZ. Approximately 5,665 acres (23 km^2) of potentially suitable foraging habitat in the revised area of the SEZ could be directly affected by construction and operations (Table 11.3.12.1-1). This direct impact area represents 0.1% of potentially suitable habitat for the golden eagle in the SEZ region. About 92,000 acres (372 km^2) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 2.0% of the available suitable foraging habitat in the SEZ region (Table 11.3.12.1-1). Most of this area could serve as foraging habitat (open shrublands). On the basis of an evaluation of SWReGAP land cover types, potentially suitable nesting habitat (cliffs and rock outcrops) does not occur in the SEZ or within the area of indirect effects.

The overall impact on the golden eagle from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised area of the Dry Lake SEZ is considered small because the amount of potentially suitable foraging habitat for this species in the area of direct effects represents less than 1% of potentially suitable foraging habitat in the SEZ region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of direct impacts on all potentially suitable foraging habitat is not a feasible way to mitigate impacts on the golden eagle because potentially suitable shrubland is widespread throughout the area of direct effects and readily available in other portions of the affected area.

Gray Vireo. The gray vireo was not analyzed for the Dry Lake SEZ in the Draft Solar PEIS. This species is an uncommon summer resident in southern Nevada. The gray vireo is not known to occur on the revised area of the Dry Lake SEZ, and suitable habitat is not expected to occur on the SEZ. However, on the basis of an evaluation of the SWReGAP habitat suitability model for this species, approximately 8,250 acres (33 km^2) of potentially suitable breeding and nonbreeding habitat may occur outside the SEZ in the area of indirect effects. This area represents about 1.3% of the potentially suitable foraging habitat in the SEZ region (Table 11.3.12.1-1).

The overall impact on the gray vireo from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised Dry Lake SEZ is considered small because no potentially suitable habitat for this species occurs in the area of direct effects, and only indirect effects are possible. The implementation of programmatic design features may be sufficient to reduce indirect impacts on this species to negligible levels.

Loggerhead Shrike. The loggerhead shrike was not analyzed for the Dry Lake SEZ in the Draft Solar PEIS. This species is a common winter resident in lowlands and foothills of southern Nevada. The loggerhead shrike is not known to occur in the revised area of the Dry Lake SEZ, and suitable habitat is not expected to occur on the SEZ. However, on the basis of an evaluation of the SWReGAP habitat suitability model for this species, approximately 14,250 acres (58 km^2) of potentially suitable foraging habitat may occur outside the SEZ in the area of indirect effects. This area represents about 0.7% of the potentially suitable foraging habitat in the SEZ region (Table 11.3.12.1-1).

The overall impact on the loggerhead shrike from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised area of the Dry Lake SEZ is considered small because no potentially suitable habitat for this species occurs in the area of direct effects, and only indirect effects are possible. The implementation of programmatic design features may be sufficient to reduce indirect impacts on this species to negligible levels.

Long-Eared Owl. The long-eared owl was not analyzed for the Dry Lake SEZ in the Draft Solar PEIS. This species is an uncommon to common permanent resident in southern Nevada, and potentially suitable foraging habitat is expected to occur in the revised affected area of the Dry Lake SEZ. Approximately 5,580 acres (23 km^2) of potentially suitable foraging habitat on the revised area of the SEZ could be directly affected by construction and operations (Table 11.3.12.1-1). This direct impact area represents 0.1% of potentially suitable habitat in the SEZ region. About 82,700 acres (335 km^2) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 2.0% of the available suitable foraging habitat in the SEZ region (Table 11.3.12.1-1).

The overall impact on the long-eared owl from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised area of the Dry Lake SEZ is considered small because the amount of potentially suitable foraging habitat for this species in the area of direct effects represents less than 1% of potentially suitable foraging habitat in the SEZ region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of direct impacts on all potentially suitable foraging habitat is not a feasible way to mitigate impacts on the long-eared owl because potentially suitable shrubland is widespread throughout the area of direct effects and readily available in other portions of the affected area.

Lucy's Warbler. The Lucy's warbler was not analyzed for the Dry Lake SEZ in the Draft Solar PEIS. This species is an uncommon summer resident and breeder in desert riparian areas of southern Nevada. The Lucy's warbler is not known to occur in the revised area of the Dry Lake SEZ. However, approximately 43 acres (0.2 km^2) of potentially suitable foraging or nesting habitat in the revised area of the SEZ could be directly affected by construction and operations (Table 11.3.12.1-1). This direct impact area represents 0.1% of potentially suitable habitat in the SEZ region. About 2,500 acres (10 km^2) of potentially suitable foraging or nesting habitat occurs in the area of indirect effects; this area represents about 3.1% of the available suitable habitat in the SEZ region (Table 11.3.12.1-1).

Riparian habitats in the Moapa Valley that may provide suitable nesting and foraging habitat for the Lucy's warbler may be affected by spring discharges associated with the Garnet Valley regional groundwater basin. Solar energy development in the revised area of the Dry Lake SEZ may require water from the same regional groundwater basin that supports these riparian habitats. As discussed for groundwater-dependent species in the Draft Solar PEIS (Section 11.3.12.2.1), impacts on this species could range from small to large depending upon the solar energy technology deployed, the scale of development within the SEZ, and the cumulative rate of groundwater withdrawals (Table 11.3.12.1-1).

The implementation of programmatic design features and complete avoidance or limitation of groundwater withdrawals from the regional groundwater system would reduce impacts on the Lucy's warbler to small or negligible levels. Impacts can be better quantified for specific projects once water needs are identified. In addition, avoiding or minimizing disturbance to riparian areas on the SEZ would reduce direct impacts on this species. Impacts also could be reduced by conducting pre-disturbance surveys and avoiding or minimizing disturbance to occupied habitats (especially nests) in the area of direct effects. If avoidance or minimization is not feasible, a compensatory mitigation plan could be developed and implemented to mitigate direct effects on occupied habitats. Compensation could involve the protection and enhancement of existing occupied or suitable habitats to compensate for habitats lost to development. A comprehensive mitigation strategy that uses one or both of these options could be designed to completely offset the impacts of development.

Big Brown Bat. The big brown bat is a fairly common year-round resident in southern Nevada. This species was not analyzed for the Dry Lake SEZ in the Draft Solar PEIS. Suitable roosting habitats (caves, forests, and buildings) are not expected to occur in the revised area of the SEZ, but the availability of suitable roosting sites in the area of indirect effects has not been determined. Approximately 5,665 acres (25 km^2) of potentially suitable foraging habitat in the revised area of the SEZ could be directly affected by construction and operations (Table 11.3.12.1-1). This direct impact area represents about 0.2% of potentially suitable foraging habitat in the region. About 84,700 acres (343 km^2) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 2.3% of the available suitable foraging habitat in the region (Table 11.3.12.1-1). On the basis of an evaluation of SWReGAP land cover types, no suitable roosting habitat (forests and rock outcrops) exists within the SEZ or within the area of indirect effects.

The overall impact on the big brown bat from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised area of the Dry Lake SEZ is considered small, because the amount of potentially suitable habitat for this species in the area of direct effects represents less than 1% of potentially suitable habitat in the region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of all potentially suitable foraging habitat is not a feasible way to mitigate impacts because potentially suitable foraging habitat is widespread throughout the area of direct effects and is readily available in other portions of the SEZ region.

California Myotis. The California myotis is a fairly common year-round resident in southern Nevada. This species was not analyzed for the Dry Lake SEZ in the Draft Solar PEIS. Suitable roosting habitats (forests and rock outcrops) are not expected to occur in the revised area of the SEZ, but the availability of suitable roosting sites in the area of indirect effects has not been determined. Approximately 5,625 acres (23 km^2) of potentially suitable foraging habitat in the revised area of the SEZ could be directly affected by construction and operations (Table 11.3.12.1-1). This direct impact area represents about 0.2% of potentially suitable foraging habitat in the region. About 85,700 acres (347 km^2) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 2.4% of the available suitable foraging habitat in the region (Table 11.3.12.1-1). On the basis of an evaluation of SWReGAP land cover types, no suitable roosting habitat (forests and rock outcrops) exists within the SEZ or within the area of indirect effects.

The overall impact on the California myotis from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised area of the Dry Lake SEZ is considered small, because the amount of potentially suitable habitat for this species in the area of direct effects represents less than 1% of potentially suitable habitat in the region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of all potentially suitable foraging habitat is not a feasible way to mitigate impacts because potentially suitable foraging habitat is widespread throughout the area of direct effects and is readily available in other portions of the SEZ region.

Hoary Bat. The hoary bat is a fairly common year-round resident in southern Nevada. This species was not analyzed for the Dry Lake SEZ in the Draft Solar PEIS. Suitable roosting habitats (forests) are not expected to occur in the revised area of the SEZ, but the availability of suitable roosting sites in the area of indirect effects has not been determined. Approximately 5,665 acres (23 km^2) of potentially suitable foraging habitat in the revised area of the SEZ could be directly affected by construction and operations (Table 11.3.12.1-1). This direct impact area represents about 0.2% of potentially suitable foraging habitat in the region. About 83,700 acres (339 km^2) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 2.4% of the available suitable foraging habitat in the region (Table 11.3.12.1-1). On the basis of an evaluation of SWReGAP land cover types, no suitable roosting habitat (forests) exists within the revised area of the SEZ or within the area of indirect effects.

The overall impact on the hoary bat from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised area of the Dry Lake SEZ is considered small, because the amount of potentially suitable habitat for this species in the area of direct effects represents less than 1% of potentially suitable habitat in the region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of all potentially suitable foraging habitat is not a feasible way to mitigate impacts because potentially suitable foraging habitat is widespread throughout the area of direct effects and is readily available in other portions of the SEZ region.

Long-Legged Myotis. The long-legged myotis is a common to uncommon year-round resident in southern Nevada. This species was not analyzed for the Dry Lake SEZ in the Draft Solar PEIS. Suitable roosting habitats (forests and rock outcrops) are not expected to occur in the revised area of the SEZ, but the availability of suitable roosting sites in the area of indirect effects has not been determined. Approximately 5,580 acres (23 km^2) of potentially suitable foraging habitat in the revised area of the SEZ could be directly affected by construction and operations (Table 11.3.12.1-1). This direct impact area represents about 0.2% of potentially suitable foraging habitat in the region. About 83,200 acres (337 km^2) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 2.2% of the available suitable foraging habitat in the region (Table 11.3.12.1-1). On the basis of an evaluation of SWReGAP land cover types, no suitable roosting habitat (forests and rock outcrops) exists within the SEZ or within the area of indirect effects.

The overall impact on the long-legged myotis from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised area of the Dry Lake SEZ is considered small, because the amount of potentially suitable habitat for this species in the area of direct effects represents less than 1% of potentially suitable habitat in the region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of all potentially suitable foraging habitat is not a feasible way to mitigate impacts because potentially suitable foraging habitat is widespread throughout the area of direct effects and is readily available in other portions of the SEZ region.

Western Pipistrelle. The western pipistrelle is a common year-round resident in southern Nevada. This species was not analyzed for the Dry Lake SEZ in the Draft Solar PEIS. Suitable roosting habitats (forests and rock outcrops) are not expected to occur in the revised area of the SEZ, but the availability of suitable roosting sites in the area of indirect effects has not been determined. Approximately 5,710 acres (23 km^2) of potentially suitable foraging habitat in the revised area of the SEZ could be directly affected by construction and operations (Table 11.3.12.1-1). This direct impact area represents about 0.1% of potentially suitable foraging habitat in the region. About 93,000 acres (376 km^2) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 1.9% of the available suitable foraging habitat in the region (Table 11.3.12.1-1). On the basis of an evaluation of SWReGAP land cover types, no suitable roosting habitat (forests and rock outcrops) exists within the SEZ or within the area of indirect effects.

The overall impact on the western pipistrelle from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised area of the Dry Lake SEZ is considered small, because the amount of potentially suitable habitat for this species in the area of direct effects represents less than 1% of potentially suitable habitat in the region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of all potentially suitable foraging habitat is not a feasible way to mitigate impacts because potentially suitable foraging habitat is widespread throughout the area of direct effects and is readily available in other portions of the SEZ region.

11.3.12.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on special status and rare species are described in Section A.2.2 of Appendix A of this Final Solar PEIS. SEZ-specific resources and conditions will determine how programmatic design features are applied, for example:

- Pre-disturbance surveys should be conducted within the SEZ to determine the presence and abundance of special status species, including those identified in Table 11.3.12.1-1 of the Draft Solar PEIS, as well as those additional species presented in Table 11.3.12.1-1 of this update for the Final Solar PEIS. Disturbance to occupied habitats for these species shall be avoided or minimized to the extent practicable. If avoiding or minimizing impacts on occupied habitats is not possible, translocation of individuals from areas of direct effects, or compensatory mitigation of direct effects on occupied habitats may reduce impacts. A comprehensive mitigation strategy for special status species that uses one or more of these options to offset the impacts of development shall be developed in coordination with the appropriate federal and state agencies.

- Consultation with the USFWS and the NDOW shall be conducted to address the potential for impacts on the following four species currently listed as threatened or endangered under the ESA: Moapa dace, Pahrump poolfish, desert tortoise, and southwestern willow flycatcher. Consultation will identify an appropriate survey protocol, avoidance and minimization measures, and, if appropriate, reasonable and prudent alternatives, reasonable and prudent measures, and terms and conditions for incidental take statements.

- Coordination with the USFWS and NDOW shall be conducted for the following seven species that are candidates or under review for listing under the ESA that may be affected by solar energy development on the SEZ: Las Vegas buckwheat, grated tryonia, Moapa pebblesnail, Moapa Valley pebblesnail, Moapa Warm Spring riffle beetle, Moapa speckled dace, and Moapa White River springfish. Coordination would identify an appropriate survey protocol and mitigation requirements, which may include avoidance, minimization, translocation, or compensation.

- Avoiding or minimizing disturbance to desert wash habitat on the SEZ may reduce or eliminate impacts on the following 12 special status species: beaver dam breadroot, dune sunflower, halfring milkvetch, Las Vegas buckwheat, Littlefield milkvetch, Parish's phacelia, rosy two-tone beardtongue, sticky buckwheat, threecorner milkvetch, yellow two-tone beardtongue, Lucy's warbler, and phainopepla.

- Avoiding or minimizing disturbance to desert pavement habitat on the SEZ may reduce or eliminate impacts on the following six special status species:

dune sunflower, Las Vegas bearpoppy, mottled milkvetch, silverleaf sunray, sticky ringstem, threecorner milkvetch, and red-tail blazing star bee.

- Avoiding or minimizing disturbance to playa habitat on the SEZ to reduce or eliminate impacts on the following two special status species: Littlefield milkvetch and Parish's phacelia.

- Avoidance or minimization of groundwater withdrawals from the Garnet Valley basin may reduce or eliminate impacts on the following 14 groundwater-dependent special status species: grated tryonia, Moapa pebblesnail, Moapa Valley pebblesnail, Moapa Warm Springs riffle beetle, Spring Mountains springsnail, Warm Springs naucorid, Moapa dace, Moapa speckled dace, Moapa White River springfish, Pahrump poolfish, southwestern toad, Lucy's warbler, phainopepla, and southwestern willow flycatcher.

It is anticipated that implementation of these programmatic design features will reduce the majority of impacts on the special status species from habitat disturbance and groundwater use.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for special status species have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis. Projects will comply with terms and conditions set forth by the USFWS Biological Opinion resulting from the programmatic consultation and any necessary project-specific ESA Section 7 consultations.

11.3.13 Air Quality and Climate

11.3.13.1 Affected Environment

Except as noted below, the information for air quality and climate presented in the affected environment of the Draft Solar PEIS remains valid.

11.3.13.1.1 Existing Air Emissions

The Draft Solar PEIS presented Clark County emissions data for 2002. More recent data for 2008 (EPA 2011a) were reviewed. The two emissions inventories used different sources and assumptions; for example, the 2008 data did not include biogenic VOC emissions, and the Mohave coal-fired power plant, which was the dirtiest in the western United States, closed in 2005. In the more recent data, emissions of SO_2, NO_x, CO, and VOC were lower, while

emissions of PM_{10} and $PM_{2.5}$ were higher. These changes would not affect modeled air quality impacts presented in this update.

11.3.13.1.2 Air Quality

The calendar quarterly average NAAQS of 1.5 µg/m^3 for lead (Pb) presented in Table 11.3.13.1-2 of the Draft Solar PEIS has been replaced by the rolling 3-month standard (0.15 µg/m^3). The federal 24-hour and annual SO_2, 1-hour O_3, and annual PM_{10} standards have been revoked as well (EPA 2011b). These changes will not affect the modeled air quality impacts presented in this update. Nevada SAAQS have not been changed.

On September 27, 2010, Clark County was redesignated from a nonattainment to a maintenance area for CO. As noted in the Draft Solar PEIS, the proposed Dry Lake SEZ lies outside this area, and the conclusion in the Draft Solar PEIS that the proposed Dry Lake SEZ is in attainment for all criteria pollutants except 8-hour ozone remains valid.

The size of the proposed Dry Lake SEZ was reduced from 15,649 acres (63 km^2) to 5,717 acres (23 km^2). On the basis of this reduction, the distances to the nearest Class I areas are somewhat larger than was presented in the Draft Solar PEIS. However, only one Class I area (Grand Canyon NP) lies closer than the 62-mi (100-km) distance within which the EPA recommends that the permitting authorities notify the Federal Land Managers. Thus, the conclusion in the Draft Solar PEIS remains valid.

11.3.13.2 Impacts

11.3.13.2.1 Construction

Methods and Assumptions

Except for the area disturbed at any one time during construction, the methods and modeling assumptions have not changed substantially from those presented in the Draft Solar PEIS. On the basis of the reduced size of the SEZ, air quality impacts for this Final Solar PEIS were modeled by assuming that a maximum of 3,000 acres (12.14 km^2) would be disturbed for one project at any one time in the SEZ; the Draft Solar PEIS assumed disturbance of a maximum of 6,000 acres (24.28 km^2) at any one time.

Results

Potential particulate air impacts from construction were remodeled based on the updated boundaries of the proposed Dry Lake SEZ.[1] Changes in magnitude to predicted impacts at the boundary would be expected to be larger than changes at greater distances from the SEZ. Table 11.3.13.2-1 presents the updated maximum modeled concentrations from construction fugitive dust.

The updated maxima are lower than those in the Draft Solar PEIS, as would be expected given the reduction in the area assumed to be disturbed. Reductions were larger for the annual maximum increment (by about 42%) than for the 24-hour maximum increment (by about 5 to 12%). Totals, except for annual $PM_{2.5}$, could still exceed the NAAQS/SAAQS levels. These updated predictions are still consistent with the conclusion in the Draft Solar PEIS that maximum particulate levels in the vicinity of the SEZ could exceed the standard levels used for comparison. These high PM_{10} concentrations would be limited to the immediate areas surrounding the SEZ boundary and would decrease quickly with distance.

Other locations modeled in the Draft Solar PEIS include Moapa, Moapa Valley, Overton, and the nearest residences near North Las Vegas. The updated analysis conducted for this Final Solar PEIS predicted concentrations at all modeled locations lower than those presented in the Draft Solar PEIS. The conclusions presented in the Draft Solar PEIS remain valid with concentrations exceeding NAAQS/SAAQS values only at or near the SEZ boundary.

Updated 24-hour and annual PM_{10} concentration increments at the surrogate receptors[2] for the nearest Class I Area—Grand Canyon NP in Arizona—are lower than those presented in the Draft Solar PEIS; the updated 24-hour PM_{10} increment is reduced from a value exceeding the 24-hour Class I PSD increment in the Draft Solar PEIS to a value of about 89% of the increment. These surrogate receptors are more than 23 mi (37 km) from the Grand Canyon NP and the concentrations would be even lower in the Grand Canyon. The conclusion in the Draft Solar PEIS that the 24-hour PM_{10} Class I PSD increment could be somewhat exceeded in the Grand Canyon NP is updated for this Final Solar PEIS to conclude that all Class I PSD increments for PM would be met at the nearest Class I area.

[1] At this programmatic level, detailed information on construction activities, such as facility size, type of solar technology, heavy equipment fleet, activity level, work schedule, and so forth, is not known; thus air quality modeling cannot be conducted. Therefore, it has been assumed that an area of 3,000 acres (12.14 km^2) would be disturbed continuously, and the modeling results and discussion here should be interpreted in that context. During the site-specific project phase, more detailed information would be available and more realistic air quality modeling analysis could be conducted. It is likely that predicted impacts on ambient air quality for specific projects would be much lower than those presented in this Final Solar PEIS.

[2] Because the nearest Class I area is more than 31 mi (50 km) from the SEZ (which exceeds the maximum modeling distance), several regularly spaced receptors in the direction of the nearest Class I area were selected as surrogates for the PSD analysis.

TABLE 11.3.13.2-1 Maximum Air Quality Impacts from Emissions Associated with Construction Activities for the Proposed Dry Lake SEZ as Revised

Pollutant[a]	Averaging Time	Rank[b]	Concentration (μg/m^3) Maximum Increment[b]	Background[c]	Total	NAAQS/ SAAQS	Percentage of NAAQS/SAAQS Increment	Total
PM_{10}	24 hours	H6H	552	97.0	649	150	368	433
	Annual	–[d]	50.9	22.0	72.9	50	102	146
$PM_{2.5}$	24 hours	H8H	33.6	10.2	43.8	35	96	125
	Annual	–	5.1	4.1	9.1	15	34	61

[a] $PM_{2.5}$ = particulate matter with a diameter of ≤2.5 μm; PM_{10} = particulate matter with a diameter of ≤10 μm.

[b] Concentrations for attainment demonstration are presented: H6H = highest of the sixth-highest concentrations at each receptor over the 5-year period; H8H = highest of the multiyear average of the eighth-highest concentrations at each receptor over the 5-year period. For the annual average, multiyear averages of annual means over the 5-year period are presented. Maximum concentrations are predicted to occur at the site boundaries.

[c] See Table 11.3.13.1-2 of the Draft Solar PEIS.

[d] A dash indicates not applicable.

Except for the Class I PSD increments, the conclusions presented in the Draft Solar PEIS remain valid. Predicted 24-hour and annual PM_{10} and 24-hour $PM_{2.5}$ concentration levels could exceed the standard levels at the SEZ boundaries and in the immediate surrounding areas during the construction of solar facilities. To reduce potential impacts on ambient air quality and in compliance with programmatic design features, aggressive dust control measures would be used. Potential air quality impacts on nearby communities would be much lower. The annual $PM_{2.5}$ concentration level is predicted to be lower than its standard level. Modeling conducted for this Final Solar PEIS indicates that emissions from construction activities are not anticipated to cause particulate levels to exceed the Class I PSD increments at the nearest federal Class I area (Grand Canyon NP). Accordingly, it is anticipated that impacts of construction activities on ambient air quality would be moderate and temporary, as concluded in the Draft Solar PEIS.

With the reduced size of the SEZ, emissions from construction equipment and vehicles would be less than those estimated in the Draft Solar PEIS. Any potential impacts on AQRVs at nearby federal Class I areas would be less. Thus, as concluded in the Draft Solar PEIS, emissions from construction-related equipment and vehicles would be temporary and could cause some unavoidable but short-term impacts.

11.3.13.2.2 Operations

The reduction in the developable area of the proposed Dry Lake SEZ by about 63% decreases the generating capacity and annual power generation by a similar percentage and thus decreases the potentially avoided emissions presented in the Draft Solar PEIS. Total revised power generation capacity ranging from 508 to 915 MW is estimated for the Dry Lake SEZ for various solar technologies (see Section 11.3.1). As explained in the Draft Solar PEIS, the estimated amount of emissions avoided for the solar technologies evaluated depends only on the megawatts of conventional fossil fuel–generated power avoided.

Table 11.3.13.2-2 in the Draft Solar PEIS provided estimates for emissions potentially avoided by a solar facility. These estimates were updated by reducing emissions by about 63%, as shown in the revised Table 11.3.13.2.-2. For example, for the technologies estimated to require 9 acres/MW (power tower, dish engine, and PV), up to 1,077 tons of NO_x emissions per year (36.53% × the low-end value of 2,949 tons/year tabulated in the Draft Solar PEIS) could be avoided by full solar development of the revised area of the proposed Dry Lake SEZ. Although the total emissions avoided by full solar development of the proposed SEZ are considerably reduced from those presented in the Draft Solar PEIS, the conclusions of the Draft Solar PEIS remain valid; that is, if the proposed Dry Lake SEZ were fully developed, the emissions avoided could be substantial. Power generation from fossil fuel–fired power plants accounts for about 93% of the total electric power generated in Nevada, of which the contributions from natural gas and coal combustion are comparable. Thus, solar facilities built in the Dry Lake SEZ could avoid relatively more fossil fuel emissions than those built in other states that rely less on fossil fuel–generated power.

11.3.13.2.3 Decommissioning and Reclamation

The discussion in the Draft Solar PEIS remains valid. Decommissioning and reclamation activities would be of short duration, and their potential air impacts would be minor and temporary.

11.3.13.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce air quality impacts are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Limiting dust generation during construction and operations is a required programmatic design feature under BLM's Solar Energy Program. These extensive fugitive dust control measures would keep off-site PM levels as low as possible during construction.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for air quality have been identified for the proposed Dry Lake SEZ. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

TABLE 11.3.13.2-2 Annual Emissions from Combustion-Related Power Generation Avoided by Full Solar Development of the Proposed Dry Lake SEZ as Revised

Area Size (acres)[a]	Capacity (MW)[b]	Power Generation (GWh/yr)[c]	Emissions Avoided (tons/yr; 10^3 tons/yr for CO_2)[d]			
			SO_2	NO_x	Hg	CO_2
5,717	508–915	890–1,603	1,256–2,261	1,077–1,939	0.007–0.013	691–1,245
Percentage of total emissions from electric power systems in the state of Nevada[e]			2.4–4.2%	2.4–4.2%	2.4–4.2%	2.4–4.2%
Percentage of total emissions from all source categories in the state of Nevada[f]			1.9–3.4%	0.72–1.3%	–[g]	1.3–2.3%
Percentage of total emissions from electric power systems in the six-state study area[e]			0.50–0.90%	0.29–0.52%	0.24–0.44%	0.26–0.47%
Percentage of total emissions from all source categories in the six-state study area[f]			0.27–0.48%	0.04–0.07%	–	0.08–0.15%

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

[b] It is assumed that the SEZ would eventually have development on 80% of the lands and that a range of 5 acres (0.020 km^2) per MW (for parabolic trough technology) to 9 acres (0.036 km^2) per MW (power tower, dish engine, and PV technologies) would be required.

[c] Assumed a capacity factor of 20%.

[d] Composite combustion-related emission factors for SO_2, NO_x, Hg, and CO_2 of 2.82, 2.42, 1.6×10^{-5}, and 1,553 lb/MWh, respectively, were used for the state of Nevada.

[e] Emission data for all air pollutants are for 2005.

[f] Emission data for SO_2 and NO_x are for 2002, while those for CO_2 are for 2005.

[g] A dash indicates not estimated.

Sources: EPA (2009a,b); WRAP (2009).

11.3.14 Visual Resources

11.3.14.1 Affected Environment

The proposed Dry Lake SEZ as revised (see Figure 11.3.1.1-1) extends approximately 3.75 mi (6.0 km) north–south, is approximately 4.8 mi (7.7 km) wide and includes only the southernmost area of the originally proposed SEZ. In addition, 469 acres (1.9 km^2) of floodplain and wetland within the SEZ boundaries have been identified as non-development areas. Because of the reduction in size of the SEZ, the total acreage of the lands visible within the 25-mi (40-km) viewshed of the SEZ has decreased.

In addition, as a result of the boundary changes, the Dry Lake SEZ is now limited to the Mojave Playas Level IV ecoregion in the northeast portion of the SEZ and the Creosote Bush-Dominated Basins Level IV ecoregion in the remainder of the SEZ (Bryce et al. 2003).

The updated VRI map for the SEZ and surrounding lands is shown in Figure 11.3.14.1-1; it provides information collected in BLM's 2010 VRI, which was finalized in October 2011 (BLM 2011a). As shown, the updated VRI values for the SEZ are VRI Class III, indicating relatively moderate visual values, and VRI Class IV, indicating low visual values. The inventory indicates low scenic quality for the SEZ and its immediate surroundings due to the lack of topographic variability, water features, and diversity of color. Positive scenic quality attributes included adjacent scenery. The SEZ, however, is located in an area that contains a high sensitivity due to the adjacent Valley of the Fire State Park Offset and the I-15 transportation corridor.

Lands in the Southern Nevada District Office within the 25-mi (40-km), 650-ft (198-m) viewshed of the revised SEZ include 5,114 acres (20.7 km^2) of VRI Class I areas, 12,208 acres (49.4 km^2) of VRI Class II areas, 63,453 acres (256.8 km^2) of VRI Class III areas, and 32,216 acres (130.4 km^2) of VRI Class IV areas.

11.3.14.2 Impacts

The reduction in size of the SEZ would substantially diminish the total visual impacts associated with solar energy development in the SEZ. It would limit the total amount of solar facility infrastructure that would be visible and would lessen the geographic extent of the visible infrastructure.

The proposed Dry Lake SEZ, as revised in the Supplement to the Draft Solar PEIS, eliminated approximately 63% of the original SEZ. The resulting visual contrast reduction for any given point within view of the SEZ would vary greatly depending on the viewpoint's distance and direction from the SEZ. Contrast reduction generally would be greatest for viewpoints closest to the portions of the SEZ that were eliminated and especially for those that had broad, wide-angle views of these areas. In general, contrast reductions also would be larger for elevated viewpoints relative to non-elevated viewpoints, because the reduction in area of the solar facilities would be more apparent when looking down at the SEZ than when looking across it.

11.3.14.2.1 Impacts on the Proposed Dry Lake SEZ

Although the reduction in size of the SEZ discussed in Section 11.3.14.2 would substantially diminish visual contrasts associated with solar development, solar development still would involve major modification of the existing character of the landscape; it likely would dominate the views from most locations within the SEZ. Additional impacts would occur as a result of the construction, operation, and decommissioning of related facilities, such as access roads and electric transmission lines. In general, strong visual contrasts from solar development still would be expected to be observed from viewing locations within the SEZ.

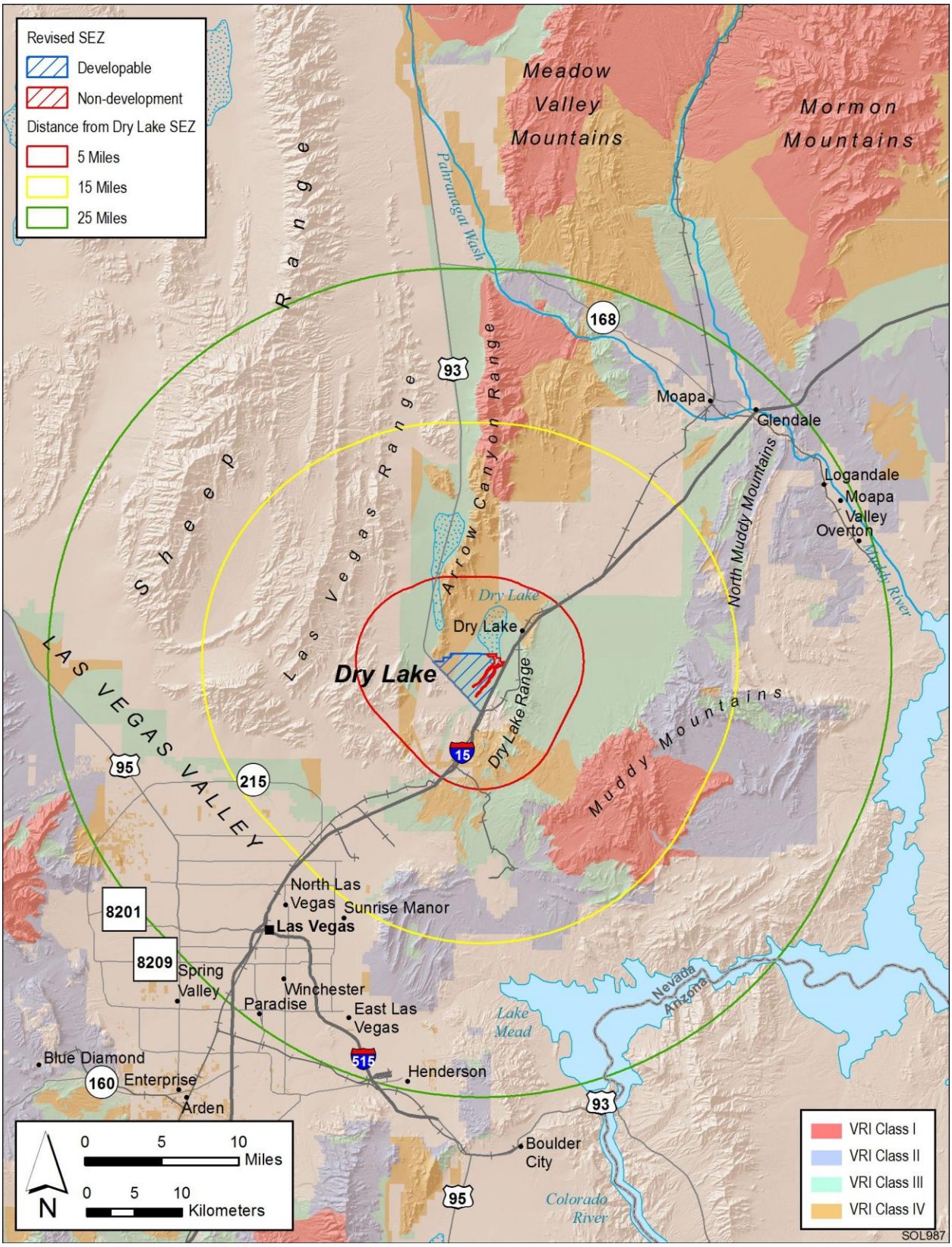

FIGURE 11.3.14.1-1 Visual Resource Inventory Values for the Proposed Dry Lake SEZ as Revised

11.3.14.2.2 Impacts on Lands Surrounding the Proposed Dry Lake SEZ

For the Draft Solar PEIS, preliminary viewshed analyses were conducted to identify which lands surrounding the proposed SEZ could have views of solar facilities in at least some portion of the SEZ (see Appendixes M and N of the Draft Solar PEIS for important information on assumptions and limitations of the methods used). Four viewshed analyses were conducted, assuming four different heights representative of project elements associated with potential solar energy technologies: PV and parabolic trough arrays, 24.6 ft (7.5 m); solar dishes and power blocks for CSP technologies, 38 ft (11.6 m); transmission towers and short solar power towers, 150 ft (45.7 m); and tall solar power towers, 650 ft (198.1 m).

These same viewsheds were recalculated in order to account for the boundary changes described in the Supplement to the Draft Solar PEIS. Figure 11.3.14.2-1 shows the combined results of the viewshed analyses for all four solar technologies. The colored segments indicate areas with clear lines of sight to one or more areas within the SEZ and from which solar facilities within these areas of the SEZ would be expected to be visible, assuming the absence of screening vegetation or structures and adequate lighting and other atmospheric conditions. The light brown areas are locations from which PV and parabolic trough arrays located in the SEZ could be visible. Solar dishes and power blocks for CSP technologies would be visible from the areas shaded in light brown and the additional areas shaded in light purple. Transmission towers and short solar power towers would be visible from the areas shaded light brown, light purple, and the additional areas shaded in dark purple. Power tower facilities located in the SEZ could be visible from areas shaded light brown, light purple, dark purple, and at least the upper portions of power tower receivers from the additional areas shaded in medium brown.

11.3.14.2.3 Impacts on Selected Federal-, State-, and BLM-Designated Sensitive Visual Resource Areas and Other Lands and Resources

Figure 11.3.14.2-2 shows the results of a GIS analysis that overlays selected federal-, state-, and BLM-designated sensitive visual resource areas onto the combined tall solar power tower (650 ft [198.1 m]) and PV and parabolic trough array (24.6 ft [7.5 m]) viewsheds to illustrate which of these sensitive visual resource areas would have views of solar facilities within the SEZ, and therefore potentially would be subject to visual impacts from those facilities. Distance zones that correspond with BLM's VRM system-specified foreground-middleground distance (5 mi [8 km]), background distance (15 mi [24 km]), and a 25-mi (40-km) distance zone are shown as well in order to indicate the effect of distance from the SEZ on impact levels, which are highly dependent on distance.

A similar analysis was conducted for the Draft Solar PEIS. The scenic resources included in the analysis were as follows:

- National Parks, National Monuments, National Recreation Areas, National Preserves, National Wildlife Refuges, National Reserves, National Conservation Areas, National Historic Sites;

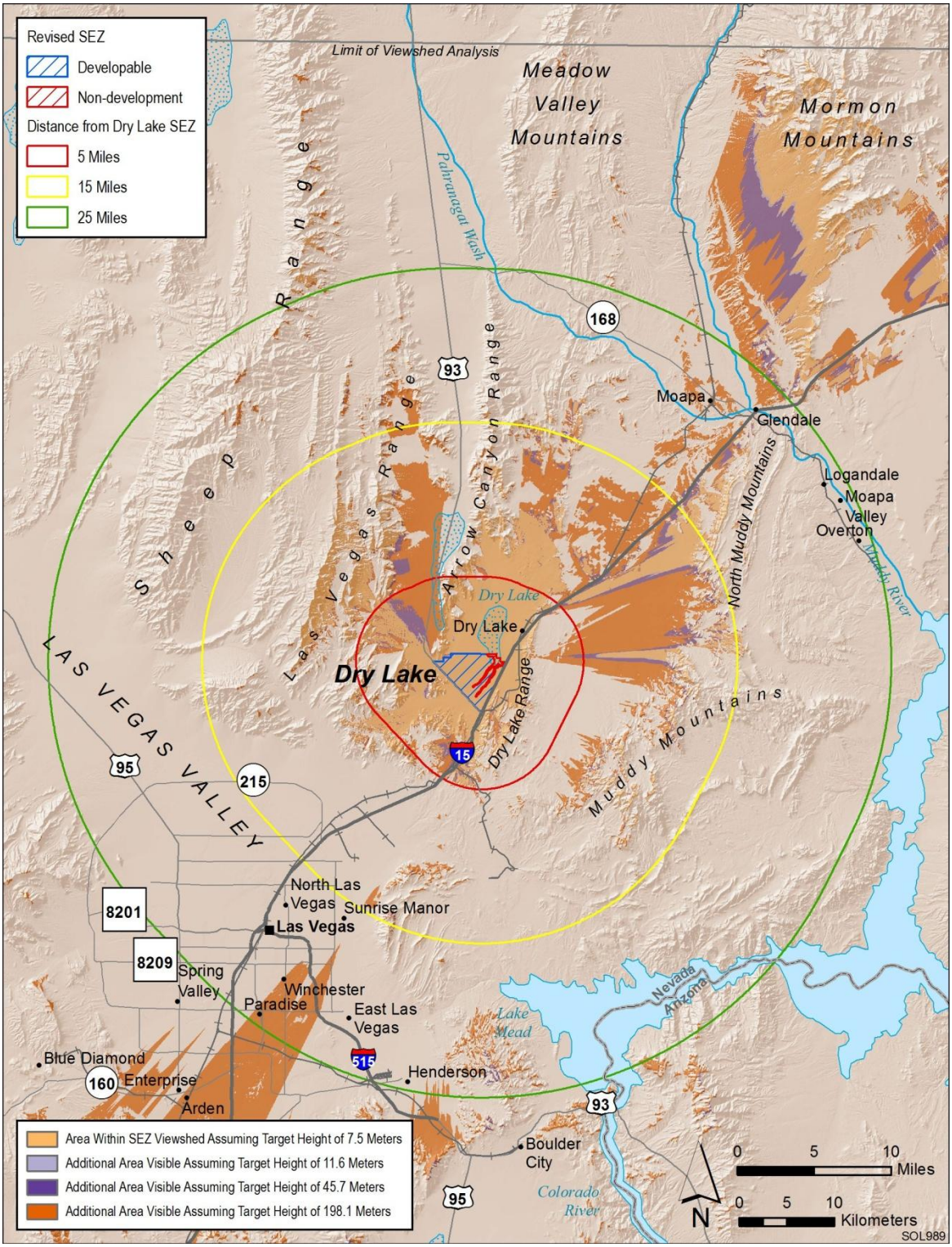

FIGURE 11.3.14.2-1 Viewshed Analyses for the Proposed Dry Lake SEZ as Revised and Surrounding Lands, Assuming Viewshed Heights of 24.6 ft (7.5 m), 38 ft (11.6 m), 150 ft (45.7 m), and 650 ft (198.1 m) (shaded areas indicate lands from which solar development and/or associated structures within the SEZ could be visible)

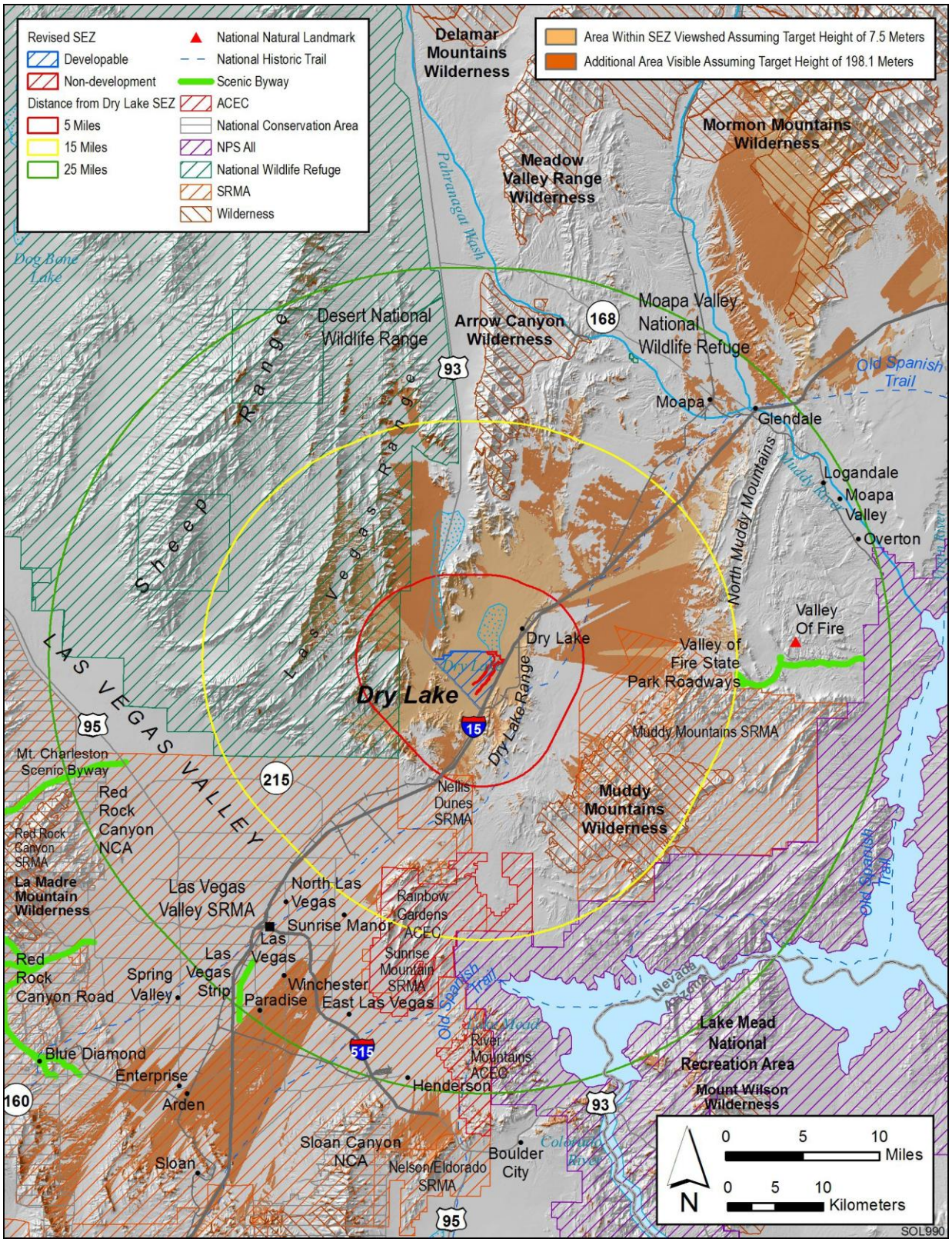

FIGURE 11.3.14.2-2 Overlay of Selected Sensitive Visual Resource Areas onto Combined 650-ft (198.1-m) and 24.6-ft (7.5-m) Viewsheds for the Proposed Dry Lake SEZ as Revised

- Congressionally authorized Wilderness Areas;
- Wilderness Study Areas;
- National Wild and Scenic Rivers;
- Congressionally authorized Wild and Scenic Study Rivers;
- National Scenic Trails and National Historic Trails;
- National Historic Landmarks and National Natural Landmarks;
- All-American Roads, National Scenic Byways, State Scenic Highways, and BLM- and USFS-designated scenic highways/byways;
- BLM-designated Special Recreation Management Areas; and
- ACECs designated because of outstanding scenic qualities.

The results of the GIS analyses are summarized in Table 11.3.14.2-1. The change in size of the SEZ alters the viewshed, such that the visibility of the SEZ and solar facilities within the SEZ from the surrounding lands would be reduced.

With the reduction in size of the SEZ, solar energy development within the SEZ would be expected to create minimal or weak visual contrasts for viewers within many of the surrounding scenic resource areas and other resources listed in Table 11.3.14.2-1. Exceptions include the Desert NWR, the Old Spanish National Historic Trail, Arrow Canyon WA, Muddy Mountains WA, and the Nellis Dunes SRMA. In these areas, moderate or strong visual contrasts still could occur.

In addition to these areas, impacts on other lands and resource areas also were evaluated. These areas include I-15, U.S. 93, and the communities of Glendale, Moapa, Paradise, and Winchester.

11.3.14.2.4 Summary of Visual Resource Impacts

The visual contrast analysis in the Draft Solar PEIS determined that because there could be multiple solar facilities within the Dry Lake SEZ, a variety of technologies employed, and a range of supporting facilities required, solar development within the SEZ would make it essentially industrial in appearance and would contrast strongly with the surrounding, mostly natural-appearing landscape.

The reduction in size of the SEZ substantially diminishes the visual contrast associated with solar facilities as seen both within the SEZ and from surrounding lands in both daytime and

TABLE 11.3.14.2-1 Selected Potentially Affected Sensitive Visual Resources within a 25-mi (40-km) Viewshed of the Proposed Dry Lake SEZ as Revised, Assuming a Target Height of 650 ft (198.1 m)

Feature Type	Feature Name (Total Acreage/Linear Distance)[a,b,c]	Feature Area or Linear Distance[d]		
		Visible within 5 mi	Visible Between 5 and 15 mi	Visible Between 15 and 25 mi
National Recreation Area	Lake Mead National Recreation Area (1,105,951 acres)	0 acres (0%)	0 acres (0%)	1,615 acres (0%)
National Wildlife Refuge	Desert National (1,626,903 acres)	6,272 acres (0%)	22,203 acres (1%)	4,183 acres (0%)
National Historic Trail	Old Spanish[e] (2,700 mi)	4.2 mi (0%)	7.2 mi (0%)	2.1 mi (0%)
Wilderness Areas (WAs)	Arrow Canyon (27,521 acres)	0 acres (0%)	1,011 acres (4%)	204 acres (1%)
	Muddy Mountains (44,522 acres)	0 acres (0%)	3,891 acres (9%)	0 acres (0%)
ACECs	Rainbow Gardens (38,771 acres)	0 acres (0%)	644 acres (2%)	168 acres (0%)
	River Mountains (11,029 acres)	0 acres (0%)	0 acres (0%)	1,935 acres (18%)
Scenic Byways	Bitter Springs Backcountry (28 mi)[f]	0 mi (0%)	7.7 mi (28%)	0 mi (0%)
SRMAs	Las Vegas Valley (447,244 acres)	0 acres (0%)	1,238 acres (0%)	12,433 acres (3%)
	Muddy Mountains (128,493 acres)	0 acres (0%)	13,561 acres (11%)	0 acres (0%)
	Nellis Dunes (8,924 acres)	380 acres (4%)	61 acres (1%)	0 acres (0%)
	Sunrise Mountain (33,322 acres)	0 acres (0%)	687 acres (2%)	168 acres (1%)

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

[b] To convert mi to km, multiply by 1.609.

[c] Meadow Valley Range WA, Mormon Mountains WA, and the Las Vegas Strip Scenic Byway are not included in this table. These areas were in the viewshed of the original proposed SEZ and were included in the corresponding table in the Draft Solar PEIS; however, these areas are not within the viewshed of the proposed SEZ, as revised.

[d] Percentage of total feature acreage or road length viewable.

[e] Mileage of Old Spanish National Historic Trail (BLM 2011b).

[f] Mileage of Bitter Springs Backcountry Byway (America's Byways 2012).

nighttime views. The reductions in visual contrast resulting from the boundary changes can be summarized as follows:

- Within the Dry Lake SEZ: Contrasts experienced by viewers in the north and eastern portion of the SEZ would be reduced due to the elimination of 9,463 acres (38.3 km^2) of land within the SEZ; however, strong contrasts still would result in the remaining developable area. There would be a small reduction in contrasts in the northwest portion of the SEZ near I-15 due to the designation of non-development lands in the SEZ.

- Lake Mead NRA: A reduction in contrasts would be anticipated due to the slight reduction of the SEZ in the eastern portion; however, solar development within the SEZ still would cause minimal contrast levels.

- Desert NWR: A reduction in contrasts would be anticipated due to the removal of lands in the northern part of the SEZ; however, solar development would still cause weak to strong contrasts, largely in part due to the proximity of the NWR to the SEZ. The NWR is located less than 3 mi (5 km) from the edge of the remaining portion of the SEZ. Strong levels of visual contrast would be expected for some high-elevation viewpoints in the NWR, with weak or moderate levels of visual contrast expected for most lower-elevation viewpoints in the NWR.

- Old Spanish National Historic Trail: A reduction in contrasts would be anticipated due to the removal of lands within the eastern portion of the SEZ (i.e., that area to the east of I-15). However, because of the proximity of the Trail to the SEZ, solar development within the SEZ still would cause minimal to strong contrasts.

- Arrow Canyon WA: A reduction in contrasts would be anticipated due to the elimination of the northern part of the SEZ; expected contrast levels would be lowered from "weak to strong" to "weak to moderate."

- Meadow Valley Range WA: Meadow Valley Range WA is no longer located within the 25-mi (40-km) viewshed; expected contrast levels would be lowered from "minimal" to "none."

- Mormon Mountains WA: Mormon Mountains WA is no longer located within the 25-mi (40-km) viewshed; expected contrast levels would be lowered from "minimal" to "none."

- Muddy Mountains WA: A reduction in contrasts would be anticipated due to the elimination of land to the east of I-15; however, solar development within the SEZ still would cause weak to moderate contrasts.

- Rainbow Gardens ACEC: A reduction in contrasts would be anticipated; solar development within the SEZ still would cause minimal contrasts.

- River Mountains ACEC: A reduction in contrasts would be anticipated; solar development within the SEZ still would cause minimal contrasts.

- Bitter Springs Backcountry Scenic Byway: A reduction in contrasts would be anticipated due to the elimination of acreage in the northern and eastern portions of the SEZ; however, solar development within the SEZ still would cause weak contrasts.

- Las Vegas Strip Scenic Byway: No visual impacts would be expected.

- Las Vegas Valley SRMA: A reduction in contrasts would be anticipated; however, solar development within the SEZ still would cause weak contrasts.

- Muddy Mountains SRMA: A reduction in contrasts would be anticipated due to the elimination of acreage east of I-15 and in the northern portion of the SEZ; expected contrast levels would be lowered from "weak to moderate" to "weak."

- Nellis Dunes SRMA: A reduction in contrasts would be anticipated; solar development within the SEZ still would cause weak to moderate contrasts.

- Sunrise Mountains SRMA: A reduction in contrasts would be anticipated; however, solar development within the SEZ still would cause minimal contrasts.

- I-15: A reduction in contrasts would be anticipated as the roadway no longer runs through the SEZ; instead, it serves as the eastern boundary of the SEZ, thereby eliminating views of the solar development to the east of the roadway. However, because of the proximity of the roadway to the SEZ, solar development within the SEZ still would cause minimal to strong contrasts. Stronger impacts would be experienced by viewers in areas closer to the SEZ.

- U.S. 93: A reduction in contrasts would be anticipated because of the elimination of the northern portion of the SEZ. However, U.S. 93 still serves as the western-southwestern boundary of the SEZ; in these areas, expected contrasts would be quite strong with contrast lessening as one would travel farther from the SEZ. As a result, however, solar development within the SEZ still would cause minimal to strong contrasts.

- Glendale: The community of Glendale is no longer located within the 25-mi (40-km) viewshed; expected contrast levels would be lowered from "minimal" to "none."

- Moapa: A reduction in contrasts would be anticipated because of the removal of the northern portion of the SEZ; however, solar development within the SEZ still would cause minimal contrasts.

- Paradise: No visual impacts would be expected.

- Winchester: No visual impacts would be expected.

11.3.14.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on visual resources are described in Section A.2.2 of Appendix A of this Final Solar PEIS. While application of the programmatic design features would reduce potential visual impacts somewhat, the degree of effectiveness of these design features can only be assessed at the site- and project-specific level. Given the large scale, reflective surfaces, and strong regular geometry of utility-scale solar energy facilities and the lack of screening vegetation and landforms within the SEZ viewshed, siting the facilities away from sensitive visual resource areas and other sensitive viewing areas would be the primary means of mitigating visual impacts. The effectiveness of other visual impact mitigation measures generally would be limited.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for visual resources have been identified in this Final Solar PEIS. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

11.3.15 Acoustic Environment

11.3.15.1 Affected Environment

The developable area of the proposed Dry Lake SEZ was reduced from 15,649 acres (63 km^2) to 5,717 acres (23 km^2); the northern and central portions and the eastern edge of the SEZ proposed in the Draft Solar PEIS were removed. With the change in the proposed boundaries, distances to some of the noise receptors are greater than those presented in the Draft Solar PEIS. Distances to the nearest residences near Nellis Air Force Base remain the same as in the Draft Solar PEIS, but other communities such as Moapa, Moapa Valley, and Overton are now several miles farther from the SEZ.

11.3.15.2 Impacts

11.3.15.2.1 Construction

The noise impact analysis in the Draft Solar PEIS assumed that a maximum of two projects (6,000 acres [24.3 km^2]) would be developed at any one time within the SEZ. With the reduction in size of the proposed SEZ, the noise impact analysis for this Final Solar PEIS assumes that only one project (3,000 acres [12.1 km^2]) would be under development at a given time. Thus the updated noise predictions in this Final Solar PEIS will be less than those in the Draft Solar PEIS, and except as noted below for wildlife impact in specially designated areas, the conclusions presented in the Draft Solar PEIS remain valid.

The distance from the updated SEZ boundary to the Coyote Springs ACEC did not change (as close as 0.25 mi [0.4 km]), and the predicted construction noise level of 58 dBA at the ACEC boundary still exceeds the typical daytime mean rural background level of 40 dBA. On the basis of comments received and recent references, as applicable, this Final Solar PEIS used an updated approximate significance threshold of 55 dBA, corresponding to the onset of adverse physiological impacts (Barber et al. 2010) to update the analysis of potential noise impacts on terrestrial wildlife in areas of special concern. As discussed in Section 5.10.2 of the Draft and Final Solar PEIS, there is also the potential for other effects (e.g., startle or masking) to occur at lower noise levels (Barber et al. 2011). Considering the approximate significance threshold of 55 dBA and the potential for impacts at lower noise levels, impacts on terrestrial wildlife from construction noise would have to be considered on a site-specific basis, including consideration of site-specific background levels and hearing sensitivity for site-specific terrestrial wildlife of concern.

With the change in SEZ boundaries, the distance to the Old Spanish National Historic Trail has increased to about 2.1 mi (3.4 km), in comparison to the 1.3 mi (2.1 km) presented in the Draft Solar PEIS. Construction noise levels from the SEZ are estimated to be about 34 dBA at the nearest point from the SEZ to the Trail. This level is below the typical daytime mean rural background level of 40 dBA. Noise levels at the Trail are most affected by I-15, which abuts the southeastern SEZ boundary.

Construction noise and vibration impacts on the revised Dry Lake SEZ and SEZ-specific design features would be the same or less than those presented in the Draft Solar PEIS. Construction would cause negligible but unavoidable, localized, short-term noise impacts on neighboring communities.

11.3.15.2.2 Operations

With the decrease in size of the proposed SEZ, the updated noise impacts estimated in this Final Solar PEIS are less than those presented in the Draft Solar PEIS, and except as noted below for wildlife impacts in specially designated areas, the conclusions presented in the Draft Solar PEIS remain valid.

Parabolic Trough and Power Tower

Operating parabolic trough or power tower facilities with TES could result in minimal adverse noise impacts on the nearest residences, depending on background noise levels and meteorological conditions. However, noise from such facilities could have some adverse impacts on activities on the Coyote Springs ACEC and the Old Spanish National Historic Trail.

As stated above under construction impacts, for this Final Solar PEIS an updated approximate significance threshold of 55 dBA was used to evaluate potential noise impacts on terrestrial wildlife in areas of special concern. Because there is no change in distance to the Coyote Springs ACEC, estimated noise levels for either a parabolic trough or power tower facility are the same (daytime and nighttime levels of 48 and 58 dBA, respectively). Thus, for these types of facilities, nighttime operations could adversely affect wildlife in the ACEC. Considering these potential impacts and the potential for impacts at lower noise levels, impacts on terrestrial wildlife from operation noise from parabolic trough or power tower facilities operating at nighttime would have to be considered on a project-specific basis, including consideration of site-specific background levels and hearing sensitivity for site-specific terrestrial wildlife of concern.

For either a parabolic trough or power tower facility near the southern SEZ boundary, daytime and nighttime noise levels at the Old Spanish National Historic Trail are estimated to be 35 and 45 dBA, respectively. Operations noise from a solar facility with TES would not be anticipated to affect any daytime activities at the Old Spanish National Historic Trail, but could have some adverse impacts on nighttime activities there. However, a considerable portion of the operation noise might be masked by nearby road traffic on I-15, railroad traffic, and industrial activities along I-15.

Dish Engines

The reduction in size of the proposed Dry Lake SEZ by about 63% would reduce the number of dish engines by a similar percentage. Noise from a dish engine facility is not anticipated to cause adverse impacts on the nearest residences. However, noise from either type of facility could have some adverse impacts on activities on the Coyote Springs ACEC and the Old Spanish National Historic Trail.

For a dish engine facility, the estimated noise level at the Coyote Springs ACEC is about 52 dBA, 2 dBA lower than the value presented in the Draft Solar PEIS due to reduced area and capacity. This level indicates that adverse effects on wildlife in the ACEC from dish engine facility operations are unlikely. However, considering the potential for impacts at lower noise levels, impacts on terrestrial wildlife from dish engine facility noise would have to be considered on a project-specific basis, including consideration of site-specific background levels and hearing sensitivity for site-specific terrestrial wildlife of concern.

For a dish engine facility which would operate only during daytime hours, the estimated noise level at the Old Spanish National Historic Trail is about 44 dBA. Operations noise from a

dish engine facility could have some adverse impacts. However, a considerable portion of the operation noise might be masked by nearby road traffic on I-15, railroad traffic, and industrial activities along I-15.

Changes in the proposed SEZ boundaries would not affect the discussions of vibration, transformer and switchyard noise, and transmission line corona discharge presented in the Draft Solar PEIS. Noise impacts from these sources would be negligible.

11.3.15.2.3 Decommissioning and Reclamation

The discussion in the Draft Solar PEIS remains valid. Decommissioning and reclamation activities would be of short duration, and their potential impacts would be minor and temporary. Vibration impacts would be lower than those during construction and thus negligible.

11.3.15.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce noise impacts are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will provide some protection from noise impacts.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for noise impacts in the proposed Dry Lake SEZ have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

11.3.16 Paleontological Resources

11.3.16.1 Affected Environment

Data provided in the Draft Solar PEIS remain valid, with the following updates:

- The change in developable area for the proposed Dry Lake SEZ has eliminated the playa deposits and significantly reduced the residual deposits located on the western edge of the SEZ. The SEZ, as currently configured, consists primarily of alluvial deposits.

- The BLM Regional Paleontologist may have additional information regarding the paleontological potential of the SEZ and be able to verify the PFYC of the SEZ as Class 2 and 3b as used in the Draft Solar PEIS.

11.3.16.2 Impacts

The assessment provided in the Draft Solar PEIS remains valid. Few, if any, impacts on significant paleontological resources are likely to occur in 90% of the proposed Dry Lake SEZ. However, a more detailed look at the geological deposits of the SEZ is needed to determine whether a paleontological survey is warranted.

11.3.16.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on paleontological resources are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Impacts would be minimized through the implementation of required programmatic design features, including a stop-work stipulation in the event that paleontological resources are encountered during construction, as described in Section A.2.2 of Appendix A.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for paleontological resources have been identified. If the geological deposits are determined to be as described in the Draft Solar PEIS and are classified as PFYC Class 2, mitigation of paleontological resources within most of the Dry Lake SEZ is not likely to be necessary. The need for and nature of any SEZ-specific design features for the remaining portion of the SEZ would depend on the results of future paleontological investigations. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

As additional information on paleontological resources (e.g., from regional paleontologists or from new surveys) becomes available, the BLM will post the data to the project Web site (http://solareis.anl.gov) for use by applicants, the BLM, and other stakeholders.

11.3.17 Cultural Resources

11.3.17.1 Affected Environment

Data provided in the Draft Solar PEIS remain valid, with the following updates:

- The distance from the SEZ boundary to the Moapa River Indian Reservation and the Moapa River has increased by about 4 mi (6 km).

- The amount of land subject to archaeological survey in the SEZ has decreased from 60.2%, 9,446 acres (38 km^2), to 47.9%, 2,743 acres (11 km^2).

- The number of previously recorded cultural resource sites in the SEZ has decreased from 22 to 6. One site is a remnant of the congressionally

designated Old Spanish National Historic Trail and is eligible for listing in the NRHP. The eligibility of the other five sites is unknown at this time.

- A tribally approved ethnographic study of the proposed Dry Lake SEZ was conducted (SWCA and University of Arizona 2011), and a summary of that study was presented in the Supplement to the Draft Solar PEIS. A possible site and a number of new cultural landscapes, important water sources, and traditional plants and animals were identified (see Section 11.3.18 for a description of the latter). The completed ethnographic study is available in its entirety on the Solar PEIS Web site (http://solareis.anl.gov).

- The Arrow Canyon Range is directly connected to the Cry Ceremony and the Salt Song Trail, as well as various other songs, stories, and ceremonies of the Southern Paiute Tribe.

- The Moapa River/Muddy River is a source of healing for the Southern Paiute Tribe.

- The Salt Song Trail does pass through the SEZ.

- The members of the Southern Paiute Tribe have farmed and managed mesquite groves in and around the Dry Lake SEZ, and members identified these groves as important cultural features. The Southern Paiute are historically known for their use of irrigated agriculture and the relocation of seeds to new environments, specifically seeds of mesquite trees.

- Additional information may be available to characterize the area surrounding the proposed SEZ in the future (after the Final Solar PEIS is completed), as follows:
  - Results of 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.
  - Verification that the surveys that have been conducted in the SEZ meet current survey standards. If these surveys do meet current survey standards, no Class II surveys would be recommended.
  - Identification of 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.
  - Continuation of government-to-government consultation as described in Section 2.4.3 of the Supplement to the Draft Solar PEIS and IM 2012-032 (BLM 2011c), 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.

11.3.17.2 Impacts

As stated in the Draft Solar PEIS, direct impacts on significant cultural resources could occur in the proposed Dry Lake SEZ; however, further investigation is needed. Impacts could occur on the known sites in the SEZ, and the Old Spanish National Historic Trail could be affected visually depending on the location of high-potential segments of the Trail. The following updates are based on the revised boundaries of the SEZ:

- Sixteen fewer sites are potentially affected within the reduced footprint of the SEZ.

- Impacts on tribally significant mesquite groves are possible.

11.3.17.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce cultural impacts are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Programmatic design features will be applied to address SEZ-specific resources and conditions, for example:

- For projects in the Dry Lake SEZ that are located within the viewshed of the Old Spanish National Historic Trail, a National Trail inventory will be required to determine the area of possible adverse impact on resources, qualities, values, and associated settings of the Trail; to prevent substantial interference; and to determine any areas unsuitable for development. Residual impacts will be avoided, minimized, and/or mitigated to the extent practicable according to program policy standards. Programmatic design features have been included in BLM's Solar Energy Program to address impacts on National Historic Trails (see Section A.2.2.23 of Appendix A).

Programmatic design features also assume that the necessary surveys, evaluations, and consultations will occur.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, the following SEZ-specific design feature for cultural resources has been identified:

- Coordination with the Trail Administration for the Old Spanish Trail and Old Spanish Trail Association is recommended for identifying potential mitigation strategies for avoiding or minimizing potential impacts on the congressionally designated Old Spanish National Historic Trail, and also on any remnants of the NRHP-listed sites associated with the Old Spanish Trail/Mormon Road

that may be located within or near the SEZ. Avoidance of the Old Spanish Trail NRHP-listed site within the southeastern portion of the proposed SEZ is recommended.

Additional SEZ-specific design features would be determined in consultation with the Nevada SHPO and affected tribes and would depend on the results of future investigations. Information in the ethnographic reports would suggest that impacts on the Arrow Canyon Range, the Moapa/Muddy River, the Salt Song Trail, and culturally sensitive plant and animal species would need to be avoided, minimized, or otherwise mitigated if solar energy development were to be initiated in the proposed Dry Lake SEZ. Some SEZ-specific design features may be established through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

11.3.18 Native American Concerns

11.3.18.1 Affected Environment

Data presented in the Draft Solar PEIS remain valid, with the following updates:

- A tribally approved ethnographic study of the proposed Dry Lake SEZ was conducted (SWCA and University of Arizona 2011), and a summary of that study was presented in the Supplement to the Draft Solar PEIS. A possible site and a number of new cultural landscapes, important water sources, and traditional plants and animals were identified. The completed ethnographic study is available in its entirety on the Solar PEIS Web site (http://solareis.anl.gov).

- The tribal representatives from the Moapa Band of Paiute Indians believe that all the cultural resources and landscapes within the proposed Dry Lake SEZ are important in helping the Southern Paiute understand their past, present, and future.

- The tribal representatives of the Moapa Band of Paiute Indians believe that the proposed Dry Lake SEZ area should be managed as a spiritual cultural landscape and that areas significant to the Southern Paiute (e.g., Arrow Canyon Range and Potato Woman) should be nominated as traditional cultural properties. The Moapa Band of Paiute Indians would like to work with the BLM in restricting access to the proposed Dry Lake SEZ, as well as the surrounding area, from OHVs and eliminating the use of this area as a shooting range. In addition, the Southern Paiute would like to co-manage the mesquite groves and other traditionally important plant resources within the area, with the BLM (SWCA and University of Arizona 2011).

- The Southern Paiute have identified the Arrow Canyon Range as associated with songs, stories, and ceremonies of the Southern Paiute people as well as home to the Nah'gah, a small variety of mountain sheep that live exclusively within the range. The Nah'gah are created by the Southern Paiute Creator Being and the geological feature Potato Woman, located northeast of the Arrow Canyon Range. Potato Woman has a permanent responsibility to create the Nah'gah, which bring songs, stories, and medicine to the Southern Paiute people and serve as spirit helpers to shaman.

- The Southern Paiute have a spiritual connection to water. They believe that *Puha* (power) follows the flow of water, connecting landscapes and elements associated with those landscapes. The Apex Pleistocene Lake, the Muddy River, the Colorado River, the Virgin River, Hogan Springs, and Warm Springs are identified as important sources of water for the Southern Paiute.

- The Old Spanish Trail holds significance in Southern Paiute history as European movement along this Trail resulted in polluted water, the destruction of many Southern Paiute agricultural areas, and the spread of disease among Native groups in the area. Additional European exploration along this route led to the establishment of the Mormon Road, which led to further decimation of Native American groups and the eventual removal of the Southern Paiute to the Moapa River Indian Reservation.

- Arrow Canyon holds special significance to Southern Paiute peoples because it is home to Tabletop Mountain, where Native Americans from the surrounding area gathered to participate in the Ghost Dance in 1890.

- Mount Charleston, located approximately south–southwest of the SEZ, and Coyote's Jaw, located north of the SEZ in the Pahranagat Range, have been identified as creation places for the Southern Paiute.

- The members of the Southern Paiute Tribe have farmed and managed mesquite groves in and around the Dry Lake SEZ, and members identified these groves as important cultural features. The Southern Paiute are historically known for their use of irrigated agriculture and the relocation of seeds to new environments, specifically seeds of mesquite trees.

- In addition to those listed in Table 11.3.18.1-2 of the Draft Solar PEIS, the following traditional plants have been identified: California barrel cactus (*Ferocactus cylindraceus*), desert globemallow (*Sphaeralcea ambigua*), hedgehog cactus (*Enchinocereus engelmenii*), spiny chorizanthe (*Chorizanthe rigida*), and Western wheatgrass (*Pascopyrum smithii*).

- In addition to those listed in Table 11.3.18.1-3 of the Draft Solar PEIS, the following traditional animals have been identified: coyote (*Canus latrans*), gray fox (*Urocyon cinereoargenteus*), mountain sheep (*Ovis* spp.), white-

tailed antelope squirrel (*Spermphilus variegates*), woodrat (*Neotoma* sp.), common raven (*Corvus corax*), American kestrel (*Falco sparverius*), cactus wren (*Campylorhynchus brunneicapillus*), Gambel's quail (*Callipepla gambelii*), great horned owl (*Bubo virginianus*), horned lark (*Eremophilia alpestris*), killdeer (*Charadrius vociferous*), lesser nighthawk (*Chordeiles acutipennis*), loggerhead strike (*Lanius ludovicianus*), rock wren (*Salpinctes obsoletus*), Say's phoebe (*Sayornis saya*), northern mockingbird (*Mimus polyglottos*), red-tailed hawk (*Buteo jamaicensis*), turkey vulture (*Cathartes aura*), Western kingbird (*Tyrannus verticalis*), and rattlesnake (*Crotalus* sp.).

11.3.18.2 Impacts

The description of potential concerns provided in the Draft Solar PEIS remains valid. During past project-related consultation, the Southern Paiute have expressed concerns about project impacts on a variety of resources, including important food plants, medicinal plants, plants used in basketry, plants used in construction, large game animals, small game animals, birds, and sources of clay, salt, and pigments. While no comments specific to the proposed Dry Lake SEZ have been received from Native American tribes to date, the Paiute Indian Tribe of Utah has asked to be kept informed of Solar PEIS developments.

In addition to the impacts discussed in the Draft Solar PEIS, the ethnographic study conducted for the proposed Dry Lake SEZ identified the following impacts:

- Tribal representatives believe that solar energy development within the Dry Lake SEZ will adversely affect water sources such as the Apex Pleistocene Lake, Muddy River, Colorado River, and Virgin River; geological features such as the Arrow Canyon Range and Potato Woman; important places such as the Salt Song Trail and their mesquite groves; historical sites such as the Old Spanish Trail/Mormon Road, the railroad, Tabletop Mountain in Arrow Canyon, and the Moapa River Reservation; and traditional plant and animal resources (SWCA and University of Arizona 2011).

- OHV access to the area, use of the area as a shooting range, exhaust from the freeway, freeway traffic, the SNWA, and energy from the electrical lines have been identified by tribal representatives of the Moapa Band of Paiute Indians as currently having impacts on cultural resources, cultural landscapes, traditionally important plants and animals, and water sources (SWCA and University of Arizona 2011).

- Development within the proposed Dry Lake SEZ could result in visual impacts on the Arrow Canyon Range and Arrow Canyon. Any impacts on the Arrow Canyon Range directly affect Potato Woman and the Nah'gah because they are all connected.

- Development within the proposed Dry Lake SEZ could affect the Nah'gah's natural habitat and therefore the spiritual nature of the Arrow Canyon Range, Potato Woman, and the stories and medicine of the Southern Paiute.

- Development within the proposed Dry Lake SEZ may affect the spiritual connection that the Southern Paiute have to water, as well as the quantity of water naturally stored in underground aquifers. The Southern Paiute are concerned that energy development within the area will greatly reduce the amount of water that is available to the Tribe and to plants and animals in the valley.

- Development of a project area within the SEZ will directly affect culturally important plant and animal resources because it will likely require the grading of the project area and the possible removal of the mesquite grove.

11.3.18.3 SEZ-Specific Design Features and Design Feature Effectiveness

Tribal representatives believe that solar energy development within the proposed Dry Lake SEZ will adversely affect identified and unidentified archaeological resources; water sources; culturally important geological features; and traditional plant, mineral, and animal resources (SWCA and University of Arizona 2011). Required programmatic design features that would reduce impacts on Native American concerns are described in Section A.2.2 of Appendix A of this Final Solar PEIS. For example, impacts would be minimized through the avoidance of sacred sites, water sources, and tribally important plant and animal species. Programmatic design features require that the necessary surveys, evaluations, and consultations would occur. The affected tribes would be notified regarding the results of archaeological surveys, and they would be contacted immediately upon the discovery of Native American human remains and associated cultural items.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, the following proposed SEZ-specific design features to address Native American concerns have been identified:

- The Moapa Band of Paiute Indians have specifically requested formal government-to-government contact when construction or land management projects are being proposed on and/or near the Muddy River, the Virgin River, the Colorado River, the Arrow Canyon Range, Potato Woman, and the Apex Pleistocene Lake (SWCA and University of Arizona 2011).

- Compensatory programs of mitigation could be implemented to provide access to and/or deliberately cultivate patches of culturally significant plants, like the mesquite groves present within the Dry Lake SEZ, on other public lands nearby where tribes have ready access.

- In addition, the BLM should consider assisting the Moapa Band of Paiute Indians with the preparation of forms to nominate identified sacred places as traditional cultural properties, if it is found that all the proper eligibility requirements are met.

The need for and nature of additional SEZ-specific design features would be determined during government-to-government consultation with the affected tribes as part of the process of preparing parcels for competitive offer and subsequent project-specific analysis. Potentially significant sites and landscapes in the vicinity of the SEZ associated with the Salt Song and other trails and trail features; the Moapa Valley; water sources, such as the Apex Pleistocene Lake, Muddy River, Colorado River, and Virgin River; geological features, such as the Arrow Canyon Range and Potato Woman; historical sites such as the Old Spanish Trail/Mormon Road, the railroad, Tabletop Mountain in Arrow Canyon, and the Moapa River Reservation; and traditional plant and animal resources, including the mesquite groves, should be considered and discussed during consultation.

11.3.19 Socioeconomics

11.3.19.1 Affected Environment

Although the boundaries of the Dry Lake SEZ have been reduced compared to the boundaries given in the Draft Solar PEIS, the socioeconomic ROI, the area in which site employees would live and spend their wages and salaries and into which any in-migration would occur, includes the same counties and communities as described in the Draft Solar PEIS, meaning that no updates to the affected environment information given in the Draft Solar PEIS are required.

11.3.19.2 Impacts

Socioeconomic resources in the ROI around the SEZ could be affected by solar energy development through the creation of direct and indirect employment and income, generation of direct sales and income taxes, SEZ acreage rental and capacity payments to the BLM, in-migration of solar facility workers and their families, and impacts on local housing markets and community service employment. The impact assessment has been updated in the following sections.

11.3.19.2.1 Solar Trough

Construction

Total construction employment impacts in the ROI (including direct and indirect impacts) from the use of solar trough technologies would be up to 2,921 jobs (Table 11.3.19.2-1).

TABLE 11.3.19.2-1 ROI Socioeconomic Impacts Assuming Full Build-out of the Proposed Dry Lake SEZ as Revised with Trough Facilities

Parameter	Maximum Annual Construction Impacts[a]	Annual Operations Impacts[b]
Employment (no.)		
Direct	1,744	199
Total	2,921	300
Income[c]		
Total	180.8	11.3
Direct state taxes[c]		
Sales	1.2	0.2
BLM payments[c,d]		
Rental	NA[e]	1.1
Capacity[f]	NA	6.0
In-migrants (no.)	743	25
Vacant housing[g] (no.)	257	16
Local community service employment		
Teachers (no.)	6	0
Physicians (no.)	2	0
Public safety (no.)	2	0

[a] Construction impacts were based on the development at the site in a single year; it was assumed that several facilities with a combined capacity of up to 600 MW (corresponding to 3,000 acres [12 km^2] of land disturbance) could be built.

[b] Operations impacts were based on full build-out of the site, producing a total output of 915 MW.

[c] Values are reported in $ million 2008.

[d] There is currently no individual income tax in Nevada.

[e] NA = not applicable.

[f] The BLM annual capacity payment was based on a fee of $6,570/MW, established by the BLM in its Solar Energy Interim Rental Policy (BLM 2010), assuming a solar facility with no storage capability and full build-out of the site. Projects with 3 or more hours of storage would generate higher payments, based on a fee of $7,884/MW.

[g] Construction activities would affect vacant rental housing; operations activities would affect vacant owner-occupied housing.

Construction activities would constitute 0.2% of total ROI employment. A solar facility would also produce $180.8 million in income. Direct sales taxes would be $1.2 million.

Given the scale of construction activities and the low likelihood that the entire construction workforce in the required occupational categories would be available in the local community, construction of a solar facility would mean that some in-migration of workers and their families from outside the ROI would be required, with up to 743 persons in-migrating into the ROI. Although in-migration may potentially affect local housing markets, the relatively small number of in-migrants and the availability of temporary accommodations (hotels, motels, and mobile home parks) in the ROI mean that the impact of solar facility construction on the number of vacant rental housing units would not be expected to be large, with up to 257 rental units expected to be occupied in the ROI. This occupancy rate would represent 0.5% of the vacant rental units expected to be available in the ROI.

In addition to the potential impact on housing markets, in-migration would affect community service employment (education, health, and public safety). An increase in such employment would be required to meet existing levels of service in the ROI. Accordingly, up to six new teachers, two physicians, and two public safety employee (career firefighters and uniformed police officers) would be required in the ROI. These increases would represent less than 0.1% of total ROI employment expected in these occupations.

Operations

Total operations employment impacts in the ROI (including direct and indirect impacts) of a full build-out of the SEZ using solar trough technologies would be 300 jobs (Table 11.3.19.2-1). Such a solar facility would also produce $11.3 million in income. Direct sales taxes would be $0.2 million. On the basis of fees established by the BLM in its Solar Energy Interim Rental Policy (BLM 2010), acreage rental payments would be $1.1 million, and solar generating capacity payments would total at least $6.0 million.

As for the construction workforce, operation of a solar facility likely would require some in-migration of workers and their families from outside the ROI, with up to 25 persons in-migrating into the ROI. Although in-migration may potentially affect local housing markets, the relatively small number of in-migrants and the availability of temporary accommodations (hotels, motels, and mobile home parks) mean that the impact of solar facility operation on the number of vacant owner-occupied housing units would not be expected to be large, with up to 16 owner-occupied units expected to be occupied in the ROI.

No new community service employment would be required to meet existing levels of service in the ROI.

11.3.19.2.2 Power Tower

Construction

Total construction employment impacts in the ROI (including direct and indirect impacts) from the use of power tower technologies would be up to 1,163 jobs (Table 11.3.19.2-2). Construction activities would constitute 0.1% of total ROI employment. Such a solar facility would also produce $72.0 million in income. Direct sales taxes would be $0.5 million.

Given the scale of construction activities and the low likelihood that the entire construction workforce in the required occupational categories would be available in the ROI, construction of a solar facility would mean that some in-migration of workers and their families from outside the ROI would be required, with up to 296 persons in-migrating into the ROI. Although in-migration may potentially affect local housing markets, the relatively small number of in-migrants and the availability of temporary accommodations (hotels, motels, and mobile home parks) mean that the impact of solar facility construction on the number of vacant rental housing units would not be expected to be large, with up to 102 rental units expected to be occupied in the ROI. This occupancy rate would represent 0.2% of the vacant rental units expected to be available in the ROI.

In addition to the potential impact on housing markets, in-migration would affect community service (education, health, and public safety) employment. An increase in such employment would be required to meet existing levels of service in the ROI. Accordingly, up to three new teachers, one physician, and one public safety employee would be required in the ROI. These increases would represent less than 0.1% of total ROI employment expected in these occupations.

Operations

Total operations employment impacts in the ROI (including direct and indirect impacts) of a full build-out of the SEZ using power tower technologies would be 137 jobs (Table 11.3.19.2-2). Such a solar facility would also produce $4.7 million in income. Direct sales taxes would be less than $0.1 million. On the basis of fees established by the BLM (BLM 2010), acreage rental payments would be $1.1 million, and solar generating capacity payments would total at least $3.3 million.

As for the construction workforce, operation of a solar facility likely would require some in-migration of workers and their families from outside the ROI, with up to 36 persons in-migrating into the ROI. Although in-migration may potentially affect local housing markets, the relatively small number of in-migrants and the availability of temporary accommodations (hotels, motels, and mobile home parks) mean that the impact of solar facility operation on the number of vacant owner-occupied housing units would not be expected to be large, with up to 32 owner-occupied units expected to be required in the ROI.

TABLE 11.3.19.2-2 ROI Socioeconomic Impacts Assuming Full Build-out of the Proposed Dry Lake SEZ as Revised with Power Tower Facilities

Parameter	Maximum Annual Construction Impacts[a]	Annual Operations Impacts[b]
Employment (no.)		
Direct	695	103
Total	1,163	137
Income[c]		
Total	72.0	4.7
Direct state taxes[c]		
Sales	0.5	<0.1
BLM payments[c,d]		
Rental	NA[e]	1.1
Capacity[f]	NA	3.3
In-migrants (no.)	296	13
Vacant housing[g] (no.)	102	8
Local community service employment		
Teachers (no.)	3	0
Physicians (no.)	1	0
Public safety (no.)	1	0

[a] Construction impacts were based on the development at the site in a single year; it was assumed that several facilities with a combined capacity of up to 333 MW (corresponding to 3,000 acres [12 km^2] of land disturbance) could be built.

[b] Operations impacts were based on full build-out of the site, producing a total output of 508 MW.

[c] Values are reported in $ million 2008.

[d] There is currently no individual income tax in Nevada.

[e] NA = not applicable.

[f] The BLM annual capacity payment was based on a fee of $6,570/MW, established by the BLM in its Solar Energy Interim Rental Policy (BLM 2010), assuming a solar facility with no storage capability and full build-out of the site. Projects with three or more hours of storage would generate higher payments, based on a fee of $7,884/MW.

[g] Construction activities would affect vacant rental housing; operations activities would affect vacant owner-occupied housing.

No new community service employment would be required to meet existing levels of service in the ROI.

11.3.19.2.3 Dish Engine

Construction

Total construction employment impacts in the ROI (including direct and indirect impacts) from the use of dish engine technologies would be up to 473 jobs (Table 11.3.19.2-3). Construction activities would provide less than 0.1% of total ROI employment. Such a solar facility would also produce $29.3 million in income. Direct sales taxes would be $0.2 million.

Given the scale of construction activities and the low likelihood that the entire construction workforce in the required occupational categories would be available in the ROI, construction of a solar facility would mean that some in-migration of workers and their families from outside the ROI would be required, with up to 120 persons in-migrating into the ROI. Although in-migration may potentially affect local housing markets, the relatively small number of in-migrants and the availability of temporary accommodations (hotels, motels, and mobile home parks) mean that the impact of solar facility construction on the number of vacant rental housing units would not be expected to be large, with up to 42 rental units expected to be occupied in the ROI. This occupancy rate would represent 0.1% of the vacant rental units expected to be available in the ROI.

In addition to the potential impact on housing markets, in-migration would affect community service (education, health, and public safety) employment. An increase in such employment would be required to meet existing levels of service in the ROI. Accordingly, up to one new teacher would be required in the ROI. This increase would represent less than 0.1% of total ROI employment expected in these occupations.

Operations

Total operations employment impacts in the ROI (including direct and indirect impacts) of a full build-out of the SEZ using dish engine technologies would be 133 jobs (Table 11.3.19.2-3). Such a solar facility would also produce $4.6 million in income. Direct sales taxes would be less than $0.1 million. On the basis of fees established by the BLM (BLM 2010), acreage rental payments would be $1.1 million, and solar generating capacity payments would total at least $3.3 million.

As for the construction workforce, operation of a dish engine solar facility likely would require some in-migration of workers and their families from outside the ROI, with up to 13 persons in-migrating into the ROI. Although in-migration may potentially affect local housing markets, the relatively small number of in-migrants and the availability of temporary accommodations (hotels, motels, and mobile home parks) mean that the impact of solar facility

TABLE 11.3.19.2-3 ROI Socioeconomic Impacts Assuming Full Build-out of the Proposed Dry Lake SEZ as Revised with Dish Engine Facilities

Parameter	Maximum Annual Construction Impacts[a]	Annual Operations Impacts[b]
Employment (no.)		
Direct	282	100
Total	473	133
Income[c]		
Total	29.3	4.6
Direct state taxes[c]		
Sales	0.2	<0.1
BLM payments[c,d]		
Rental	NA[e]	1.1
Capacity[f]	NA	3.3
In-migrants (no.)	120	13
Vacant housing[g] (no.)	42	8
Local community service employment		
Teachers (no.)	1	0
Physicians (no.)	0	0
Public safety (no.)	0	0

[a] Construction impacts were based on the development at the site in a single year; it was assumed that several facilities with a combined capacity of up to 333 MW (corresponding to 3,000 acres [12 km^2] of land disturbance) could be built.

[b] Operations impacts were based on full build-out of the site, producing a total output of 508 MW.

[c] Values are reported in $ million 2008.

[d] There is currently no individual income tax in Nevada.

[e] NA = not applicable.

[f] The BLM annual capacity payment was based on a fee of $6,570/MW, established by the BLM in its Solar Energy Interim Rental Policy (BLM 2010), assuming a solar facility with no storage capability and full build-out of the site. Projects with three or more hours of storage would generate higher payments, based on a fee of $7,884/MW.

[g] Construction activities would affect vacant rental housing; operations activities would affect vacant owner-occupied housing.

operation on the number of vacant owner-occupied housing units would not be expected to be large, with up to 8 owner-occupied units expected to be required in the ROI.

No new community service employment would be required to meet existing levels of service in the ROI.

11.3.19.2.4 Photovoltaic

Construction

Total construction employment impacts in the ROI (including direct and indirect impacts) from the use of PV technologies would be up to 221 jobs (Table 11.3.19.2-4). Construction activities would constitute less than 0.1 % of total ROI employment. Such a solar development would also produce $13.7 million in income. Direct sales taxes would be $0.1 million.

Given the scale of construction activities and the low likelihood that the entire construction workforce in the required occupational categories would be available in the ROI, construction of a solar facility would mean that some in-migration of workers and their families from outside the ROI would be required, with up to 56 persons in-migrating into the ROI. Although in-migration may potentially affect local housing markets, the relatively small number of in-migrants and the availability of temporary accommodations (hotels, motels, and mobile home parks) mean that the impact of solar facility construction on the number of vacant rental housing units would not be expected to be large, with up to 19 rental units expected to be occupied in the ROI. This occupancy rate would represent less than 0.1% of the vacant rental units expected to be available in the ROI.

No new community service employment would be required to meet existing levels of service in the ROI.

Operations

Total operations employment impacts in the ROI (including direct and indirect impacts) of a full build-out of the SEZ using PV technologies would be 13 jobs (Table 11.3.19.2-4). Such a solar facility would also produce $0.5 million in income. Direct sales taxes would be less than $0.1 million. On the basis of fees established by the BLM in its Solar Energy Interim Rental Policy (BLM 2010), acreage rental payments would be $1.1 million, and solar generating capacity payments would total at least $2.7 million.

As for the construction workforce, operation of a PV solar facility would likely require some in-migration of workers and their families from outside the ROI, with up to one person in-migrating into the ROI. Although in-migration may potentially affect local housing markets, the very small number of in-migrants and the availability of temporary accommodations (hotels, motels, and mobile home parks) mean that the impact of solar facility operation on the number of

TABLE 11.3.19.2-4 ROI Socioeconomic Impacts Assuming Full Build-out of the Proposed Dry Lake SEZ as Revised with PV Facilities

Parameter	Maximum Annual Construction Impacts[a]	Annual Operations Impacts[b]
Employment (no.)		
Direct	132	10
Total	221	13
Income[c]		
Total	13.7	0.5
Direct state taxes[c]		
Sales	0.1	<0.1
BLM payments[c,d]		
Rental	NA[e]	1.1
Capacity[f]	NA	2.7
In-migrants (no.)	56	1
Vacant housing[g] (no.)	19	1
Local community service employment		
Teachers (no.)	0	0
Physicians (no.)	0	0
Public safety (no.)	0	0

[a] Construction impacts were based on the development at the site in a single year; it was assumed that several facilities with a combined capacity of up to 333 MW (corresponding to 3,000 acres [12 km^2] of land disturbance) could be built.

[b] Operations impacts were based on full build-out of the site, producing a total output of 508 MW.

[c] Values are reported in $ million 2008.

[d] There is currently no individual income tax in Nevada.

[e] NA = not applicable.

[f] The BLM annual capacity payment was based on a fee of $6,570/MW, established by the BLM in its Solar Energy Interim Rental Policy (BLM 2010), assuming a solar facility with no storage capability and full build-out of the site. Projects with three or more hours of storage would generate higher payments, based on a fee of $7,884/MW.

[g] Construction activities would affect vacant rental housing; operations activities would affect vacant owner-occupied housing.

vacant owner-occupied housing units would not be expected to be large, with up to one owner-occupied unit expected to be required in the ROI.

No new community service employment would be required to meet existing levels of service in the ROI.

11.3.19.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce socioeconomic impacts are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will reduce the potential for socioeconomic impacts during all project phases.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features to address socioeconomic impacts have been identified for the proposed Dry Lake SEZ. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

11.3.20 Environmental Justice

11.3.20.1 Affected Environment

The data presented in the Draft Solar PEIS are not substantially changed due to the change in boundaries of the proposed Dry Lake SEZ. There are no minority or low-income populations in the Arizona or Nevada portions of the 50-mi (80-km) radius of the SEZ as a whole. There are block groups with minority populations more than 20 percentage points higher than the state average located in the City of Las Vegas, to the west of the downtown area, and in one block group to the northeast of the city. Census block groups within the 50-mi (80-km) radius where the low-income population is more than 20 percentage points higher than the state average are located in the City of Las Vegas, in the downtown area.

11.3.20.2 Impacts

Potential impacts (e.g., from noise and dust during construction and operations, visual impacts, cultural impacts, and effects on property values) on low-income and minority populations could be incurred as a result of the construction and operation of solar facilities involving each of the four technologies. Impacts are likely to be small to moderate, and there are no minority populations defined by CEQ guidelines (CEQ 1997) and no low-income populations (Section 11.3.20.1) within the 50-mi (80-km) radius around the boundary of the

SEZ. This means that any adverse impacts of solar projects would not disproportionately affect minority and/or low-income populations.

11.3.20.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce potential environmental justice impacts are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will reduce the potential for environmental justice impacts.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for environmental justice have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

11.3.21 Transportation

11.3.21.1 Affected Environment

The reduction in developable area of the proposed Dry Lake SEZ does not change the information on affected environment provided in the Draft Solar PEIS.

11.3.21.2 Impacts

As stated in the Draft Solar PEIS, the primary transportation impacts are anticipated to be from commuting worker traffic. Single projects could involve up to 1,000 workers each day, with an additional 2,000 vehicle trips per day (maximum). The volume of traffic on I-15 would represent an increase in traffic of about 10% in the area of the SEZ. Such traffic levels would represent a 100% increase in the traffic level experienced on U.S. 93 north of its junction with I-15 if all project traffic were routed through U.S. 93. Because higher traffic volumes would be experienced during shift changes, traffic on I-15 could experience minor slowdowns during these time periods near exits in the vicinity of the SEZ where projects are located. Local road improvements would be necessary in the vicinity of exits off I-15 or on any portion of U.S. 93 that might be developed so as not to overwhelm the local access roads near any site access point(s).

Solar development within the SEZ would affect public access along OHV routes that are designated open and available for public use. Although open routes crossing areas granted ROWs for solar facilities could be redesignated as closed (see Section 5.5.1 of the Draft Solar PEIS), a programmatic design feature has been included under Recreation (Section A.2.2.6.1 of Appendix A) that requires consideration of replacement of lost OHV route acreage and of access across and to public lands.

11.3.21.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce transportation impacts are described in Section A.2.2 of Appendix A of this Final Solar PEIS. The programmatic design features, including local road improvements, multiple site access locations, staggered work schedules, and ride-sharing, would all provide some relief to traffic congestion on local roads leading to the SEZ. Depending on the location of solar facilities within the SEZ, more specific access locations and local road improvements could be implemented.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features to address transportation impacts in the proposed Dry Lake SEZ have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

11.3.22 Cumulative Impacts

The analysis of potential impacts in the vicinity of the proposed Dry Lake SEZ presented in the Draft Solar PEIS is still generally applicable for this Final Solar PEIS, although the impacts would be decreased because the size of the developable area of the proposed SEZ has been reduced to 5,717 acres (23 km^2). The following sections include an update to the information presented in the Draft Solar PEIS regarding cumulative effects for the proposed Dry Lake SEZ.

11.3.22.1 Geographic Extent of the Cumulative Impact Analysis

The geographic extent of the cumulative impact analysis has not changed. The extent varies on the basis of the nature of the resource being evaluated and the distance at which the impact may occur (e.g., air quality impacts may have a greater geographic extent than impacts on visual resources). The BLM, USFWS, NPS, and DoD administer most of the land around the SEZ; there are also some nearby tribal lands at the Moapa River Indian Reservation adjacent to the northeast boundary of the SEZ. The BLM administers approximately 45.4% of the lands within a 50-mi (80-km) radius of the SEZ.

11.3.22.2 Overview of Ongoing and Reasonably Foreseeable Future Actions

The proposed Dry Lake SEZ decreased from 15,649 acres (63 km^2) to 6,186 acres (25 km^2, with an additional 460 acres (1.9 km^2) within the SEZ identified as non-development areas. The Draft Solar PEIS included six other proposed SEZs in Nevada. Two of these, Delamar Valley and East Mormon Mountain, have been removed from consideration.

There are 12 pending ROW applications for solar facilities within 50 mi (80 km) of the Dry Lake SEZ that could generate up to 4,145 MW of electricity on public lands in Nevada (see the full list of pending applications in Table B-1 of Appendix B of this Final Solar PEIS). However, these applications are in various stages of approval, and environmental assessments have not been completed. As of the end of October 2011, these 12 pending solar applications were not considered reasonably foreseeable future actions.

The ongoing and reasonably foreseeable future actions described below are grouped into two categories: (1) actions that relate to energy production and distribution (Section 11.3.22.2.1); and (2) other ongoing and reasonably foreseeable actions, including those related to electric power generation, water management, natural gas and petroleum distribution, communication systems, residential development, and mining (Section 11.3.22.2.2). Together, these actions and trends have the potential to affect human and environmental receptors within the geographic range of potential impacts over the next 20 years.

11.3.22.2.1 Energy Production and Distribution

The list of reasonably foreseeable future actions that relate to energy production and distribution, including potential solar energy projects under the proposed action, near the proposed Dry Lake SEZ has been updated and is presented in Table 11.3.22.2-1. Projects listed in the table are shown in Figure 11.3.22.2-1. Most of these projects were described in the Draft Solar PEIS; projects not described there are discussed below.

Moapa Solar Project

K Road Power proposes to construct and operate a 350-MW PV power plant on a 2,153-acre (8.7-km^2) site located on the Moapa River Indian Reservation, approximately 5 mi (8 km) east of the proposed Dry Lake SEZ. The project also includes the construction and operation of an 8-mi (13-km) long, up to 500-kV transmission line to the Crystal Substation; a 1-mi (1.6-km) water pipeline; and a 3-mi (5-km) long, 12-kV transmission line linking the Moapa Travel Plaza to the proposed project substation.

The proposed facility would have an estimated water requirement of 72 ac-ft/yr (88,800 m^3/yr) during construction and up to 20 to 40 ac-ft/yr (25,000 to 50,000 m^3/yr) of water during operation. Water will be drawn from an on-site well. Construction of the facility will require approximately 400 workers at the peak of construction. Operation and maintenance of the facility will require 35 full-time workers (BLM 2011d). A Desert Tortoise Relocation Plan will be instituted to remove the tortoises prior to construction and move them to suitable habitat on the reservation.

TABLE 11.3.22.2-1 Ongoing and Reasonably Foreseeable Future Actions Related to Energy Development and Distribution near the Proposed Dry Lake SEZ as Revised[a]

Description	Status	Resources Affected	Primary Impact Location
Renewable Energy Projects on BLM-Administered lands			
Mohave County Wind Farm (AZA 32315), 500 MW, 31,338 acres[b]	**NOI No. 2, July 26, 2010 Plan of Development August 10, 2010[c]**	Terrestrial habitats, wildlife cultural resources, land use	40 mi[d] southeast of the SEZ in Arizona
Renewable Energy Projects on Private Lands			
Copper Mountain Solar 2 (Boulder City Solar), 150-MW PV, 1,100 acres	**Construction to begin in early 2012[e]**	Terrestrial habitats, wildlife, cultural resources, land use	40 mi south of the SEZ
Copper Mountain Solar 1 (El Dorado Solar Expansion), **48-MW** PV, **380 acres**	**Operating[f]**	Terrestrial habitats, wildlife, cultural resources, land use	45 mi south of the SEZ
Moapa Solar Project (NVN-89176), 350-MW PV, 2,153 acres, transmission line requires BLM ROW authorization	**DEIS November 2011[g]**	**Terrestrial habitats, wildlife, cultural resources, land use**	**5 mi east of the SEZ**
BrightSource Coyote Springs Project, **400-MW** solar tower, 7,680 acres	Planning stage	Terrestrial habitats, vegetation, wildlife, soil, water, visual, cultural	15 mi north of the SEZ
BrightSource Overton Project, 400-MW solar tower	Planning stage	Terrestrial habitats, vegetation, wildlife, soil, water, visual, cultural	30 mi northeast of the SEZ
Transmission and Distribution Systems			
One Nevada Transmission Line Project	**ROD March 1, 2011[h]**	Disturbed areas, terrestrial habitats along transmission line ROW	Corridor passes through the SEZ
Southwest Intertie Project	FONSI July 30, 2008; FEIS January 2010[i] **Under construction; expected first operation 2012**	Disturbed areas, terrestrial habitats along transmission line ROW	Corridor passes through the SEZ

TABLE 11.3.22.2-1 (Cont.)

Description	Status	Resources Affected	Primary Impact Location
Transmission and Distribution Systems (Cont.)			
TransWest Transmission Project	**NOI January 4, 2011[j]**	Disturbed areas, terrestrial habitats along transmission line ROW	Corridor passes through the SEZ
Zephyr and Chinook Transmission Line Project	**Permit Applications January 28, 2011[k]**	Disturbed areas, terrestrial habitats along transmission line ROW	Corridor passes near or through the SEZ

[a] Includes projects in later stages of agency environmental review and project development. For projects on BLM-administered lands, includes those approved in 2010 and priority projects for 2011 and 2012 (see BLM 2012b). Projects with status changed from that given in the Draft Solar PEIS are shown in bold text.

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

[c] See BP Wind Energy North America Inc. (2011) for details.

[d] To convert mi to km, multiply by 1.609.

[e] See Sempra U.S. Gas & Power (2012a) for details.

[f] See Sempra U.S. Gas & Power (2012b) for details.

[g] See BLM (2011d) for details.

[h] See BLM (2011e) for details.

[i] See Western (2010) for details.

[j] See BLM (2011f) for details.

[k] See TransCanada (2011) for details.

11.3.22.2.2 Other Actions

A number of energy production facilities are located within a 50-mi (80-km) radius from the center of the Dry Lake SEZ, which includes portions of Clark and Lincoln Counties in Nevada, Washington County in Utah, and Mohave County in Arizona. Other major ongoing and foreseeable actions within 50 mi (80 km) of the proposed Dry Lake SEZ have been updated and are listed in Table 11.3.22.2-2. These projects were described in the Draft Solar PEIS.

11.3.22.3 General Trends

The information on general trends presented in the Draft Solar PEIS remains valid.

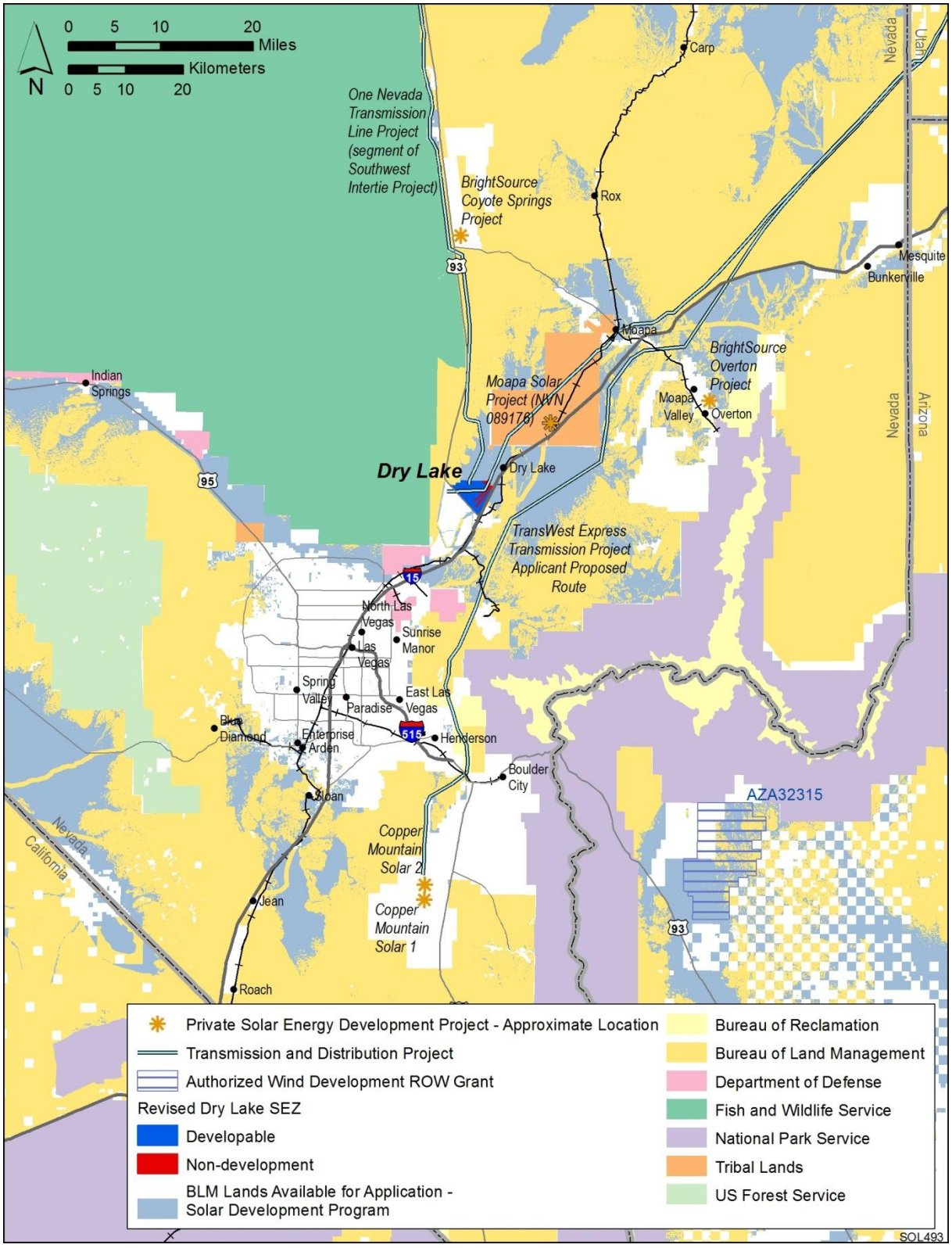

FIGURE 11.3.22.2-1 Locations of Existing and Reasonably Foreseeable Renewable Energy Projects on Public Land within a 50-mi (80-km) Radius of the Proposed Dry Lake SEZ as Revised

TABLE 11.3.22.2-2 Other Ongoing and Foreseeable Actions near the Proposed Dry Lake SEZ as Revised[a]

Description	Status	Resources Affected	Primary Impact Location[b]
Renewable Energy Projects			
El Dorado Solar	Operating since 2009	Terrestrial habitats, wildlife, visual	45 mi south of the SEZ
Nellis Air Force Base Solar	Operating since 2007	Terrestrial habitats, wildlife, visual	10 mi south of the SEZ
Nevada Solar One	Operating since 2007	Terrestrial habitats, wildlife, water, cultural, visual	40 mi south of the SEZ
Sithe Global Flat Top Mesa Solar	Proposed	Terrestrial habitats, wildlife, cultural, visual	42 mi northeast of the SEZ
Other Energy Projects			
Apex Generating Station	Operating since 2003	Terrestrial habitats, wildlife, water, air, cultural, visual	Adjacent to the SEZ
Chuck Lenzie Generating Station	Operating since 2006	Terrestrial habitats, wildlife, water, air, cultural, visual	Adjacent to the SEZ
Edward W. Clark Generating Station	Operating since 1973	Terrestrial habitats, wildlife, water, air, cultural, visual	25 mi southwest of the SEZ
El Dorado Energy Generating Station	Operating since 2000	Terrestrial habitats, wildlife, water, air, cultural, visual	45 mi south of the SEZ
Goodsprings Waste Heat Recovery Facility	EA and FONSI September 2009	Threatened and endangered species, air, visual	50 mi southwest of the SEZ
Harry Allen Generating Station	Operating since early 1980s	Terrestrial habitats, wildlife, water, air, cultural, visual	Within the SEZ
Harry Allen Expansion	Under construction	Terrestrial habitats, wildlife, water, air, cultural, visual	Within the SEZ

TABLE 11.3.22.2-2 (Cont.)

Description	Status	Resources Affected	Primary Impact Location
Other Energy Projects (Cont.)			
Reid Gardner Generating Station	Operating since 1965	Terrestrial habitats, wildlife, water, air, cultural, visual	20 mi northeast of the SEZ
Reid Gardner Expansion	EA and FONSI March 2008	Terrestrial habitats, wildlife, soil, air, water	20 mi northeast of the SEZ
Saguaro Power Company	Operating since 2000	Terrestrial habitats, wildlife, water, air, cultural, visual	20 mi south of the SEZ
Silverhawk Generating Station	Operating since 2004	Terrestrial habitats, wildlife, water, air, cultural, visual	Adjacent to the SEZ
Sunrise Generating Station	Operating since 1964	Terrestrial habitats, wildlife, water, air, cultural, visual	20 mi south of the SEZ
Toquop Energy Project	Coal-fired plant FEIS 2009, changed to natural gas in 2010	Terrestrial habitats, wildlife, soil, water, air, cultural, visual	50 mi northeast of the SEZ
Distribution Systems			
Kern River Gas Transmission System	Operating since 1992	Disturbed areas, terrestrial habitats along pipeline ROW	Corridor passes through the SEZ
UNEV Pipeline Project	FEIS April 2010, **under construction**	Disturbed areas, terrestrial habitats along pipeline ROW	Corridor passes through the SEZ
Other Projects			
Arizona Nevada Tower Corporation Communication Sites	EA issued April 2007	Terrestrial habitats, wildlife, cultural resources	West and north of the SEZ

TABLE 11.3.22.2-2 (Cont.)

Description	Status	Resources Affected	Primary Impact Location
Other Projects (Cont.)			
Clark, Lincoln, and White Pine Counties Groundwater Development Project	**DEIS June 2011**	Terrestrial habitats, wildlife, groundwater	Within the SEZ
Coyote Springs Investment Planned Development Project	FEIS Sept. 2008, ROD October 2008	Terrestrial habitats, wildlife, water, socioeconomics	15 mi north of the SEZ
Dry Lake Groundwater Testing/ Monitoring Wells	EA and FONSI September 2009	Terrestrial habitats, wildlife cultural resources	Within the SEZ
Lincoln County Land Act Groundwater Development and Utility ROW	FEIS May 2009, ROD January 2010	Terrestrial habitats, wildlife, groundwater	45 mi northeast of the SEZ
Meadow Valley Gypsum Project	EA and FONSI 2008	Terrestrial habitats, wildlife, soils, socioeconomics	35 mi northeast of the SEZ
Mesquite Nevada General Aviation Replacement Airport	DEIS April 2008**, project cancelled**[c]	Land use, terrestrial habitats, wildlife, soil, water, air, cultural, visual	40 mi northeast of the SEZ
NV Energy Microwave and Mobile Radio Project	**Draft FONSI July 2010**	Terrestrial habitats, wildlife, cultural resources	Two sites within the SEZ, one site 45 mi north of the SEZ

[a] Projects with status changed from that given in the Draft Solar PEIS are shown in bold text.

[b] To convert mi to km, multiply by 1.609.

[c] See FAA (2011) for details.

11.3.22.4 Cumulative Impacts on Resources

Total disturbance over 20 years in the proposed Dry Lake SEZ would be about 4,574 acres (18.5 km^2) (80% of the developable area of the proposed SEZ). This development would contribute incrementally to the impacts from other past, present, and reasonably foreseeable future actions in the region as described in the Draft Solar PEIS. Primary impacts from development in the Dry Lake SEZ may include impacts on water quantity and quality, air quality, ecological resources such as habitat and species, cultural and visual resources, and specially designated lands.

Activities in the region that will contribute to cumulative impacts include one additional solar PV project that was not addressed in the Draft Solar PEIS: the proposed Moapa Solar Project (350 MW) located 5 mi (8 km) east of the SEZ on a 2,153-acre (8.7-km^2) site on the Moapa River Indian Reservation. The proposed facility would have an estimated water requirement of 72 ac-ft/yr (88,800 m^3/yr) during construction and up to 20 to 40 ac-ft/yr (25,000 to 50,000 m^3/yr) of water during operations. Water will be drawn from an on-site well. A Desert Tortoise Relocation Plan will be instituted to remove the tortoises prior to construction and move them to suitable habitat on the reservation. The Mesquite Replacement Airport, which would have required the BLM to release 2,560 acres (10.4 km^2) to the City of Mesquite, has been cancelled. The Coyote Springs Development has not yet begun, and if it does not become a reality, then the estimated 70,000 ac-ft/yr (86 million m^3/yr) would not be needed and the 21,454 acres (86.8 km^2) would potentially remain undeveloped. In addition, this is desert tortoise habitat, and relocations would not be required if the development does not occur.

Overall, the incremental cumulative impacts associated with the development in the proposed Dry Lake SEZ during construction, operation, and decommissioning are expected to be less than those provided in the Draft Solar PEIS. This is because the proposed Dry Lake SEZ decreased from 15,649 acres (63 km^2) to 6,186 acres (25 km^2), an additional 460 acres (1.9 km^2) within the SEZ were identified as non-development areas, and the Mesquite Replacement Airport project was cancelled.

11.3.23 Transmission Analysis

The methodology for this transmission analysis is described in Appendix G of this Final Solar PEIS. This section presents the results of the transmission analysis for the Dry Lake SEZ, including the identification of potential load areas to be served by power generated at the SEZ and the results of the DLT analysis. Unlike Sections 11.3.2 through 11.3.22, this section is not an update of previous analysis for the Dry Lake SEZ; this analysis was not presented in the Draft Solar PEIS. However, the methodology and a test case analysis were presented in the Supplement to the Draft. Comments received on the material presented in the Supplement were used to improve the methodology for the assessment presented in this Final Solar PEIS.

On the basis of its size, the assumption of a minimum of 5 acres (0.02 km^2) of land required per MW, and the assumption of a maximum of 80% of the land area developed, the

Dry Lake SEZ is estimated to have the potential to generate 915 MW of marketable solar power at full build-out.

11.3.23.1 Identification and Characterization of Load Areas

The primary candidates for Dry Lake SEZ load areas are the major surrounding cities. Figure 11.3.23.1-1 shows the possible load areas for the Dry Lake SEZ and the estimated portion of their market that could be served by solar generation. Possible load areas for the Dry Lake SEZ include Phoenix, Arizona; Salt Lake City, Utah; Las Vegas and Reno, Nevada; and Los Angeles, San Jose, San Francisco, Oakland, and Sacramento, California.

The two load area groups examined for the Dry Lake SEZ are as follows:

1. Las Vegas, Nevada; and

2. Los Angeles, California; and Phoenix, Arizona.

Figure 11.3.23.1-2 shows the most economically viable transmission scheme for the Dry Lake SEZ (transmission scheme 1), and Figure 11.3.23.1-3 shows an alternative transmission

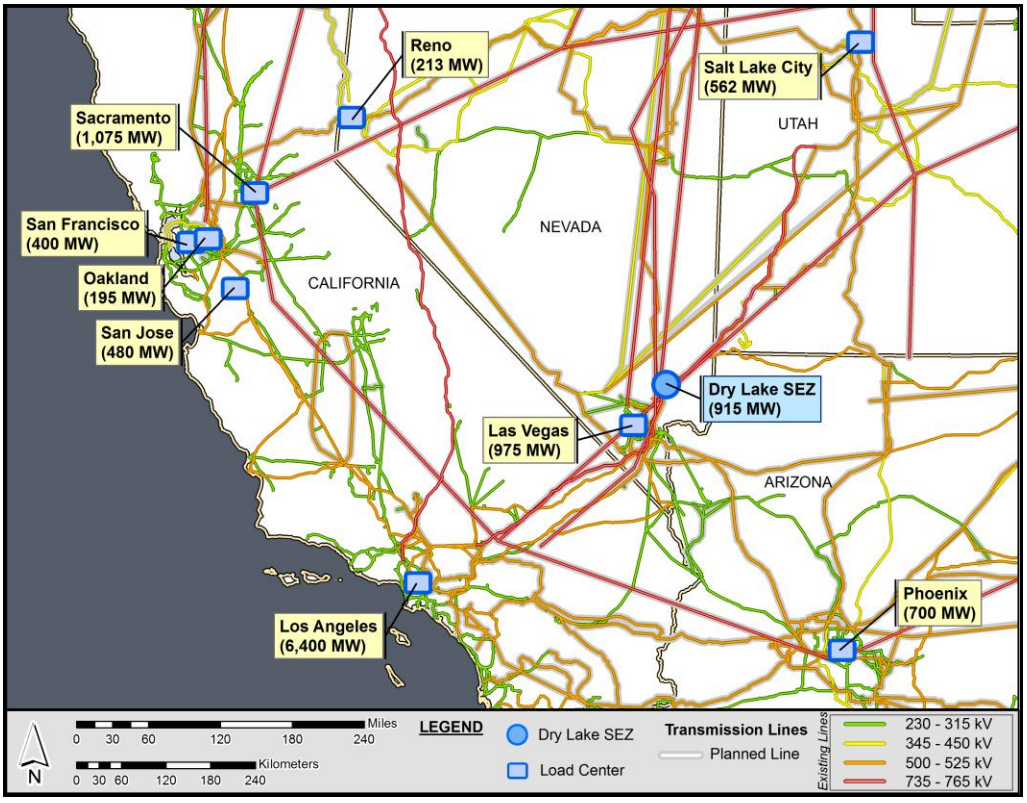

FIGURE 11.3.23.1-1 Location of the Proposed Dry Lake SEZ and Possible Load Areas (Source for background map: Platts 2011)

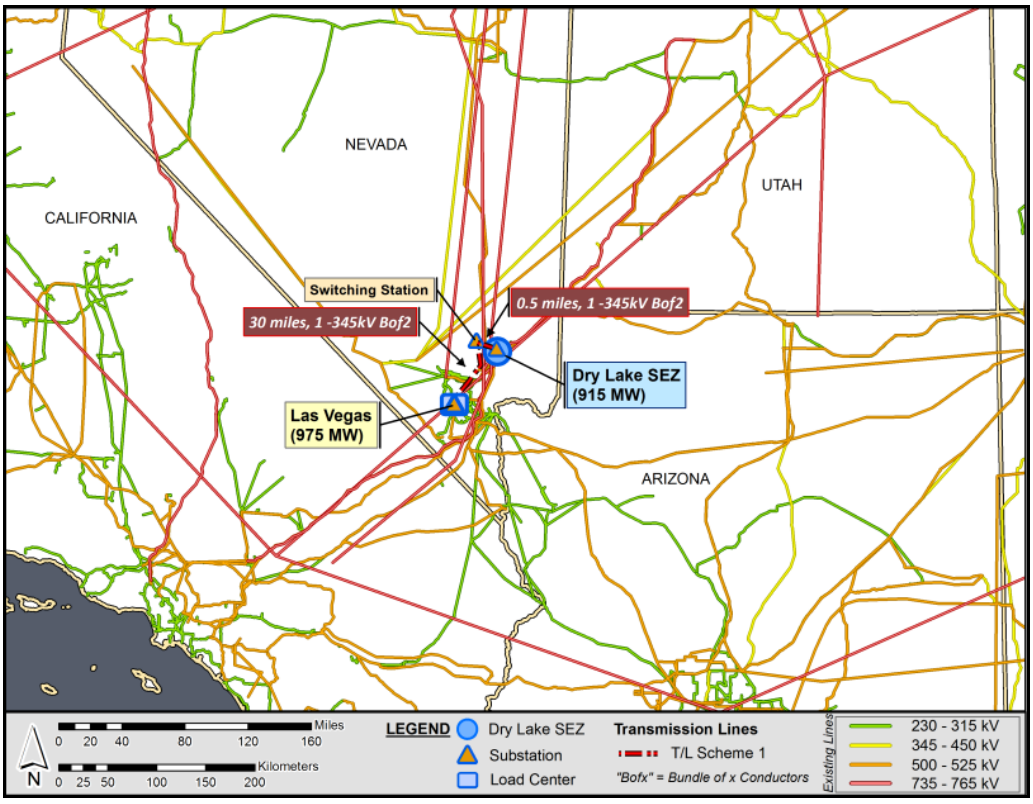

FIGURE 11.3.23.1-2 Transmission Scheme 1 for the Proposed Dry Lake SEZ (Source for background map: Platts 2011)

scheme (transmission scheme 2) that represents a logical choice should transmission scheme 1 be infeasible. As described in Appendix G, the alternative shown in transmission scheme 2 represents the optimum choice if one or more of the primary linkages in transmission scheme 1 are excluded from consideration. The groups provide for linking loads along alternative routes so that the SEZ's output of 915 MW could be fully allocated.

Table 11.3.23.1-1 summarizes and groups the load areas according to their associated transmission scheme and provides details on how the megawatt load for each area was estimated.

11.3.23.2 Findings for the DLT Analysis

The DLT analysis approach assumes that the Dry Lake SEZ will require all new construction for transmission lines (i.e., dedicated lines) and substations. The new transmission lines(s) would directly convey the 915-MW output of the Dry Lake SEZ to the prospective load areas for each possible transmission scheme. The approach also assumes that all existing transmission lines in the WECC region are saturated and have little or no available capacity to accommodate the SEZ's output throughout the entire 10-year study horizon.

FIGURE 11.3.23.1-3 Transmission Scheme 2 for the Proposed Dry Lake SEZ (Source for background map: Platts 2011)

TABLE 11.3.23.1-1 Candidate Load Area Characteristics for the Proposed Dry Lake SEZ

Transmission Scheme	City/Load Area Name	Position Relative to SEZ	2010 Population[c]	Estimated Total Peak Load (MW)	Estimated Peak Solar Market (MW)
1	Las Vegas, Nevada[a]	Southwest	1,950,000	4,875	975
2	Los Angeles, California[a]	Southwest	12,800,000	32,072	6,400
	Phoenix, Arizona[b]	Southeast	1,400,000	3,500	700

[a] The load area represents the metropolitan area (i.e., the identified city plus adjacent communities).

[b] The load area represents the city named.

[c] City and metropolitan area population data are from 2010 Census data (U.S. Bureau of the Census 2010).

Figures 11.3.23.1-2 and 11.3.23.1-3 display the pathways that new dedicated lines might follow to distribute solar power generated at Dry Lake SEZ via the two identified transmission schemes described in Table 11.3.23.1-1. These pathways parallel existing 500-, 345-, 230-kV, and/or lower voltage lines. The intent of following existing lines is to avoid pathways that may be infeasible due to topographical limitations or other concerns.

For transmission scheme 1, a new line would be constructed to connect with Las Vegas (975 MW), so that the 915-MW output of the Dry Lake SEZ could be fully utilized (Figure 11.3.23.1-2). This particular scheme has two segments. The first segment extends to the northwest from the SEZ to the first switching station over a distance of about 0.5 mi (0.8 km). This segment would require a single-circuit 345-kV (1–345 kV) bundle of two conductors (Bof2) transmission line design based on engineering and operational considerations. The second and final leg runs about 30 mi (48 km) from the first switching station to Las Vegas. In general, the transmission configuration options were determined by using the line "loadability" curve provided in American Electric Power's *Transmission Facts* (AEP 2010). Appendix G documents the line options used for this analysis and describes how the load area groupings were determined.

Transmission scheme 2, which for the purpose of analysis assumes the Las Vegas market is not available, serves load centers to the south and southwest. Figure 11.3.23.1-3 shows that new lines would be constructed to connect with Los Angeles (6,400 MW) and Phoenix (700 MW), so that the 915-MW output of the Dry Lake SEZ could be fully utilized. This scheme has four segments. The first segment extends northwesterly from the SEZ to the first switching station over a distance of about 0.5 mi (0.8 km). This segment would require a single-circuit 500-kV (1-500 kV) bundle of three conductors (Bof3) transmission line design. The second leg runs about 30 mi (48 km) from the first switching station to the Las Vegas switching station, while the third leg extends from the Las Vegas switching station about 280 mi (451 km) to Los Angeles (6,400 MW). The fourth and final segment runs from the Las Vegas Switching Station to Phoenix (700 MW) for a distance of 294 mi (473 km).

Table 11.3.23.2-1 summarizes the distances to the various load areas over which new transmission lines would need to be constructed, as well as the assumed number of substations that would be required. One substation is assumed to be installed at each load area and an additional one at the SEZ. In general, the total number of substations per scheme is simply equal to the number of load areas associated with the scheme plus one. Substations at the load areas would consist of one or more step-down transformers, while the originating substation at the SEZ would consist of several step-up transformers. The originating substation would have a rating of at least 915 MW (to match the plant's output), while the combined load substations would have a similar total rating of 915 MW. For schemes that require the branching of the lines, a switching substation is assumed to be constructed at the appropriate junction. In general, switching stations carry no local load but are assumed to be equipped with switching gears (e.g., circuit breakers and connecting switches) to reroute power as well as, in some cases, with additional equipment is installed to regulate voltage.

Table 11.3.23.2-2 provides an estimate of the total land area disturbed for construction of new transmission facilities under each of the schemes evaluated. The most favorable

TABLE 11.3.23.2-1 Potential Transmission Schemes, Estimated Solar Markets, and Distances to Load Areas for the Proposed Dry Lake SEZ

Transmission Scheme	City/Load Area Name	Estimated Peak Solar Market (MW)[c]	Total Solar Market (MW)	Sequential Distance (mi)[d]	Total Distance (mi)[d]	Line Voltage (kV)	No. of Substations
1	Las Vegas, Nevada[a]	975	975	30.5	31	345	3
2	Los Angeles, California[a]	6,400	7,100	280	605	500,	5
	Phoenix, Arizona[b]	700		324.5		138	

[a] The load area represents the metropolitan area (i.e., the identified city plus adjacent communities).

[b] The load area represents the city named.

[c] From Table 11.3.23.1-1.

[d] To convert mi to km, multiply by 1.6093.

TABLE 11.3.23.2-2 Comparison of the Various Transmission Line Configurations with Respect to Land Use Requirements for the Proposed Dry Lake SEZ

Transmission Scheme	City/Load Area Name	Total Distance (mi)[c]	No. of Substations	Land Use (acres)[d]		
				Transmission Line	Substation	Total
1	Las Vegas, Nevada[a]	30.5	3	647.0	22.0	669.0
2	Los Angeles, California[a]	311	5	2,850.9	22.0	2,872.9
	Phoenix, Arizona[b]	294				

[a] The load area represents the metropolitan area (i.e., the identified city plus adjacent communities).

[b] The load area represents the city named.

[c] To convert mi to km, multiply by 1.6093.

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

transmission scheme with respect to minimizing costs and the area disturbed would be scheme 1, which would serve Las Vegas. This scheme is estimated to potentially disturb about 669 acres (2.7 km^2) of land. The less favorable transmission scheme with respect to minimizing costs and the area disturbed would be scheme 2 (serving Los Angeles and Phoenix, but excluding Las Vegas). For this scheme, the construction of new transmission lines and substations is estimated to disturb a land area on the order of 2,873 acres (11.6 km^2).

Table 11.3.23.2-3 shows the estimated NPV of both transmission schemes and takes into account the cost of constructing the lines, the substations, and the projected revenue stream over

TABLE 11.3.23.2-3 Comparison of Potential Transmission Lines with Respect to NPV (Base Case) for the Proposed Dry Lake SEZ

Transmission Scheme	City/Load Area Name	Present Value Transmission Line Cost ($ million)	Present Value Substation Cost ($ million)	Annual Sales Revenue ($ million)	Present Worth of Revenue Stream ($ million)	NPV ($ million)
1	Las Vegas, Nevada[a]	67.1	60.4	160.3	1,237.9	1,110.4
2	Los Angeles, California[a] Phoenix, Arizona[b]	1,311.3	60.4	160.3	1,237.9	–133.0

[a] The load area represents the metropolitan area (i.e., the identified city plus adjacent communities).

[b] The load area represents the city named.

the 10-year horizon. A positive NPV indicates that revenues more than offset investments. This calculation does not include the cost of producing electricity.

The most economically attractive configuration (transmission scheme 1) has the highest positive NPV and has Las Vegas. The secondary case (transmission scheme 2), which excludes the Las Vegas market, is less economically attractive. For the assumed utilization factor of 20%, scheme 2 exhibits a negative NPV, implying that this option may not be economically viable under the current assumptions.

Table 11.3.23.2-4 shows the effect of varying the value of the utilization factor on the NPV of the transmission schemes. The table shows that at about 30% utilization, NPVs for both schemes are positive. It also shows that as the utilization factor is increased, the economic

TABLE 11.3.23.2-4 Effect of Varying the Utilization Factor on the NPV of the Transmission Schemes for the Proposed Dry Lake SEZ

Transmission Scheme	City/Load Area Name	NPV ($ million) at Different Utilization Factors					
		20%	30%	40%	50%	60%	70%
1	Las Vegas, Nevada[a]	1,110	1,729	2,348	2,967	3,586	4,205
2	Los Angeles, California[a] Phoenix, Arizona[b]	–134	485	1,104	1,723	2,342	2,961

[a] The load area represents the metropolitan area (i.e., the identified city plus adjacent communities).

[b] The load area represents the city named.

viability of the lines increases. Utilization factors can be raised by allowing the new dedicated lines to market other power generation outputs in the region in addition to that of its associated SEZ.

The findings of the DLT analysis for the proposed Dry Lake SEZ are as follows:

- Transmission scheme 1, which identifies Las Vegas as the primary market, represents the most favorable option based on NPV and land use requirements. This configuration would result in new land disturbance of about 669 acres (2.7 km^2).

- Transmission scheme 2, which represents an alternative configuration if Las Vegas is excluded, serves Los Angeles and Phoenix. This configuration would result in new land disturbance of about 2,873 acres (11.6 km^2).

- Other load area configurations are possible but would be less favorable than scheme 1 in terms of NPV and, in most cases, also in terms of land use requirements. If new electricity generation at the proposed Dry Lake SEZ is not sent to either of the two markets identified above, the potential upper-bound impacts in terms of cost would be greater.

- The analysis of transmission requirements for the proposed Dry Lake SEZ indicates no reduction of impacts from increasing the solar-eligible load assumption for transmission scheme 1, which brings power to Las Vegas. Increasing the solar-eligible percentage would have no effect, because an adequate load area was identified under the 20% assumption that would accommodate all of the SEZ's capacity. Thus, line distances and voltages would not be affected by increasing the solar-eligible load assumption, and similarly the associated costs and land disturbance would not be affected. However, for transmission scheme 2, which serves Los Angeles and Phoenix, increasing the solar-eligible load assumption could result in lower cost and land disturbance estimates, because it is possible that fewer load areas would be needed to accommodate the SEZ's capacity.

11.3.24 Impacts of the Withdrawal

The BLM is proposing to withdraw 6,186 acres (25 km^2) of public land comprising the proposed Dry Lake SEZ from settlement, sale, location, or entry under the general land laws, including the mining laws, for a period of 20 years (see Section 2.2.2.2.4 of the Final Solar PEIS). 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. This means that the lands could not be appropriated, sold, or exchanged during the term of the withdrawal and new mining claims could not be filed on the withdrawn lands. Mining claims filed prior to the segregation or withdrawal of the identified lands would take precedence over future solar energy development. The withdrawn lands would remain open to the mineral leasing, geothermal

leasing, and mineral material laws, and 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, contained in the withdrawn lands. In addition, the BLM would retain the discretion to authorize linear and renewable energy ROWs on the withdrawn lands.

The purpose of the proposed land withdrawal is to minimize the potential for conflicts between mineral development and solar energy development for the proposed 20-year withdrawal period. Under the land withdrawal, only mining claims recorded before the current segregation could be developed, if valid. Because the Dry Lake SEZ has 23 active claims, it is possible that some mining-related surface development could occur at the site during the withdrawal period and preclude use of at least a portion of the SEZ for solar energy development. Mining-related surface development includes activities such as the establishment of open pit mining, construction of roads for hauling materials, extraction of ores from tunnels or adits, or construction of facilities to process the material mined.

For the Dry Lake SEZ, impacts of the proposed withdrawal on mineral resources and related economic activity and employment are expected to be negligible to minor. Although the area contains a number of active lode and placer claims (and several closed lode and placer claims), there has been no known production from the lands within the SEZ (BLM 2012a). Since the claims were filed prior to the temporary segregation, they would take precedence over future solar energy development if found to be valid. The lands within the SEZ would remain open to mineral leasing, geothermal leasing, and mineral materials laws. Therefore, the BLM could still elect to lease oil, gas, coal, or geothermal resources or to sell common-variety mineral materials, such as sand and gravel, at its discretion. The lands would also remain open to ROW authorizations.

Although the mineral potential of the lands within the Dry Lake SEZ is low, the proposed withdrawal of lands within the SEZ would preclude many types of mining activity over a 20-year period, resulting in the avoidance of potential mining-related adverse impacts. Impacts commonly related to mining development include increased soil erosion and sedimentation, water use, generation of contaminated water in need of treatment, creation of lagoons and ponds (hazardous to wildlife), toxic runoff, air pollution, establishment of noxious weeds and invasive species, habitat destruction or fragmentation, disturbance of wildlife, blockage of migration corridors, increased visual contrast, noise, destruction of cultural artifacts and fossils and/or their context, disruption of landscapes and sacred places of interest to tribes, increased traffic and related emissions, and conflicts with other land uses (e.g., recreational).

11.3.25 References

Note to Reader: This list of references identifies Web pages and associated URLs where reference data were obtained for the analyses presented in this Final Solar PEIS. It is likely that at the time of publication of this Final Solar PEIS, some of these Web pages may no longer be available or their URL addresses may have changed. The original information has been retained and is available through the Public Information Docket for this Final Solar PEIS.

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11.3.26 Errata for the Proposed Dry Lake SEZ

This section presents corrections to material presented in the Draft Solar PEIS and the Supplement to the Draft. The need for these corrections was identified in several ways: through comments received on the Draft Solar PEIS and the Supplement to the Draft (and verified by the authors), through new information obtained by the authors subsequent to publication of the Draft Solar PEIS and the Supplement to the Draft, or through additional review of the original material by the authors. Table 11.3.26-1 provides corrections to information presented in the Draft Solar PEIS and the Supplement to the Draft.

TABLE 11.3.26-1 Errata for the Proposed Dry Lake SEZ (Section 11.3 of the Draft Solar PEIS and Section C.4.2 of the Supplement to the Draft Solar PEIS)

Section No.	Page No.	Line No.	Figure No.	Table No.	Correction
11.3.7.1.2	11.3-45		11.3.7.1-5		The soil map presented in the Draft Solar PEIS for the Dry Lake SEZ erroneously showed the Dry Lake Valley North SEZ; the correct soil map can be found in Section 11.3.7.1.2 of this Final Solar PEIS as Figure 11.3.7.1-1.
11.3.9.1.3	11.3-57	13–15			"The Southern Nevada Water Authority (SNWA 2009) stated that the Las Vegas Valley Water District has leased the majority of their 2,200 ac-ft/yr (2.7 million m^3/yr) of groundwater rights in Garnet Valley to dry-cooled power plants in the area," should read, "The Southern Nevada Water Authority (SNWA 2009) stated that the Las Vegas Valley Water District has leased the majority of their combined 2,200 ac-ft/yr (2.7 million m^3/yr) of groundwater rights in Garnet Valley and Hidden Valley to dry-cooled power plants in the area."
11.3.11.2					All uses of the term "neotropical migrants" in the text and tables of this section should be replaced with the term "passerines."
11.3.22.2.2	11.3-344	27			"and western Utah" should be removed from the following statement: ***Clark, Lincoln, and White Pine Counties Groundwater Development Project.*** The Southern Nevada Water Authority (SNWA) proposes to construct a groundwater development project that would transport approximately 122,755 ac-ft/yr (151 million m^3/yr) of groundwater under existing water rights and applications from several hydrographic basins in eastern Nevada and western Utah.

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