11.6 GOLD POINT

11.6.1 Background and Summary of Impacts

11.6.1.1 General Information

The proposed Gold Point SEZ is located in Esmeralda County in southwestern Nevada (Figure 11.6.1.1-1). The SEZ has a total area of 4,810 acres (19 km^2). In 2008, the county population was 664, while adjacent Nye County to the east had a population of 44,175. There are no incorporated towns in close proximity to the SEZ. The town of Tonopah is approximately 50 mi (80 km) to the north, and the Las Vegas metropolitan area is approximately 180 mi (290 km) to the southeast of the SEZ.

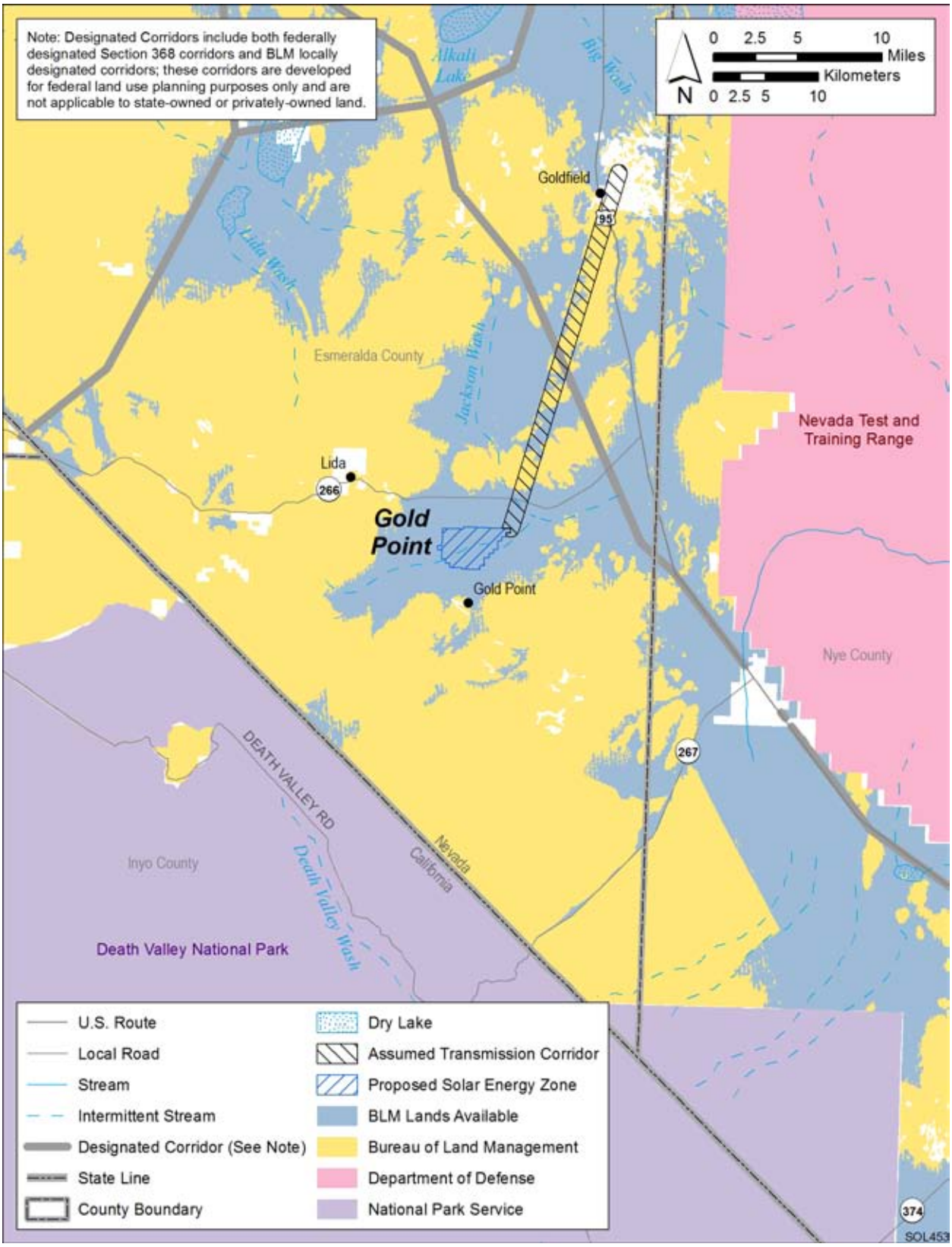
The nearest major road access to the proposed Gold Point SEZ is State Route 774, which parallels the eastern edge of the SEZ; U.S. 95 runs north–south as it passes within 9 mi (14 km) to the east of the SEZ. The UP Railroad serves the region; the closest stop is in Thorne, 160 mi (257 km) northwest of the SEZ. The nearest public airport is Lida Junction Airport, a small BLM airport about 10 mi (16 km) from the SEZ. There are three additional airports in the vicinity, none of which have scheduled commercial passenger service. The nearest airport with scheduled passenger service is in Las Vegas, Nevada.

A 120-kV transmission line passes 22 mi (35 km) west of the SEZ. It is assumed that a new transmission line would be needed to provide access from the SEZ to the transmission grid (see Section 11.6.1.2).

Applications for ROWs that have been submitted to the BLM include one pending solar project, one pending authorization for wind site testing, two authorized projects for wind site testing, and one authorized geothermal project that would be located within 50 mi (80 km) of the Gold Point SEZ. These applications are discussed in Section 11.6.22.2.1.

The proposed Gold Point SEZ is in an undeveloped rural area. The SEZ is located in the Lida Valley, which lies between the Mount Jackson Ridge and Cuprite Hills to the north and Slate Ridge to the south. It is bounded on the west by the Palmetto Mountains and on the east by the Stonewell Mountains.

The proposed Gold Point SEZ and other relevant information are shown in Figure 11.6.1.1-1. The criteria used to identify the SEZ as an appropriate location for solar energy development included proximity to existing transmission lines or designated corridors, proximity to existing roads, a slope of generally less than 2%, and an area of more than 2,500 acres (10 km^2). In addition, the area was identified as being relatively free of other types of conflicts, such as USFWS-designated critical habitat for threatened and endangered species, ACECs, SRMAs, and NLCS lands (see Section 2.2.2.2 for the complete list of exclusions). Although these classes of restricted lands were excluded from the proposed Gold Point SEZ, other restrictions might be appropriate. The analyses in the following sections address the



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2 **FIGURE 11.6.1.1-1 Proposed Gold Point SEZ**

affected environment and potential impacts associated with utility-scale solar energy development in the proposed SEZ for important environmental, cultural, and socioeconomic resources.

As initially announced in the *Federal Register* on June 30, 2009, the proposed Gold Point SEZ encompassed 5,830 acres (24 km^2). Subsequent to the study area scoping period, the boundaries of the proposed Gold Point SEZ were altered somewhat to facilitate the BLM's administration of the SEZ area. Borders with irregularly shaped boundaries were adjusted to match the section boundaries of the Public Lands Survey System (PLSS) (BLM and USFS 2010c). The revised SEZ is approximately 1,020 acres (4 km^2) smaller than the original SEZ area as published in June 2009.

11.6.1.2 Development Assumptions for the Impact Analysis

Maximum solar development of the Gold Point SEZ is assumed to be 80% of the SEZ area over a period of 20 years, a maximum of 3,848 acres (16 km^2). These values are shown in Table 11.6.1.2-1, along with other development assumptions. Full development of the Gold Point SEZ would allow development of facilities with an estimated total of 428 MW of electrical power capacity if power tower, dish engine, or PV technologies were used, assuming 9 acres/MW (0.04 km^2/MW) of land required, and an estimated 770 MW of power if solar trough technologies were used, assuming 5 acres/MW (0.02 km^2/MW) of land required.

Availability of transmission from SEZs to load centers will be an important consideration for future development in SEZs. The nearest existing transmission line is a 120-kV line 22 mi (35 km) west of the SEZ. It is possible that a new transmission line could be constructed from the SEZ to this existing line, but the 120-kV capacity of that line would be inadequate for 428 to 770 MW of new capacity (note that a 500 kV line can accommodate approximately the load of one 700-MW facility). At full build-out capacity, new transmission and/or upgrades of existing transmission lines (in addition to or instead of construction of a connection to the nearest existing line) might be required to bring electricity from the proposed Gold Point SEZ to load centers; however, at this time the location and size of such new transmission facilities are unknown. Generic impacts of transmission and associated infrastructure construction and of line upgrades for various resources are discussed in Chapter 5. Project-specific analyses would need to identify the specific impacts of new transmission construction and line upgrades for any projects proposed within the SEZ.

For purposes of as complete an analysis of impacts of development in the SEZ as possible, it was assumed that, at a minimum, a transmission line segment would be constructed from the proposed Gold Point SEZ to the nearest existing transmission line to connect the SEZ to the transmission grid. This assumption was made without additional information on whether the nearest existing transmission line would actually be available for connection of future solar

TABLE 11.6.1.2-1 Proposed Gold Point SEZ—Assumed Development Acreages, Solar MW Output, Access Roads, and Transmission Line ROWs

Total 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 Transmission Line and Road ROWs	Distance to Nearest Designated Corridor[e]
4,810 acres and 3,848 acres[a]	428 MW[b] and 770 MW[c]	State Route 774 0 mi	22 mi[d] and 120 kV	667 acres and 0 acres	6 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 1.609.

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

facilities, and without assumptions about upgrades of the line. Establishing a connection to the line closest to the SEZ would involve the construction of about 22 mi (35 km) of new transmission line outside of the SEZ. The ROW for this transmission line would occupy approximately 667 acres (2.7 km^2) of land, assuming a 250-ft (76-m) wide ROW, a typical width for such a ROW. If a connecting transmission line were constructed to a different offsite grid location in the future, site developers would need to determine the impacts from construction and operation of that line. In addition, developers would need to determine the impacts of line upgrades if they were needed.

Existing road access to the proposed Gold Point SEZ should be adequate to support construction and operation of solar facilities, because State Route 774 runs along the eastern border of the SEZ. Thus, no additional road construction outside of the SEZ is assumed to be required to support solar development, as summarized in Table 11.6.1.2-1.

11.6.1.3 Summary of Major Impacts and SEZ-Specific Design Features

In this section, the impacts and SEZ-specific design features assessed in Sections 11.6.2 through 11.6.21 for the proposed Gold Point SEZ are summarized in tabular form. Table 11.6.1.3-1 is a comprehensive list of impacts discussed in these sections; the reader may reference the applicable sections for detailed support of the impact assessment. Section 11.6.22 discusses potential cumulative impacts from solar energy development in the proposed SEZ.

TABLE 11.6.1.3-1 Summary of Impacts of Solar Energy Development within the Proposed Gold Point SEZ and SEZ-Specific Design Features

Resource Area	Environmental Impacts—Proposed Gold Point SEZ	SEZ-Specific Design Features
Lands and Realty	Full development of the proposed Gold Point SEZ could disturb up to 3,848 acres (15.6 km^2). Development of the SEZ for utility-scale solar energy production would establish an isolated industrial area that would exclude many existing and potential uses of the land, perhaps in perpetuity.	None.
Specially Designated Areas and Lands with Wilderness Characteristics	Light from solar facilities could adversely affect night sky viewing in some specially designated areas. New transmission lines could cause visual impacts on specially designated areas.	None. Transmission line construction should be routed and constructed in such a way as to minimize visual impacts on specially designated areas.
Rangeland Resources: Livestock Grazing	None.	None.
Rangeland Resources: Wild Horses and Burros	Wild horses and burros in the Gold Mountain HMA could incur indirect impacts from solar energy development. Wild horses and burros would incur direct and indirect impacts from construction of the assumed transmission line in the Goldfield HMA. Direct impacts would be small as only 0.07% of the HMA would be impacted by construction. Following construction, wild horses and burros would be able to make use of the rangelands within the transmission line ROW.	None.
Recreation	Recreational use would be eliminated from portions of the SEZ that would be developed for solar energy production; the loss of use, however, is anticipated to be minimal. There are no anticipated adverse effects on recreation use of specially designated areas within 25 mi (40 km) of the SEZ.	None.

TABLE 11.6.1.3-1 (Cont.)

Resource Area	Environmental Impacts—Proposed Gold Point SEZ	SEZ-Specific Design Features
Military and Civilian Aviation	*Military*: The military has expressed serious concern over solar energy facilities being constructed within the SEZ. Nellis Air Force Base has indicated that solar technologies could interfere with flight operations on MTRs that cross the SEZ. The NTTR has indicated that structures higher than 50 ft (15 m) above ground level may present unacceptable electromagnetic compatibility concerns for the NTTR test mission.	None.
	Civilian: There would be no effect on civilian aviation.	None.
Geologic Setting and Soil Resources	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. Impacts would include soil compaction, soil horizon mixing, soil erosion and deposition by wind, soil erosion by water and surface runoff, sedimentation, and soil contamination. These impacts may be impacting factors for other resources (e.g., air quality, water quality, and vegetation).	None.
Minerals (fluids, solids, and geothermal resources)	None.	None.
Water Resources	Ground-disturbance activities (affecting 62% of the total area in the peak construction year) could affect surface water quality due to surface runoff, sediment erosion, and contaminant spills.	Water resource analysis indicates that wet-cooling options would not be feasible; other technologies should incorporate water conservation measures.
	Construction activities may require up to 1,707 ac-ft (2.1 million m^3) of water during the peak construction year.	Land disturbance activities should minimize impacts to the unnamed intermittent stream, the playa area in the northeast corner, and ephemeral washes on site.
	Construction activities would generate as high as 74 ac-ft (91,300 m^3) of sanitary wastewater.	

TABLE 11.6.1.3-1 (Cont.)

Resource Area	Environmental Impacts—Proposed Gold Point SEZ	SEZ-Specific Design Features
Water Resources *(Cont.)*	Assuming full development of the SEZ, operations would use the following amounts of water: • For parabolic trough facilities (770-MW capacity), 550 to 1,166 ac-ft/yr (678,400 to 1.4 million m^3/yr) for dry-cooled systems; water requirements for wet-cooled systems are more than 10 times the perennial yield of the basin. • For power tower facilities (428-MW capacity), 305 to 647 ac-ft/yr (376,200 to 798,000 m^3/yr) for dry-cooled systems; water requirements for wet-cooled systems are more than 6 times the perennial yield of the basin. • For dish engine facilities (428-MW capacity), 219 ac-ft/yr (270,100 m^3/yr). • For PV facilities (428-MW capacity), 22 ac-ft/yr (27,100 m^3/yr). Assuming full development of the SEZ, operations would generate up to 11 ac-ft/yr (13,600 m^3/yr) of sanitary wastewater and up to 219 ac-ft/yr (270,100 m^3/yr) of blowdown water.	Siting of solar facilities and construction activities should avoid any areas identified as within a 100-year floodplain or jurisdictional waters. Groundwater supplies during the construction and operations phases would need to be secured through coordination of the NDWR in terms of obtaining groundwater rights with in the Lida Valley groundwater basin, and potentially from off-site sources and adjacent groundwater basins for the construction phase. Stormwater management plans and BMPs should comply with standards developed by the Nevada Division of Environmental Protection. Groundwater monitoring and production wells should be constructed in accordance with state standards. Water for potable uses would have to meet or be treated to meet water quality standards in accordance with the *Nevada Administrative Code*.

TABLE 11.6.1.3-1 (Cont.)

Resource Area	Environmental Impacts—Proposed Gold Point SEZ	SEZ-Specific Design Features
Vegetation[b]	Up to 80% of the SEZ (3,848 acres [15.6 km^2]) would be cleared of vegetation; re-establishment of desert scrub communities in temporarily disturbed areas would likely be very difficult because of the arid conditions and might require extended periods of time. Noxious weeds could become established in disturbed areas and colonize adjacent undisturbed habitats, thus reducing restoration success and potentially resulting in widespread habitat degradation. The deposition of fugitive dust from large areas of disturbed soil onto habitats outside a solar project area could result in reduced productivity or changes in plant community composition. Vegetation communities associated with playa habitats, greasewood flats, riparian habitats, desert dry washes, or other intermittently flooded areas within or downgradient from solar projects could be affected by ground-disturbing activities. The use of groundwater within the proposed Gold Point SEZ for technologies with high water requirements, such as wet-cooling systems, could disrupt the groundwater flow pattern and adversely affect habitats associated with springs in the vicinity of the SEZ.	An Integrated Vegetation Management Plan, addressing invasive species control, and an Ecological Resources Mitigation and Monitoring Plan, addressing habitat restoration, should be approved and implemented to increase the potential for successful restoration of desert scrub, greasewood flat, and other affected habitats, and to minimize the potential for the spread of invasive species. Invasive species control should focus on biological and mechanical methods where possible to reduce the use of herbicides. All riparian, dry wash, and playa communities within the SEZ and transmission line corridor should be avoided to the extent practicable, and any impacts minimized and mitigated. Any Joshua tree or other *Yucca* species, cacti, or succulent plant species that cannot be avoided should be salvaged. A buffer area should be maintained around dry wash, riparian, and playa habitats to reduce the potential for impacts. Appropriate engineering controls should be used to minimize impacts on dry wash, playa, wetland, greasewood flat, and riparian habitats, including downstream occurrences, resulting from surface water runoff, erosion, sedimentation, altered hydrology, accidental spills, or fugitive dust deposition to these habitats. Appropriate buffers and engineering controls would be determined through agency consultation.

TABLE 11.6.1.3-1 (Cont.)

Resource Area	Environmental Impacts—Proposed Gold Point SEZ	SEZ-Specific Design Features
Vegetation *(Cont.)*		Groundwater withdrawals should be limited to reduce the potential for indirect impacts on habitats associated with springs. Potential impacts on springs should be determined through hydrological studies.
Wildlife: Amphibians and Reptiles[b]	Direct impacts on all representative amphibian and reptile species would be small (i.e., loss of 0.1% or less of potentially suitable habitats within the SEZ region). With the implementation of design features, indirect impacts would be expected to be negligible.	Development in wash and playa habitats should be avoided.
Wildlife: Birds[b]	Direct impacts on all representative bird species would be small (i.e., loss of 0.2% or less of potentially suitable habitats within the SEZ region). Other impacts on birds could result from collision with vehicles and infrastructure (e.g., buildings and fences), surface water and sediment runoff from disturbed areas, fugitive dust generated by project activities, noise, lighting, spread of invasive species, accidental spills, and harassment.	The requirements contained within the 2010 Memorandum of Understanding between the BLM and USFWS to promote the conservation of migratory birds will be followed. Take of golden eagles and other raptors should be avoided. Mitigation regarding the golden eagle should be developed in consultation with the USFWS and the NDOW. A permit may be required under the Bald and Golden Eagle Protection Act. Wash and playa habitats should be avoided.
Wildlife: Mammals[b]	Direct impacts on all representative mammal species would be small (i.e., loss of 0.1% or less of potentially suitable habitats within the SEZ region). Other impacts on mammals could result from collision with vehicles and infrastructure (e.g., fences), surface water and sediment runoff from disturbed areas, fugitive dust generated by project activities, noise, lighting, spread of invasive species, accidental spills, and harassment. These impacts are expected to be negligible with the implementation of design features.	The fencing around the solar energy development should not block the free movement of mammals, particularly big game species. Wash and playa habitats should be avoided.

TABLE 11.6.1.3-1 (Cont.)

Resource Area	Environmental Impacts—Proposed Gold Point SEZ	SEZ-Specific Design Features
Aquatic Biota[b]	There are no permanent water bodies, streams, or wetlands present within the area of direct or indirect effects of either the proposed Gold Point SEZ or the presumed new transmission line corridor. Intermittent and ephemeral streams are present in the area of direct and indirect effects, and ground disturbance could increase the transport of soil into these streams via waterborne and airborne pathways. In addition, contaminants such as fuels, lubricants, or pesticides/herbicides could enter intermittent streams near construction activities. However, these streams are not expected to contain aquatic habitat or biota and do not connect to perennial surface waters. Therefore, no impacts on aquatic habitat or biota are expected.	None.
Special Status Species[b]	Potentially suitable habitat for 21 special status species occurs in the affected area of the Gold Point SEZ. For most special status species, less than 1% of the potentially suitable habitat in the region occurs in the area of direct effects.	Pre-disturbance surveys should be conducted within the area of direct effects to determine the presence and abundance of special status species. Disturbance to occupied habitats for these species should be avoided or minimized to the extent practicable. If avoiding or minimizing impacts on occupied habitats is not possible for some species, translocation of individuals from areas of direct effects or compensatory mitigation of direct effects on occupied habitats could reduce impacts. A comprehensive mitigation strategy for special status species that uses one or more of these options to offset the impacts of development should be developed in coordination with the appropriate federal and state agencies. Avoiding or minimizing disturbance to desert wash, playa, and sagebrush habitats could reduce or eliminate impacts on two special status species.

TABLE 11.6.1.3-1 (Cont.)

Resource Area	Environmental Impacts—Proposed Gold Point SEZ	SEZ-Specific Design Features
Special Status Species[b] *(Cont.)*		Coordination with the USFWS and the NDOW should be conducted for the greater sage-grouse—a candidate species for listing under the ESA. Coordination would identify an appropriate survey protocol and mitigation requirements, which may include avoidance, minimization, translocation, or compensation. Harassment or disturbance of special status species and their habitats in the affected area should be avoided or minimized. This can be accomplished by identifying any additional sensitive areas and implementing necessary protection measures based upon consultation with the USFWS and NDOW.
Air Quality and Climate	*Construction*: Temporary exceedances of AAQS for 24-hour and annual PM_{10} and 24-hour $PM_{2.5}$ concentration levels at the SEZ boundaries and in the immediate surrounding areas during the construction of solar facilities. These concentrations would decrease quickly with distance. Modeling indicates that emissions from construction activities are not anticipated to exceed Class I PSD PM_{10} increments at the nearest federal Class I area (John Muir WA, California). In addition, construction emissions from the engine exhaust of heavy equipment and vehicles could affect AQRVs (e.g., visibility and acid deposition) at nearby federal Class I areas. *Operations*: Positive impact due to avoided emissions of air pollutants from combustion-related power generation: 2.0 to 3.6% of total emissions of SO_2, NO_x, Hg, and CO_2 from electric power systems in the state of Nevada (up to 1,902 tons/yr SO_2, 1,632 tons/yr NO_x, 0.011 ton/yr Hg, and 1,047,000 tons/yr CO_2).	None.

TABLE 11.6.1.3-1 (Cont.)

Resource Area	Environmental Impacts—Proposed Gold Point SEZ	SEZ-Specific Design Features
Visual Resources	The SEZ is in an area of low scenic quality, but with few cultural disturbances already present. Residents, workers, and visitors to the area may experience visual impacts from solar energy facilities located within the SEZ (as well as any associated access roads and transmission lines) as they travel area roads. Solar development could produce large visual impacts on the SEZ and surrounding lands within the SEZ viewshed due to major modification of the character of the existing landscape. The SEZ is located 7.0 mi (13.5 km) from Queer Mountain WSA. Because of the elevated viewpoints in the WSA, moderate visual contrasts could be observed by WSA visitors. The SEZ is located 5.0 mi (8 km) from Magruder Mountain. Because of the close proximity and elevated viewpoints on Magruder Mountain, moderate visual contrasts could be observed by viewers on the mountain. Approximately 18 mi (29 km) of State Route 266 are within the SEZ viewshed. Because State Route 266 passes with 2 mi (3 km) of the SEZ, strong visual contrasts would be expected for nearby viewpoints on this highway. The community of Gold Point is located less than 2 mi (3 km) from the SEZ, although slight variations in topography and buildings could provide limited screening. Because of the close proximity of the SEZ to Gold Point, strong visual contrasts would be expected for viewpoints within the community of Gold Point.	None.

TABLE 11.6.1.3-1 (Cont.)

Resource Area	Environmental Impacts—Proposed Gold Point SEZ	SEZ-Specific Design Features
Acoustic Environment	*Construction:* For construction of a solar facility located near the southern SEZ boundary, estimated noise levels at the nearest residences located about 2 mi (3 km) from the SEZ boundary would be about 34 dBA, which is below the typical daytime mean rural background level of 40 dBA. In addition, an estimated 40 dBA L_{dn} at these residences (i.e., no contribution from construction activities) is well below the EPA guidance of 55 dBA L_{dn} for residential areas. *Operations:* For operation of a parabolic trough or power tower facility located near the southern SEZ boundary, the predicted noise level would be about 36 dBA at the nearest residences, which is below the typical daytime mean rural background level of 40 dBA. If the operation were limited to daytime, 12 hours only, a noise level of about 41 dBA L_{dn} (i.e., minimal contribution from facility operation) would be estimated for the nearest residences, which is well below the EPA guideline of 55 dBA L_{dn} for residential areas. However, in the case of 6-hour TES, the estimated noise level at the nearest residences would be 46 dBA, which is well above the typical nighttime mean rural background level of 30 dBA. The day-night average noise level is estimated to be about 48 dBA L_{dn}, which is below the EPA guideline of 55 dBA L_{dn} for residential areas. If 80% of the SEZ were developed with dish engine facilities, the estimated noise level at the nearest residences would be about 43 dBA, which is somewhat higher than the typical daytime mean rural background level of 40 dBA. On the basis of 12-hour daytime operation, the estimated 43 dBA L_{dn} at these residences would be well below the EPA guideline of 55 dBA L_{dn} for residential areas.	Noise levels from cooling systems equipped with TES should be managed so that levels at the nearby residences to the south of the SEZ are kept within applicable guidelines. This could be accomplished in several ways, for example, through placing the power block approximately 1 to 2 mi (1.6 to 3 km) or more from residences, limiting operations to a few hours after sunset, and/or installing fan silencers. Dish engine facilities within the Gold Point SEZ should be located more than 1 to 2 mi (1.6 to 3 km) from the nearby residences. Direct noise control measures applied to individual dish engine systems could also be used to reduce noise impacts at nearby residences.

TABLE 11.6.1.3-1 (Cont.)

Resource Area	Environmental Impacts—Proposed Gold Point SEZ	SEZ-Specific Design Features
Paleontological Resources	Few, if any, impacts on significant paleontological resources are likely in the proposed Gold Point SEZ. However, a more detailed look at the geological deposits of the SEZ is needed to determine whether a paleontological survey is warranted. The potential for impacts on significant paleontological resources in portions of the transmission line corridor is unknown. A paleontological survey may be needed prior to project approval.	The need for and nature of SEZ-specific design features would depend on the results of future paleontological investigations, especially along a potential new transmission corridor.
Cultural Resources	Direct impacts on significant cultural resources could occur in the proposed Gold Point SEZ; however, further investigation is needed. Sites related to historic mining in the region are possible. Visual impacts on the Gold Point Town Site are also likely. A cultural resource survey of the entire area of potential effect, including consultation with affected Native American Tribes, would first need to be conducted to identify archaeological sites, historic structures and features, and traditional cultural properties, and an evaluation would need to follow to determine whether any are eligible for listing in the NRHP. Impacts on several sites are possible along the transmission line route, depending on the specific location of the line. Visual impacts along the transmission corridor are also possible, potentially affecting the Goldfield Historic District.	SEZ-specific design features would be determined through consultation with the Nevada SHPO and affected Tribes and would depend on the results of future cultural investigations. General visual mitigation measures may need to be employed to reduce visual impacts on the Gold Point Town Site near the SEZ and along the possible transmission line near the Goldfield Historic District.
Native American Concerns	While no comments specific to the proposed Gold Point SEZ have been received from Native American Tribes to date, as consultation with the Tribes continues and project-specific analyses are undertaken, it is possible that Native Americans will express concern over potential visual and other effects of solar energy development within the SEZ on specific resources, including culturally important landscapes.	The need for and nature of SEZ-specific design features would be determined during government-to-government consultation with the affected Tribes.

TABLE 11.6.1.3-1 (Cont.)

Resource Area	Environmental Impacts—Proposed Gold Point SEZ	SEZ-Specific Design Features
Socioeconomics	*Construction:* A total 173 to 2,287 jobs would be added; ROI income would increase by $10.5 million to $138.9 million. *Operations:* A total of 10 to 224 annual jobs would be added; ROI income would increase by $0.3 million to $7.6 million. Construction of new transmission line: 79 jobs; $3.7 million income in ROI.	None.
Environmental Justice	As defined in CEQ guidelines, no minority or low-income populations occur within the 50-mi (80-km) radius around the boundary of the SEZ; thus, there would be no disproportionately high and adverse human health or environmental effects on low-income or minority populations.	None.
Transportation	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 increase in the volume of traffic on U.S. 95, State Route 266, and State Route 774 would represent an increase in traffic of about 100%, 1,000%, and 10,000%, respectively. Traffic on U.S. 95 could experience slowdowns, and local road improvements would be necessary on State Route 266 and on State Route 774.	None.

Abbreviations: AAQS = ambient air quality standards; ACEC = Area of Critical Environmental Concern; AQRV = air quality–related value; BLM = Bureau of Land Management; BMP = best management practice; CEQ = Council on Environmental Quality; CO_2 = carbon dioxide; dBA = A-weighted decibel; EPA = U.S. Environmental Protection Agency; ESA = Endangered Species Act; Hg = mercury; L_{dn} = day-night average sound level; MTR = military training route; NDOW = Nevada Department of Wildlife; NDWR = Nevada Division of Water Resources; NNHP = Nevada Natural Heritage Program; NO_x = nitrogen oxides; NP = National Park; NRHP = *National Register of Historic Places*; PEIS = programmatic environmental impact statement; $PM_{2.5}$ = particulate matter with an aerodynamic diameter of 2.5 μm or less; PM_{10} = particulate matter with an aerodynamic diameter of 10 μm or less; PSD = prevention of significant deterioration; PV = photovoltaic; ROI = region of influence; ROW = right-of-way; SEZ = solar energy zone; SHPO = State Historic Preservation Office; SO_2 = sulfur dioxide; SRMA = Special Recreation Management Area; TES = thermal energy storage; USFWS = U.S. Fish and Wildlife Service; WA = Wilderness Area.

Footnotes continued on next page.

TABLE 11.6.1.3-1 (Cont.)

[a] The detailed programmatic design features for each resource area to be required under BLM's Solar Energy Program are presented in Appendix A, Section A.2.2. These programmatic design features would be required for development in the proposed Gold Point SEZ.

[b] The scientific names of all plants, wildlife, aquatic biota, and special status species are provided in Sections 11.6.10 through 11.6.12.

Only those design features specific to the proposed Gold Point SEZ are included in Sections 11.6.2 through 11.6.21 and in the summary table. The detailed programmatic design features for each resource area to be required under BLM's Solar Energy Program are presented in Appendix A, Section A.2.2. These programmatic design features would also be required for development in this and other SEZs.

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11.6.2 Lands and Realty

11.6.2.1 Affected Environment

The proposed Gold Point SEZ is a small but well-blocked area of BLM-administered land that is isolated but accessible via U.S. 95 and connecting to State Routes 266 and 774. The latter highway is within 0.25 mi (0.4 km) of the eastern border of the SEZ. The SEZ is located about 180 mi (290 km) northwest from Las Vegas. The character of the land in the SEZ is undeveloped and rural with only a few dirt roads present within the area. There are no existing ROWs within the SEZ, but there is a designated 368b transmission corridor (of the Energy Policy Act of 2005) that passes about 6.5 mi (10 km) to the northeast of the area. There also is a proposed local corridor located just west of the 368b corridor.

As of February 2010, there were no ROW applications for solar energy facilities within the SEZ.

11.6.2.2 Impacts

11.6.2.2.1 Construction and Operations

Full development of the proposed Gold Point SEZ could disturb up to 3,848 acres (15.6 km^2) (Table 11.6.1.2-1). Development of the SEZ for utility-scale solar energy production would establish an industrial area that would exclude many existing and potential uses of the land, perhaps in perpetuity. Since the SEZ is undeveloped and isolated, utility-scale solar energy development would be a new and highly discordant land use to the area.

Should the proposed area be identified as a solar energy zone in the ROD for this PEIS, the BLM would still have discretion to authorize additional ROWs in the area until solar energy development was authorized, and then future ROWs would be subject to the rights issued for solar energy development. Because the proposed SEZ is surrounded by BLM-administered lands, approval of solar energy development of the SEZ would not have any impact on the availability of land for future ROWs in the area.

11.6.2.2.2 Transmission Facilities and Other Off-Site Infrastructure

An existing 120 kV transmission line runs 22 mi (35 km) northeast of the SEZ. It is assumed that a new transmission line segment would be constructed from the proposed Gold Point SEZ to the nearest existing transmission line to connect the SEZ to the transmission grid. Construction of the line would result in the disturbance of 667 acres (2.7 km^2) outside of the SEZ. If a connecting transmission line were constructed in a different location outside of the SEZ in the future, site developers would need to determine the impacts from construction and

operation of that line. In addition, developers would need to determine the impacts of line upgrades if they were needed.

State Route 774 is adjacent to the SEZ, and it is assumed that no new roads would be required to access the site.

Roads and transmission lines would be constructed within the SEZ as part of the development of the area.

11.6.2.3 SEZ-Specific Design Features and Design Feature Effectiveness

No SEZ-specific design features would be required. Implementing the programmatic design features described in Appendix A, Section A.2.2, as required under BLM's Solar Energy Program, would provide adequate mitigation for some identified impacts. The exceptions would be that the development of the SEZ would establish a large industrial area that would exclude many existing and potential uses of the land, perhaps in perpetuity and utility-scale solar energy development would be a new and discordant land use to the area.

11.6.3 Specially Designated Areas and Lands with Wilderness Characteristics

11.6.3.1 Affected Environment

There are 9 specially designated areas within 25 mi (40 km) of the proposed Gold Point SEZ that potentially could be affected by solar energy development within the SEZ, principally from impacts on scenic, recreation, and/or wilderness resources. The potential area of impact for the SEZ includes parts of Nevada and California. The specially designated areas that could be impacted from solar development within the SEZ include the following (see Figure 11.6.3.1-1):

- National Park
  - Death Valley
- National Conservation Area
  - California Desert
- Wilderness Areas
  - Death Valley
  - Piper Mountain
  - Sylvania Mountains
- Wilderness Study Areas
  - Pigeon Spring
  - Queer Mountain
  - Grapevine Mountains
- Special Recreation Management Area
  - Fish Lake Valley

Although they are within the 25-mi (40-km) radius of the visual analysis area, both the Piper Mountain and Sylvania Mountains WAs and the Grapevine Mountains WSA have no visibility of potential development within the SEZ; thus they are not considered further.

No lands near the SEZ and outside of designated WAs or WSAs have been identified by the BLM to be managed to protect wilderness characteristics.

11.6.3.2 Impacts

11.6.3.2.1 Construction and Operations

The primary potential impacts on specially designated areas generally are from visual impacts of solar energy development that could affect scenic, recreational, or wilderness characteristics of the areas. This visual impact is difficult to determine and would vary by solar technology employed, the specific area being affected, and the perception of individuals viewing

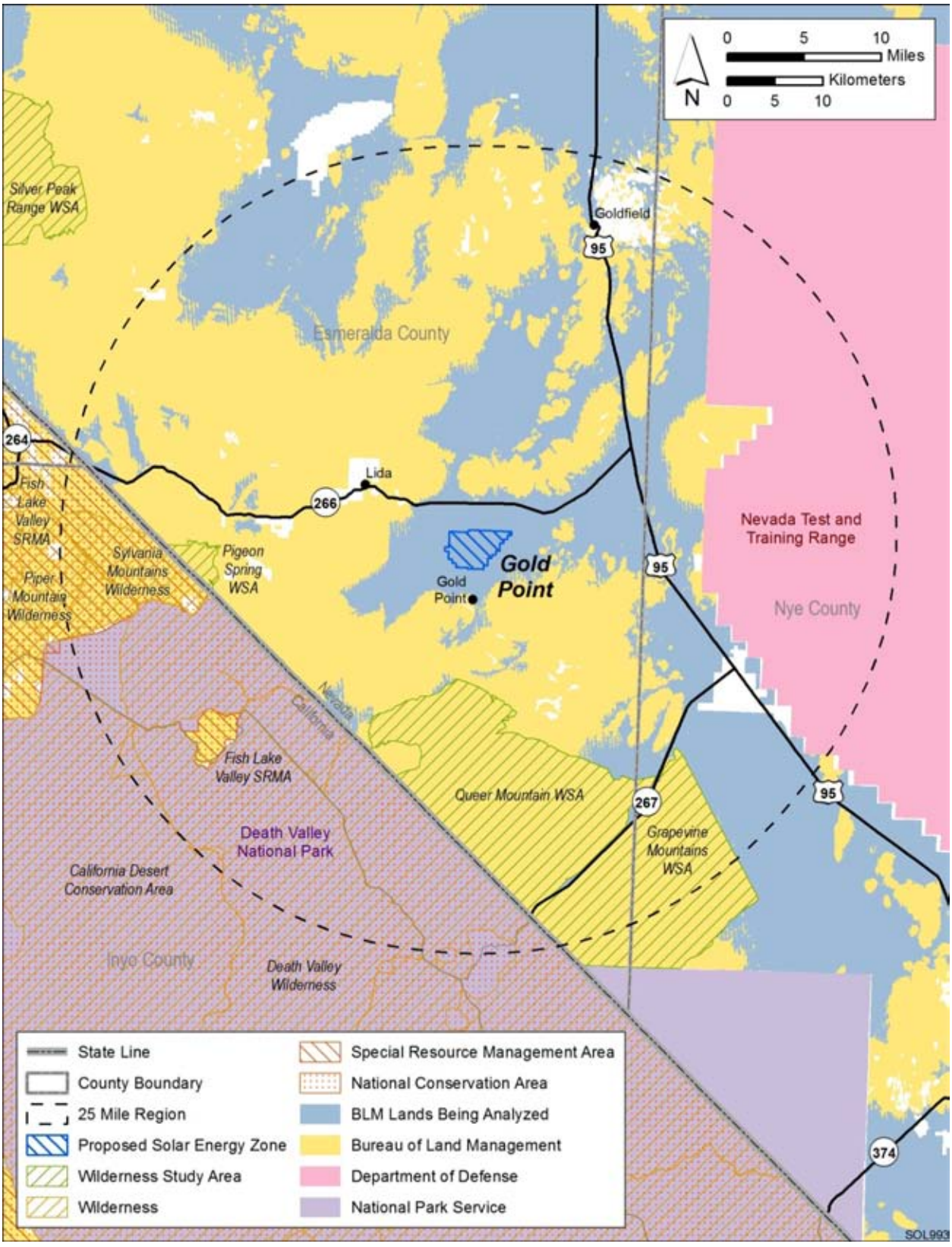

FIGURE 11.6.3.1-1 Specially Designated Areas in the Vicinity of the Proposed Gold Point SEZ

the development. From viewshed analysis, it appears that solar development of the proposed Gold Point SEZ would not be a significant factor in the viewshed of any of these specially designated areas, as summarized in Table 11.6.3.2-1. Five of the specially designated areas would have no significant acreage with visibility of development within the SEZ closer than 15 mi (24 km). The data provided in the table assume the use of 650-ft (98.1-m) power tower solar energy technology, which because of the potential height of these facilities, could be visible from the largest amount of land of the technologies being considered in the PEIS. (See Section 11.6.14 for more detail on all viewshed analysis discussed in this section). Assessment of the visual impact of solar energy projects must be conducted on a site-specific and technology-specific basis to accurately identify impacts.

In general, the closer a viewer is to solar development, the greater the impact on an individual's perception. From a visual analysis perspective, the most sensitive viewing distances generally are from 0 to 5 mi (0 to 8 km). The viewing height above a solar energy development area, the size of the solar development area, and the purpose for which a person is visiting an area are also important. Individuals seeking a wilderness or scenic experience within these areas

TABLE 11.6.3.2-1 Potentially Affected Specially Designated Areas within a 25-mi (40-km) Viewshed of the Proposed Gold Point SEZ[a]

		Feature Area[c]		
			Visible between	
Feature Type	Feature Name (Total Acreage)[b]	Visible within 5 mi	5 mi and 15 mi	15 mi and 25 mi
National Park	Death Valley (3,397,062 acres)	0 acres	67 acres (0%)	3,814 acres (0.11%)
National Conservation Area	California Desert (25,919,319 acres)	0 acres	67 acres (0%)	4,265 acres (0.02%)
WAs	Death Valley (3,074,256 acres)	0 acres	67 acres (0%)	3,774 acres (0.12%
WSAs	Pigeon Spring (3,651 acres)	0 acres	0 acres (0%)	8 acres (0.21%)
	Queer Mountain (85,294 acres)	0 acres	1,276 acres	1,276 acres (0.23%)
SRMA	Fish Lake Valley (196,811 acres)	0 acres	0 acres	460 (0.23%)

[a] Assuming power tower solar technology with a height of 650 ft (198.1 m).

[b] To convert acres to km^2, multiply by 0.004047. To convert mi to km, multiply by 1.609.

[c] Percentage of total feature acreage viewable.

could be expected to be more adversely affected than those simply traveling along a highway with another destination in mind.

The occurrence of glint and glare at solar facilities could potentially cause large though temporary increases in brightness and visibility of the facilities. The visual contrast levels projected for sensitive visual resource areas that were used to assess potential impacts on specially designated areas do not account for potential glint and glare effects; however, these effects would be incorporated into a future site-and project-specific assessment that would be conducted for specific proposed utility-scale solar energy projects.

California Desert Conservation Area (CDCA), Death Valley National Park, and Death Valley Wilderness Area.

These areas are all located in California, and the state line is about 12.5 mi (20 km) southwest of the SEZ. The three areas overlap one another in this area; the WA is within the National Park, which is within the CDCA.

Solar facilities within the SEZ could be visible from the summits and northeast-facing slopes of higher peaks in the area surrounding Last Chance Mountain in the northern portion of Death Valley NP, at a distance of about 16 to 18 mi (26 to 29 km) from the SEZ. This area with visibility encompasses about 4,000 acres (16 km^2); however, visibility in about one-third of the area would be restricted only to taller solar facility components, such as transmission towers and power towers. Some viewpoints would have clear, but long-distance, views of the SEZ, but the SEZ would occupy only a very small part of the horizontal field of view, and the vertical viewing angle would be very low, despite the elevated viewpoints. Furthermore, most of the area has scattered vegetation, and some views of the SEZ could therefore be subject to screening. Three additional small areas with visibility of the SEZ exist at distances from 14 to 20 mi (23 to 30 km) from the SEZ. The largest of these areas is less than 200 acres (0.8 km^2) in size, and in these smaller areas, visibility would be limited to the upper portions of tall power towers in the SEZ. Visual contrast levels caused by solar facilities within the SEZ for viewpoints within all of the areas described would not be expected to exceed very weak levels. For that reason, it is anticipated that there would be no adverse impacts on wilderness, scenic, or recreational resources within these three specially designated areas.

Because of the lack of development in the immediate region of the SEZ, the night sky is very dark. The NPS has identified the concern that solar facility development in the region adjacent to Death Valley NP could adversely affect the quality of the night sky environment as viewed from the park. The amount of light that could emanate from this relatively small SEZ is not known, but it could adversely affect night sky viewing from limited portions of the National Park and the adjoining wilderness and other specially designated areas.

Queer Mountain WSA

The boundary of this WSA is directly south of the SEZ at a distance of 7 mi (11 km) at the closest point of approach. At a distance of about 10 mi (16 km) from the SEZ, solar facilities

in the SEZ could be visible from about 1,400 acres (5.7 km^2) within the WSA on summits and north-facing slopes of Gold Mountain and some ridges to the west of Gold Mountain in the northern portion o f the area. From the highest peaks and ridges in those portions of the WSA that have views of the SEZ, the ridges of Slate Ridge screen portions of the SEZ from view; however, from some viewpoints most of the SEZ would be visible, and the SEZ would occupy a moderate amount of the horizontal field of view. The vertical angle of view is low, but high enough that the tops of collector/reflector arrays within the SEZ would likely be visible. From these very high-elevation viewpoints, visual contrast levels from solar facilities could potentially reach moderate levels; for lower-elevation viewpoints, very weak or weak levels of visual contrast would be expected. Because of these levels of contrast and the distance from the SEZ, it is anticipated that there would be no adverse impact on wilderness characteristics in the WSA.

Pigeon Spring WSA

This WSA is 15 mi (24 km) west of the SEZ. Because of topographic screening, only a very small area within the WSA about 16 mi (26 km) from the westernmost boundary of the SEZ would have any visibility of development in the SEZ. Because of the long distance view and very low contrast levels from solar energy facilities, it is anticipated that there would be no impact on wilderness characteristics within the WSA.

Fish Lake Valley SRMA

The BLM-administered Fish Lake Valley SRMA is located within the CDCA and is surrounded by Death Valley NP and Death Valley WA and is composed of two areas that are about 6 mi (10 km) apart. The nearest boundary of the southern, smaller area of the SRMA is located about 17 mi (27 km) southwest of the SEZ and is surrounded by designated wilderness within Death Valley NP. This portion of the SRMA is not designated as wilderness.

The nearest boundary of the larger northern portion of the SRMA is west of the SEZ about 16 mi (26 km). This portion of the SRMA contains the Sylvania Mountains and Piper Mountain WAs, the White Mountains WSA, and some undesignated public lands. Although almost all of the Sylvania Mountains, a portion of the Piper Mountain WAs, and some public lands are within the 25-mi (40-km) visual analysis area surrounding the SEZ this portion of the SRMA has no areas with views of the SEZ; thus there would be no impact from solar energy development.

Within the smaller portion of the SRMA, there is very limited visibility of the SEZ from less than 500 acres (2 km^2) of the northeast-facing slopes of a few of the higher peaks in the area, at an approximate distance of 18 to 19 mi (29 to 31 km) from the SEZ. Land surface within the SEZ would not be visible from this area, but the upper portions of power towers and transmission towers located in the far northern portion of the SEZ might just be visible over intervening mountains. It is unlikely that the solar facilities would be seen by casual viewers, and even if they were, expected visual contrast levels would be minimal. It is

anticipated that there would be no impact on recreational use in this portion of the SRMA from development within the SEZ.

11.6.3.2.2 Transmission Facilities and Other Off-Site Infrastructure

See Section 11.6.2.2.2 for the assumptions regarding the construction of new transmission facilities. Depending on their location and visibility, new transmission facilities could potentially cause additional visual impacts on the specially designated areas listed above. However, because of the limited amount of area with visibility of the transmission line route and the distance to the route, it is not anticipated that the impacts would be significant.

There would be no impacts outside of the SEZ to provide for road access to the area.

11.6.3.3 SEZ-Specific Design Features and Design Feature Effectiveness

Implementing the programmatic design features described in Appendix A, Section A.2.2, as required under BLM's Solar Energy Program, would provide adequate mitigation for some potential impacts.

A proposed design feature specific to the Gold Point SEZ includes:

- Transmission line construction should be routed and constructed in such a way as to minimize visual impacts on specially designated areas.

11.6.4 Rangeland Resources

11.6.4.1 Livestock Grazing

Rangeland resources managed by the BLM on BLM-administered lands include livestock grazing and habitat for wild horses and burros. These resources and possible impacts on them from solar development within the proposed Gold Point SEZ are discussed in Sections 11.6.4.1 and 11.6.4.2.

11.6.4.1.1 Affected Environment

One grazing allotment overlaps the proposed SEZ—the large Magruder Mountain allotment. The allotment contains 667,139 acres (2,700 km^2) of public and private lands and has an active grazing authorization of 6,300 AUMs (BLM 2009c). A total of 4,810 acres (19 km^2), or 0.7%, of the allotment is within the SEZ.

11.6.4.1.2 Impacts

Construction and Operations

Should utility-scale solar development occur in the Gold Point SEZ, grazing would be excluded from the areas developed, as provided for in the BLM grazing regulations (43 CFR Part 4100). The regulations provide for reimbursement of permittees for their portion of the value for any range improvements in the area removed from the grazing allotment. The impact of this change in the grazing permits would depend on several factors, including (1) how much of an allotment the permittee might lose to development, (2) how important the specific land lost is to the permittee's overall operation, and (3) the amount of actual forage production that would be lost by the permittee.

Since less than 1% of the Magruder Mountain allotment overlaps the SEZ, the loss of this small amount of area is anticipated to have no impact on grazing use because the loss of use from the SEZ likely could be absorbed elsewhere in the allotment.

Transmission Facilities and Other Off-Site Infrastructure

Connecting the SEZ to the regional power grid would require the construction of about 22 mi (35 km) of new transmission line and would disturb about 667 acres (2.7 km^2) allocated in the Magruder Mountain allotment. This additional loss of land also would not be significant for the operation of the allotment.

There would be no impacts outside of the SEZ to provide for road access to the area. See Section 11.6.1.2 regarding development assumptions for the SEZ.

11.6.4.1.3 SEZ-Specific Design Features and Design Feature Effectiveness

No SEZ-specific design features are required to protect livestock grazing. Implementing the programmatic design features described in Appendix A, Section A.2.2, as required under BLM's Solar Energy Program, would provide adequate protection for livestock grazing.

11.6.4.2 Wild Horses and Burros

11.6.4.2.1 Affected Environment

Section 4.4.2 discusses wild horses (*Equus caballus*) and burros (*E. asinus*) that occur within the six-state study area. Nearly 100 wild horse and burro herd management areas (HMAs) occur within Nevada (BLM 2009d). Ten HMAs in Nevada are located wholly or partially within the 50-mi (80-km) SEZ region for the proposed Gold Point SEZ, while two HMAs in California also occur partially or wholly within the SEZ region (BLM 2010) (Figure 11.6.4.2-1). None of the HMAs occur within the SEZ. Portions of the Palmetto and Gold Mountain HMAs occur within the indirect impact area of the SEZ. They are located 2.2 and 2.9 mi (3.5 and 4.7 km), respectively, from the SEZ. In FY 2009, no wild horses or burros occurred in the Palmetto HMA. Six wild horses and one wild burro occurred in the Gold Mountain HMA in FY 2009; the appropriate management levels were no wild horses and 78 wild burros (BLM 2010a). The Goldfield HMA occurs within the assumed transmission line corridor for the proposed Gold Point SEZ (Figure 11.6.4.2-1). In FY 2009, the Goldfield HMA contained a population of 8 wild horses and 20 wild burros and had an appropriate management level of no wild horses and 37 wild burros (BLM 2010a).

In addition to the HMAs managed by the BLM, the USFS has wild horse and burro territories in Arizona, California, Nevada, New Mexico, and Utah and is the lead management agency that administers 37 of the territories (Giffen 2009; USFS 2007). The closest territory to the proposed Gold Point SEZ is the Monitor Territory, located about 51 mi (82 km) north of the Gold Point SEZ (Figure 11.6.4.2-1).

11.6.4.2.2 Impacts

Because the proposed Gold Point SEZ is about 2.2 mi (3.5 km) or more from any wild horse and burro HMA managed by the BLM and about 51 mi (82 km) from any wild horse and burro territory administered by the USFS, solar energy development within the SEZ would not directly affect wild horses and burros that are managed by these agencies. Indirect impacts on wild horses and burros within the Gold Mountain HMA could result from fugitive dust generated by project activities, noise, lighting, spread of invasive species, accidental spills, and harassment. Indirect impacts would be negligible with the implementation of design features.

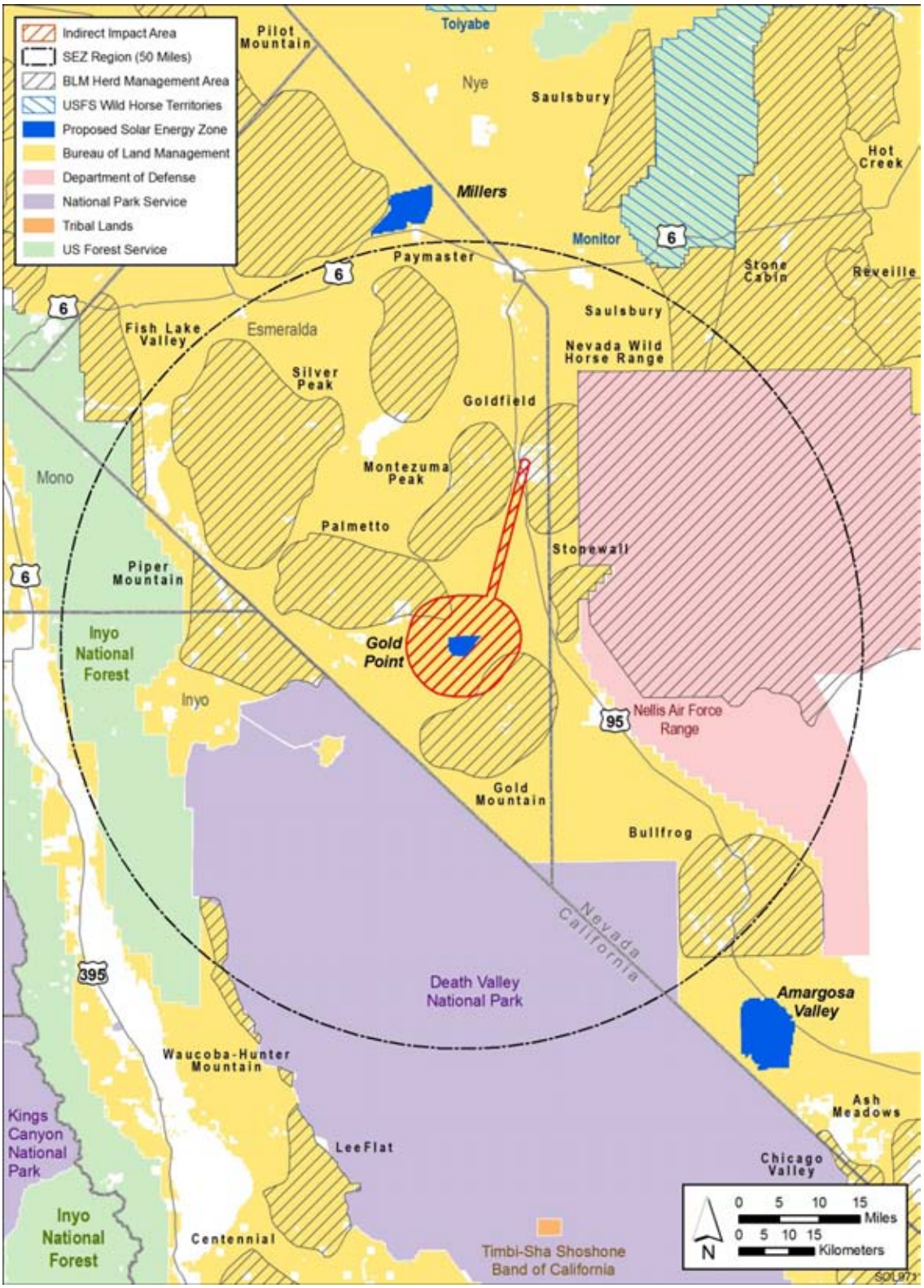

FIGURE 11.6.4.2-1 Wild Horse and Burro Herd Management Areas and Territories within the Analysis Area for the Proposed Gold Point SEZ (Sources: BLM 2009d, 2010a; USFS 2007)

About 904 acres (3.7 km^2) of the assumed transmission line corridor for the Gold Point SEZ occurs within the 62,367-acre (252.4-km^2) Goldfield HMA (Figure 11.6.4.2-1). Construction of the transmission line would result in a direct impact on 43 acres (0.2 km^2), or about 0.07%, of the HMA. This would result in a small temporary direct impact on the wild horses and burros within the HMA and would not have an overall adverse impact on the management of the animals within the Goldfield HMA. Following construction, wild horses and burros would be able to use the rangelands within the transmission line ROW. Indirect impacts, as discussed above, could also be incurred by the wild horses and burros within the SEZ. These impacts would be negligible with the implementation of programmatic design features.

11.6.4.2.3 SEZ-Specific Design Features and Design Feature Effectiveness

No SEZ-specific design features for solar development within the proposed Gold Point SEZ would be necessary to protect or minimize direct impacts on wild horses and burros. Indirect impacts should be reduced to negligible levels by implementing programmatic design features and engineering controls that reduce noise lighting, spills, and fugitive dust.

11.6.5 Recreation

11.6.5.1 Affected Environment

The site of the proposed Gold Point SEZ is an isolated area with no natural features that invite recreational use. The area is flat but gently sloping to the northeast, with much gravel pavement and uniform low-growing vegetation consisting primarily of shadscale, greasewood, and winterfat, with some Indian ricegrass. The overall appearance of the site is uniform and somewhat monotonous. There are a few scattered dirt trails that provide access into the area. The area is classified as open to vehicle use (BLM 1997). Although there are no recreation figures for the area, it is believed that the area receives no significant recreational use.

11.6.5.2 Impacts

Construction and Operations

Any recreational use would be eliminated from portions of the SEZ developed for solar energy production, and existing recreational users would be displaced. The area is not a major recreation destination, and the loss of recreational opportunities would not be significant. If open OHV routes within the SEZ were identified during project-specific analyses, these routes would be re-designated as closed (see Section 5.5.1 for more details on how routes coinciding with proposed solar facilities would be treated).The SEZ is relatively small and there are good roads around the north and east sides of the SEZ; thus solar development within the SEZ would not cause the public to be hindered from accessing other public lands in the area.

Transmission Facilities and Other Off-Site Infrastructure

The construction of about 22 mi (35 km) of new transmission line and would disturb about 667 acres (2.7 km^2) northeast of the SEZ. This additional land disturbance would not be anticipated to have a significant impact on recreation use.

There would be no impacts outside of the SEZ caused by road construction to provide road access to the area.

11.6.5.3 SEZ-Specific Design Features and Design Feature Effectiveness

No SEZ-specific design features to protect recreational use in the area are required. Implementing the programmatic design features described in Appendix A, Section A.2.2, as required under BLM's Solar Energy Program, would provide adequate mitigation for recreation resources.

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11.6.6 Military and Civilian Aviation

11.6.6.1 Affected Environment

The proposed Gold Point SEZ is located under numerous MTRs, one of which can be used down to 100 ft (30 m) AGL. The area is also located between two MOAs. The area is located within a zone identified in BLM land records as a DoD Consultation Area.

The nearest public airport is the Lida Junction Airport, a small BLM airport about 10 mi (16 km) from the SEZ at the junction of State Route 266 and U.S. 95. The airport has a single dirt runway and has no regularly scheduled use.

11.6.6.2 Impacts

The military has expressed serious concern over solar energy facilities being constructed within the Gold Point SEZ. It is especially concerned over the potential use of power tower facilities. Nellis Air Force Base has indicated that it has concerns for its use of the MTRs because of potential overflight restrictions above a solar energy facility caused by the height of solar facilities, possible restrictions on hydrocarbon or residue from fuel burn by aircraft, possible glare from reflective surfaces, and any potential restrictions on supersonic operations over solar facilities. The NTTR has indicated that solar technologies requiring structures higher than 50 ft (15 m) AGL may present unacceptable electromagnetic compatibility concerns for its test mission at NTTR. The NTTR maintains that a pristine testing environment is required for the unique national security missions conducted on the NTTR. In the military's opinion, the potential electromagnetic interference impacts from solar facilities on testing activities at the NTTR, coupled with potential training route obstructions created by taller structures, make it likely that solar facilities exceeding 50 ft (50 m) could significantly affect military operations.

The Air Force has stated that the NTTR complex is unique in the world in its ability to provide realistic training of air crews. In addition to the effect of individual solar energy facilities, there is a more general concern over the potential for cumulative effects from multiple solar energy projects around the NTTR to eventually have a serious adverse effect on the training environment of the NTTR.

The Lida Junction Airport is located far enough away from the proposed SEZ that there would be no effect on airport operations. Any solar or related facilities in excess of 199 ft (61 m) would require an FAA evaluation of flight hazards and could require hazard marking lights.

11.6.6.3 SEZ-Specific Design Features and Design Feature Effectiveness

No SEZ-specific design features to protect military or civilian aviation use in the area are required. The programmatic design features described in Appendix A, Section A.2.2, would require early coordination with the DoD to identify and mitigate, if possible, potential impacts on the use of MTRs.

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11.6.7 Geologic Setting and Soil Resources

11.6.7.1 Affected Environment

11.6.7.1.1 Geologic Setting

Regional Setting

The proposed Gold Point SEZ is located in the southern part of Lida Valley, a closed intermontane basin within the Basin and Range physiographic province in southern Nevada. The southern part of the valley lies between the Mount Jackson Ridge and Cuprite Hills to the north and Slate Ridge to the south. It is bounded on the west by the Palmetto Mountains and on the east by the Stonewell Mountains (Figure 11.6.7.1-1).

Basin fill consists of Quaternary and Tertiary alluvial fan and playa deposits of variable thickness and induration. Recent gravity surveys in the southern part of Lida Valley indicate that basin-fill sediments are up to 570 ft (175 m) thick near Stonewall Pass, just west of I-95, increasing northward to greater than 1,640 ft (500 m) near the alkali flat (Hasbrouck 2010a,b).

Exposed sediments within and adjacent to the proposed SEZ consist mainly of modern alluvial, eolian, and playa deposits (Figure 11.6.7.1-2). Exposures in the surrounding mountains are predominantly Jurassic- and Cretaceous-age felsic intrusive rocks (diorite and granite), especially along Slate Ridge south and southwest of the SEZ. Paleozoic and Precambrian metamorphic rocks are exposed in the Palmetto Mountains and along Slate Ridge.

Topography

The southern part of Lida Valley (south of Mount Jackson Ridge) is a northeast-trending basin, about 20-mi (32-km) long and 7-mi (11-km) wide. Elevations along the valley axis range from about 5,300 ft (1,615 m) near the southwest end and along the valley sides to about 4,700 ft (1,430 m) at the northeastern end of the valley (Figure 11.6.7.1-1). Moderately sloping alluvial fan deposits occur along the mountain fronts, especially to the northwest (Palmetto Mountains) and northeast (Stonewall Mountains). The valley is drained by the Jackson Wash, an ephemeral stream that flows from Jackson Flat (through a breech in Mount Jackson Ridge) to an alkali flat at the valley's northeastern end and then on to the south toward Sarcobatus Flat. The alkali flat (also called the Lida Valley playa) is being explored as a source of lithium placer deposits (First Liberty Power 2010).

The proposed Gold Point SEZ is located in the southern part of Lida Valley. Its terrain gently slopes to the northeast. Elevations range from about 5,040 ft (1,535 m) along the southwestern boundary to about 4,840 ft (1,475 m) at its northeastern corner (Figure 11.6.7.1-3). Jackson Wash flows to the northeast through the center of the site.

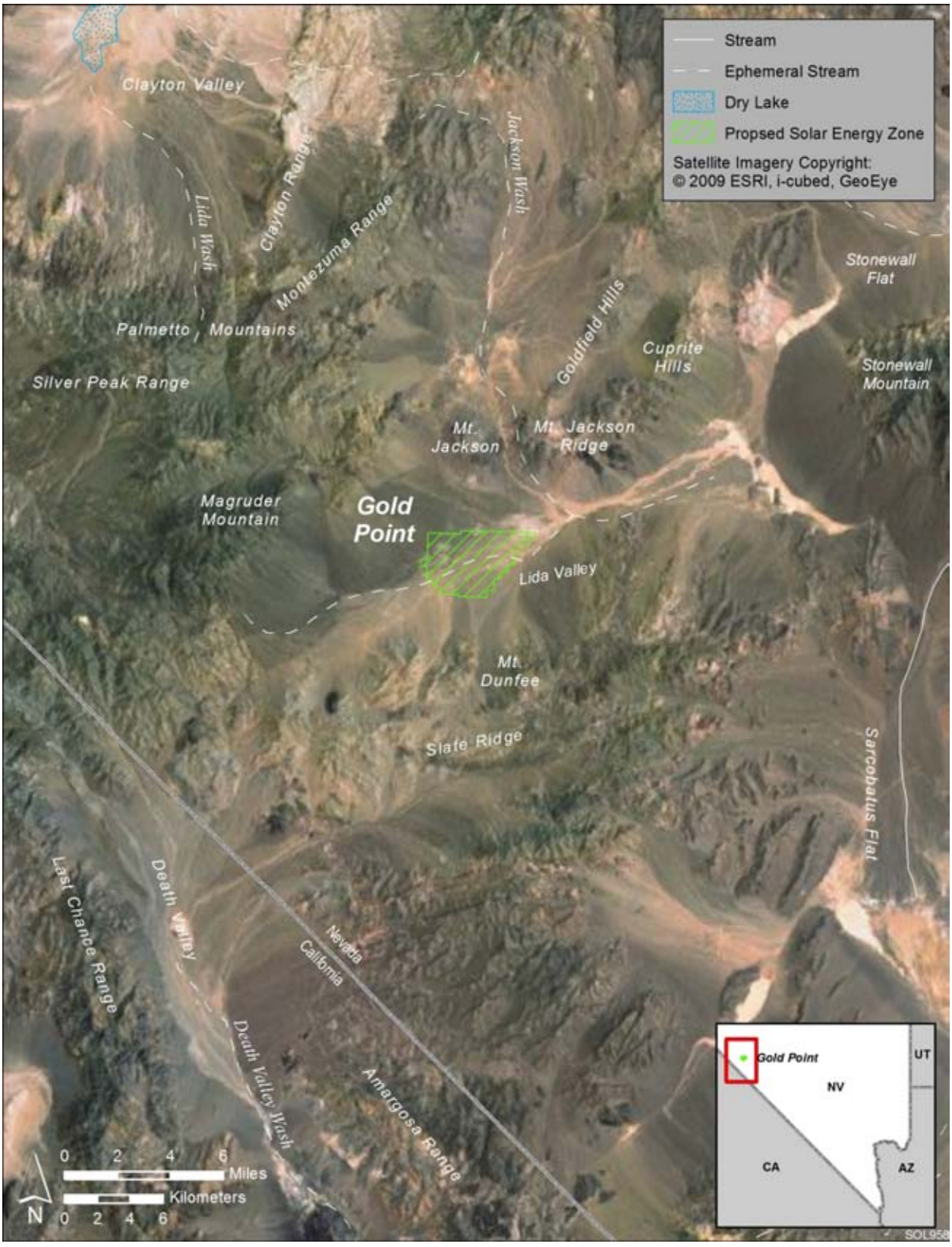

FIGURE 11.6.7.1-1 Physiographic Features of the Lida Valley Region

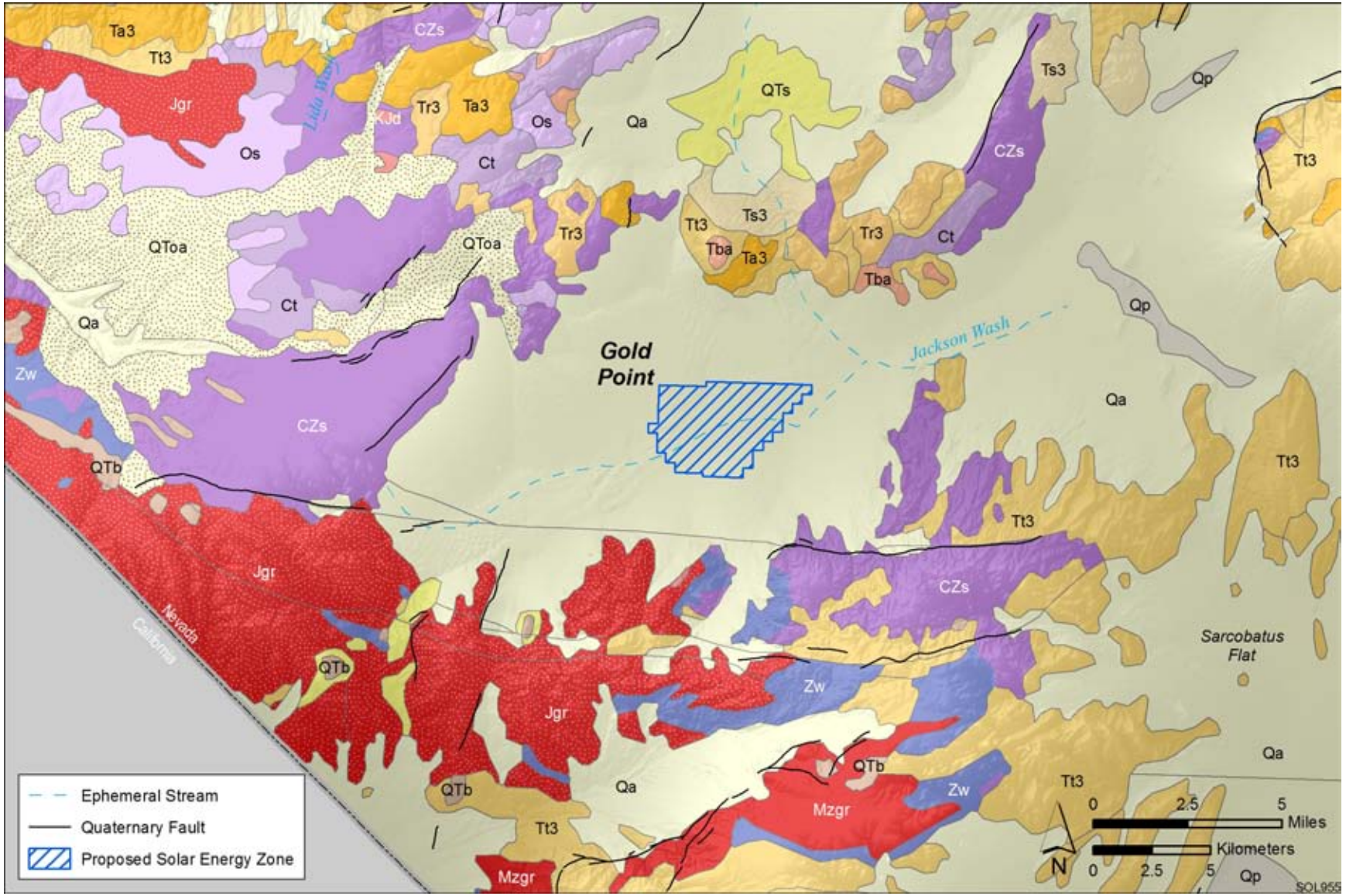

FIGURE 11.6.7.1-2 Geologic Map of the Lida Valley Region (Ludington et al. 2007; Stewart and Carlson 1978)

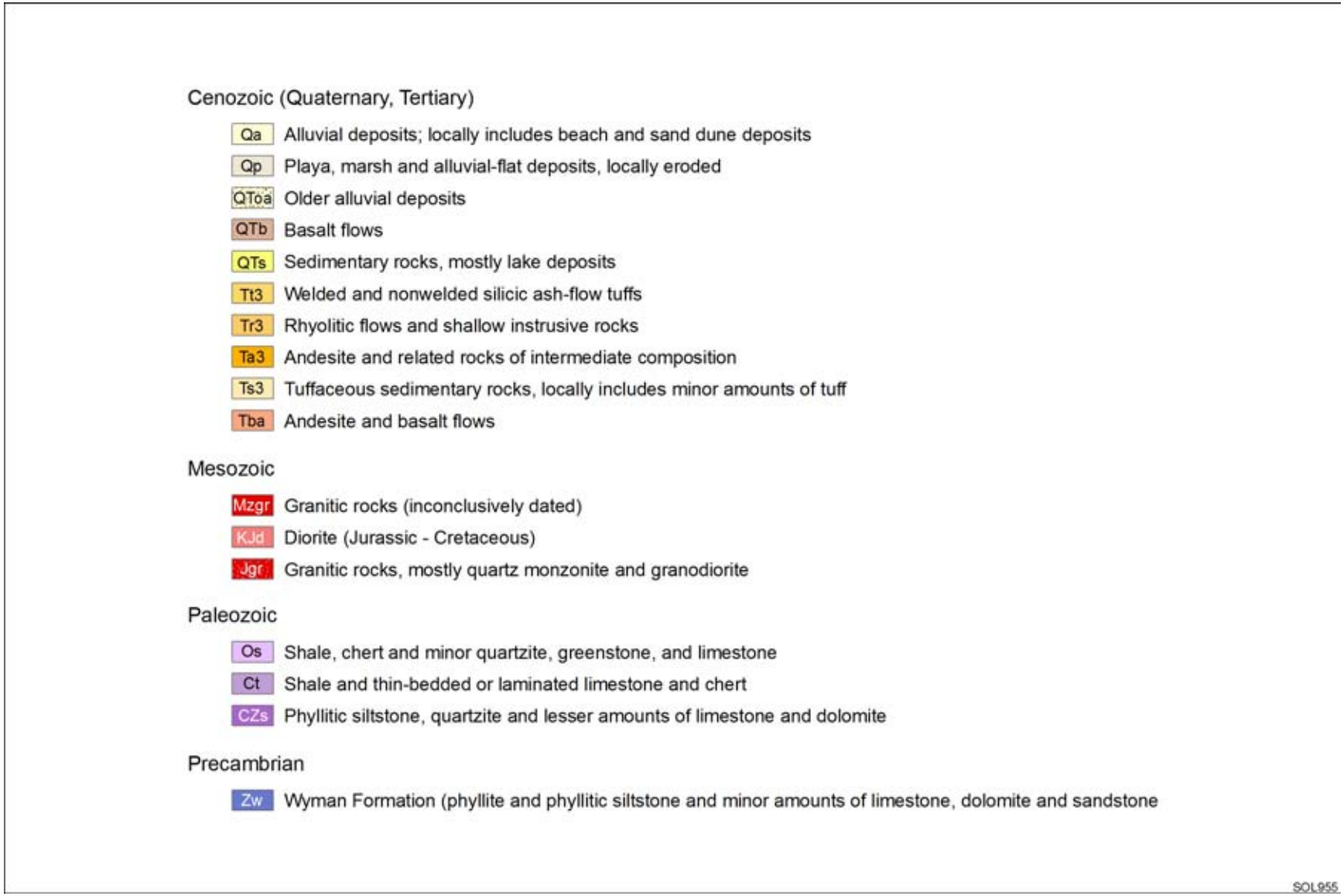

FIGURE 11.6.7.1-2 (Cont.)

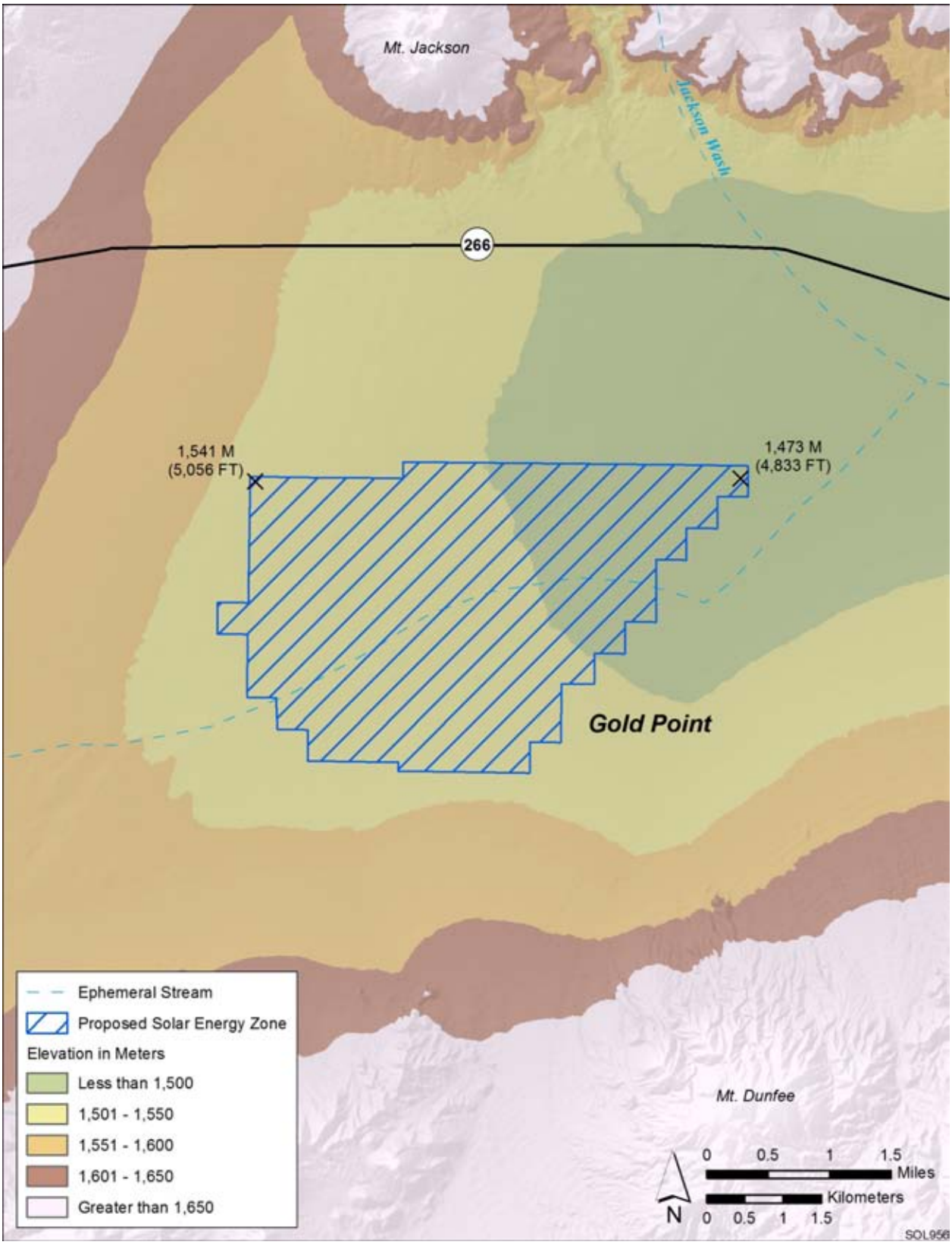

FIGURE 11.6.7.1-3 General Terrain of the Proposed Gold Point SEZ

Geologic Hazards

The types of geologic hazards that could potentially affect solar project sites and their mitigation are discussed in Section 5.7.3. The following sections provide a preliminary assessment of these hazards at the proposed Gold Point SEZ. Solar project developers may need to conduct a geotechnical investigation to identify and assess geologic hazards locally to better identify facility design criteria and site-specific mitigation measures to minimize their risk.

Seismicity. Lida Valley is located within the Walker Lane Belt, a northwest-trending seismic region along the Nevada–California border that accommodates (right-lateral shear) strain from movement between the Pacific and North American plates. Although there are no faults within or immediately adjacent to the Gold Point SEZ, several Quaternary faults and fault systems occur along the margins of Lida Valley. These include the Gold Mountain and Slate Ridge faults to the south, Wild Rose Spring and Lida faults to the west, and Stonewall Flat and Stonewell Mountain faults to the northeast. The most recently active faults in the region are within the northwest-striking Fish Lake Valley fault zone (less than 15,000 years old), located in California, parallel to the California–Nevada state line (Figure 11.6.7.1-4).

From June 1, 2000, to May 31, 2010, 107 earthquakes were recorded within a 61-mi (100-km) radius of the proposed Gold Point SEZ (USGS 2010a). The largest earthquake during that period occurred on August 2, 2001. It was located about 26 mi (43 km) southwest of the SEZ in the Eureka Valley (California) and registered a Richter scale magnitude[1] (ML) of 4.3 (Figure 11.6.7.1-4). During this period, 45 (42%) of the recorded earthquakes within a 61-mi (100-km) radius of the SEZ had magnitudes greater than 3.0; none were greater than 4.3 (USGS 2010a).

Liquefaction. The proposed Gold Point SEZ lies within an area where the peak horizontal acceleration with a 10% probability of exceedance in 50 years is between 0.15 and 0.20 g. Shaking associated with this level of acceleration is generally perceived as moderate; however, the potential damage to structures is light (USGS 2008). Given the deep water table (from 300 to 400 ft [91 to 122 m] below the surface [USGS 2010c]) and the low intensity of ground shaking estimated for Lida Valley, the potential for liquefaction in sediments within and around the SEZ is also likely to be low.

Volcanic Hazards. Lida Valley is located about 60 mi (90 km) to the west-northwest of the southwestern Nevada volcanic field, which consists of volcanic rocks (tuffs and lavas) of the Timber Mountain-Oasis Valley caldera complex and Silent Canyon and Black Mountain calderas. The area has been studied extensively because of its proximity to the Nevada Test Site

[1] Richter scale magnitude (ML) was the original magnitude defined by Richter and Gutenberg for local earthquakes in 1935. It was based on the maximum amplitude recorded on a Wood-Anderson torsion seismograph but is currently calculated for earthquakes with magnitudes ranging from 2 to 6, using modern instruments with adjustments (USGS 2010b).

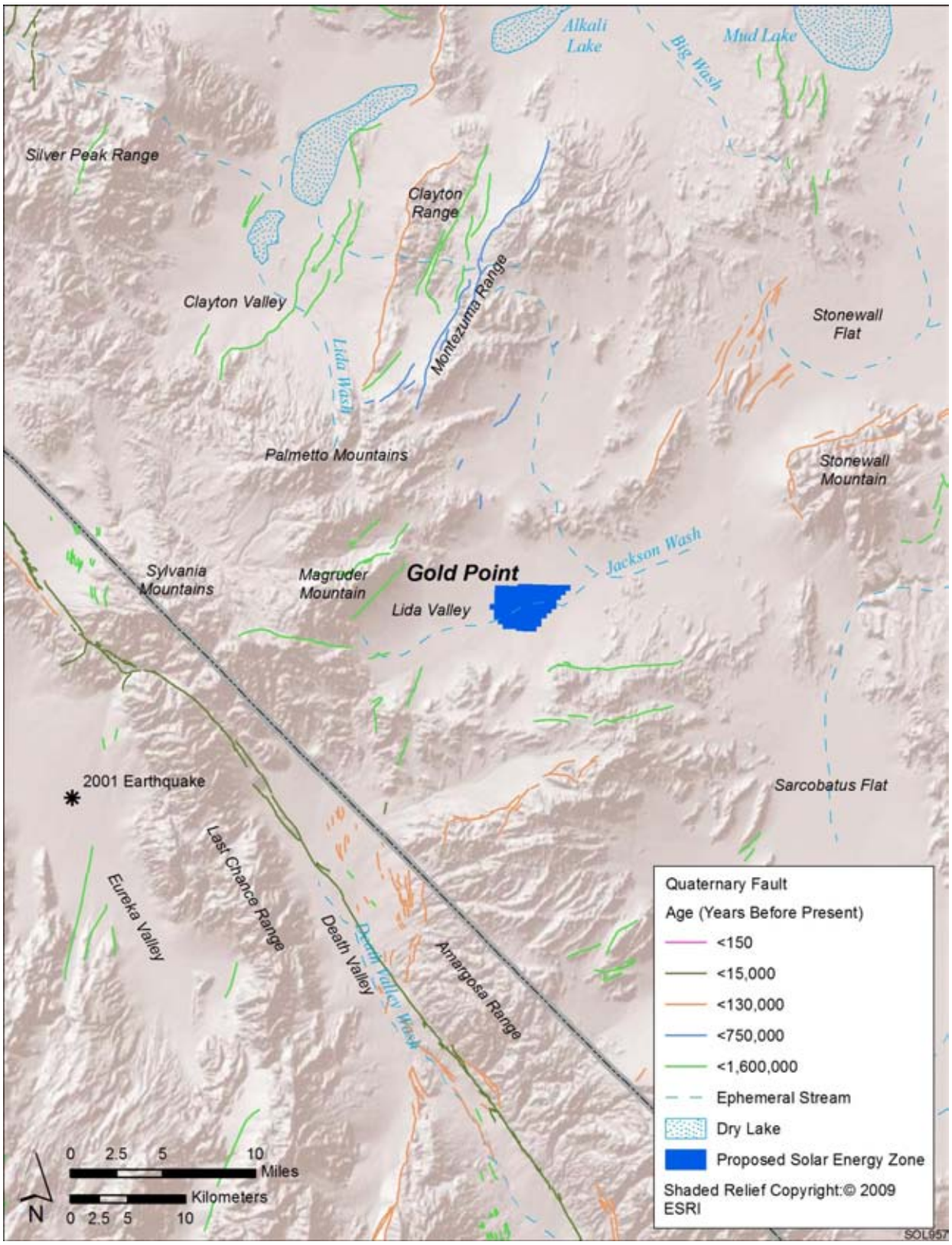

FIGURE 11.6.7.1-4 Quaternary Faults in the Lida Valley Region (USGS and NBMG 2010; USGS 2010a)

and Yucca Mountain repository. Two types of fields are present in the region: (1) large-volume, long-lived fields with a range of basalt types associated with more silicic volcanic rocks produced by melting of the lower crust, and (2) small-volume fields formed by scattered basaltic scoria cones during brief cycles of activity, called rift basalts because of their association with extensional structural features. The basalts of the region typically belong to the second group; examples include the basalts of Silent Canyon and Sleeping Butte (Byers et al. 1989; Crowe et al. 1983).

The oldest basalts in the region were erupted during the waning stages of silicic volcanism in the southern Great Basin in the Late Miocene and are associated with silicic volcanic centers like Dome Mountain (the first group). Rates of basaltic volcanic activity in the region have been relatively constant but generally low. Basaltic eruptions closest to the proposed Gold Point SEZ occurred from 1.7 million to 700,000 years ago, creating the cinder cones within Crater Flat (Stuckless and O'Leary 2007). The most recent episode of basaltic eruptions occurred at the Lathrop Wells Cone complex about 80,000 years ago (about 8 mi [13 km] east of the SEZ) (Stuckless and O'Leary 2007). There has been no silicic volcanism in the region in the past 5 million years. Current silicic volcanic activity occurs entirely along the margins of the Great Basin (Crowe et al. 1983).

Crowe et al. (1983) determined that the annual probability of a volcanic event for the region is very low (3.3×10^{-10} to 4.7×10^{-8}), similar to the probability of 1.7×10^{-8} calculated for the proposed Yucca Mountain repository (Cline et al. 2005). The volcanic risk in the region is associated only with basaltic eruptions; the risk of silicic volcanism is negligible. Perry (2002) cites geologic data that could indicate an increase in the recurrence rate (and thus the probability of disruption). These data include hypothesized episodes of an anomalously high strain rate, the hypothesized presence of a regional mantle hot spot, and new aeromagnetic data that suggest that previously unrecognized volcanoes may be buried in the alluvial-filled basins in the region.

Slope Stability and Land Subsidence. The incidence of rock falls and slope failures can be moderate to high along mountain fronts and can present a hazard to facilities on the relatively flat terrain of valley floors such as Lida Valley, if they are located at the base of steep slopes. The risk of rock falls and slope failures decreases toward the flat valley center.

No land subsidence monitoring has taken place in Lida Valley to date; however, Katzenstein and Bell (2005) report ground subsidence of 1 to 1.5 in. (2.5 to 3.5 cm) related to groundwater withdrawal in the Amargosa Valley, about 60 mi (100 km) southeast of the Gold Point SEZ, which has caused compaction in the underlying aquifer. Subsidence is not generally a serious hazard if it occurs as a broad depression over a large region (except in flood-prone areas sensitive to changes in elevation). The major problems associated with subsidence occur as a result of differential vertical subsidence, horizontal displacement, and earth fissures (Burbey 2002).

Other Hazards. Other potential hazards at the proposed Gold Point SEZ include those associated with soil compaction (restricted infiltration and increased runoff), expanding clay

soils (destabilization of structures), and hydro-compactable or collapsible soil (settlement). Disturbance of soil crusts and desert pavement on soil surfaces may increase the likelihood of soil erosion by wind.

Alluvial fan surfaces, such as those found in Lida Valley, can be the sites of damaging high-velocity flash floods and debris flows during periods of intense and prolonged rainfall. The nature of the flooding and sedimentation processes (e.g., stream flow versus debris flow) will depend on the specific morphology of the fan (National Research Council 1996). Section 11.6.9.1.1 provides further discussion of flood risks within the Gold Point SEZ.

11.6.7.1.2 Soil Resources

Soils within the Gold Point SEZ are predominantly sandy loams, gravelly sandy loams, and gravelly loams of the Keefa-Itme, Stonell-Wardenet-Izo, and Papoose-Roic associations, which together cover about 84% of the site (Figure 11.6.7.1-5). Soil map units within the SEZ are described in Table 11.6.7.1-1. These gently to steeply sloping soils are derived from mixed alluvium and the residuum and colluvium of tuffaceous sedimentary rocks. They are predominantly very deep (with the exception of Roic series soils, which occur above a shallow hardpan layer) and well drained. Most of the soils on the site have a low to moderate surface runoff potential and moderate to moderately rapid permeability. The natural soil surface is suitable for roads, with a slight to moderate erosion hazard when used as roads or trails. The water erosion potential is low to moderate for all soils at the site. The susceptibility to wind erosion is moderate for most soils, with as much as 86 tons (78 metric tons) of soil eroded by wind per acre (0.004 km^2,) each year (NRCS 2010). Biological soil crusts and desert pavement have not been documented within the SEZ, but may be present.

None of the soils within the Gold Point SEZ are rated as hydric.[2] Flooding is not likely for soils at the site, occurring with a frequency of less than once in 500 years. None of the soils are classified as prime or unique farmland (NRCS 2010).

11.6.7.2 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. These include soil compaction, soil horizon mixing, soil erosion and deposition by wind, soil erosion by water and surface runoff, sedimentation, and soil contamination. Such impacts are common to all utility-scale solar energy facilities in varying degrees and are described in more detail for the four phases of development in Section 5.7 1.

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).

[2] A hydric soil is a soil that formed under conditions of saturation, flooding, or ponding (NRCS 2010).

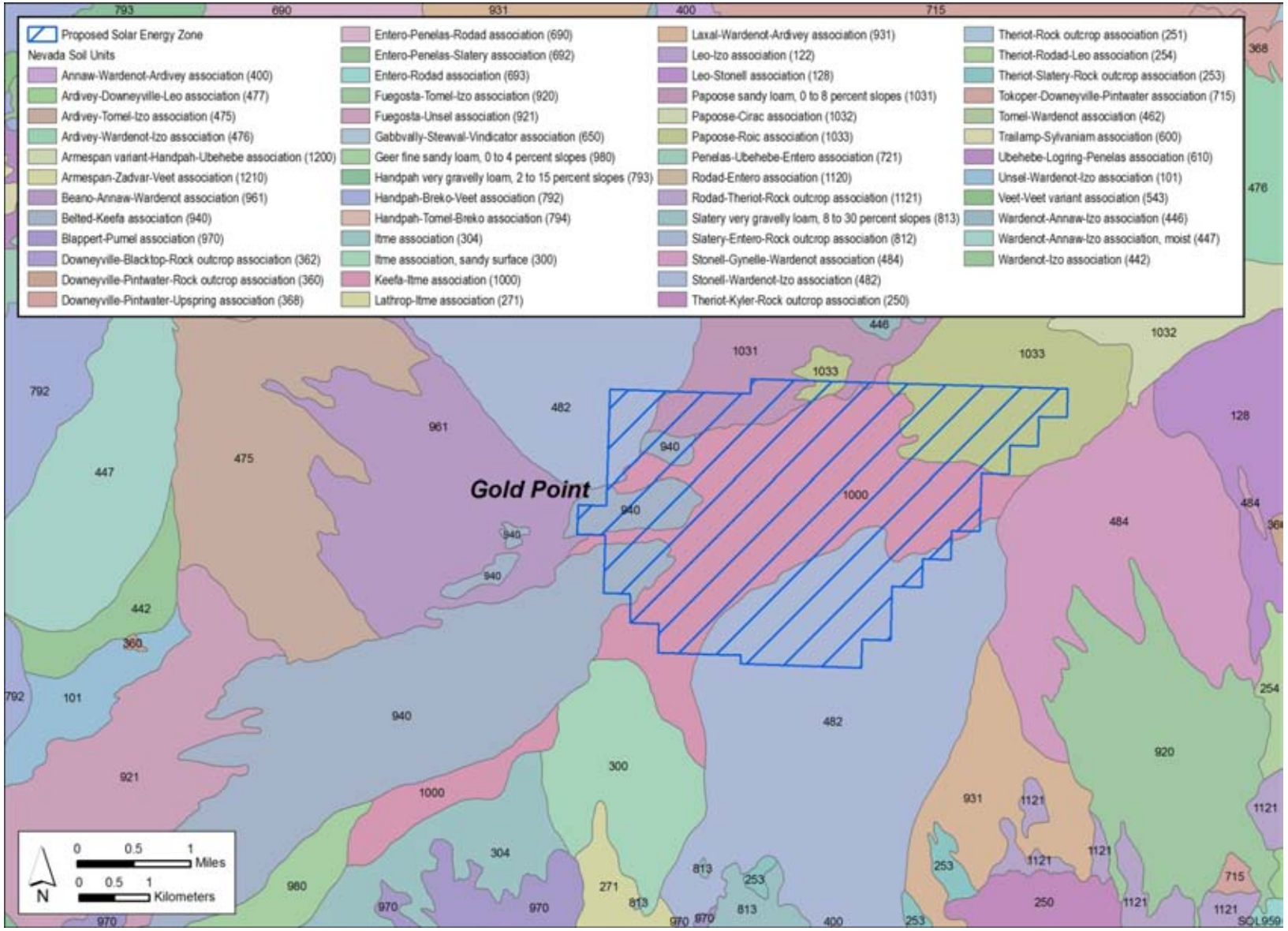

FIGURE 11.6.7.1-5 Soil Map for the Proposed Gold Point SEZ (NRCS 2008)

TABLE 11.6.7.1-1 Summary of Soil Map Units within the Proposed Gold Point SEZ

Map Unit Symbol	Map Unit Name	Water Erosion Potential[a]	Wind Erosion Potential[b]	Description	Area[c] (% of SEZ)
1000	Keefa-Itme association	Low (0.20)	Moderate (WEG 3)[d]	Consists of about 70% Keefa sandy loam and 20% Itme gravelly loamy sand. Gently sloping soils on fan skirts, inset fans, and lake plains. Parent material consists of mixed alluvium (including from granitic rocks). Very deep and well drained, with moderate surface runoff potential and moderately rapid permeability. Available water capacity is low. Moderate rutting hazard. Used mainly as rangeland; unsuitable for cultivation.	2,405 (50)
482	Stonell-Wardenot-Izo association	Low (0.05)	Moderate (WEG 5)	Consists of about 35% Stonell very gravelly sandy loam, 30% Wardenot very gravelly sandy loam, and 20% Izo very gravelly sand. Gently sloping soils on fan remnants, inset fans, and drainage ways. Parent material is mixed alluvium. Very deep and excessively drained, with low surface runoff potential (high infiltration rate) and moderately rapid permeability. Available water capacity is low to very low. Slight rutting hazard. Used mainly as rangeland and wildlife habitat; unsuitable for cultivation.	1,077 (22)
1033	Papoose-Roic association	Moderate (0.37)	Moderate (WEG 3)	Consists of about 50% Papoose sandy loam and 45% Roic very gravelly loam. Gently to steeply sloping soils on lake terraces, hills, and pediments. Parent material is mixed alluvium and residuum and colluvium from tuffaceous sedimentary rocks. Very deep (Papoose soils) and very shallow (Roic soils over shallow paralithic bedrock) and well drained, with moderate surface runoff potential and moderate permeability. Available water capacity is low to very low. Moderate rutting hazard. Used mainly as rangeland or wildlife habitat; small areas may be irrigated and used for cropland (alfalfa and small grains).	577 (12)

1

TABLE 11.6.7.1-1 (Cont.)

Map Unit Symbol	Map Unit Name	Water Erosion Potential[a]	Wind Erosion Potential[b]	Description	Area (% of SEZ)
940	Belted-Keefa association	Low (0.10)	Moderate (WEG 3)	Consists of about 70% Belted gravelly loamy sand and 20% Keefa sandy loam. Gently to steeply sloping soils on beach terraces and fan skirts. Parent material consists of mixed alluvium. Very deep (Keefa soils) and very shallow (Belted soils over shallow duripan) and well drained, with high surface runoff potential (very slow infiltration rate) and moderate permeability. Available water capacity is low to very low. Moderate rutting hazard. Used mainly as rangeland, forest; unsuitable for cultivation.	451 (9)
1031	Papoose sandy loam (0 to 8% slopes)	Moderate (0.37)	Moderate (WEG 3)	Gently sloping soils on lake terraces. Parent material consists of mixed alluvium from tuffs, basalt, and andesite with small amounts of limestone and quartzite. Very deep and well drained, with moderate surface runoff potential and moderately slow permeability. Available water capacity is low. Moderate rutting hazard. Used mainly as rangeland or wildlife habitat; small areas may be irrigated and used for cropland (alfalfa and small grains).	299 (6)

[a] Water erosion potential rates based on soil erosion factor K (whole rock), 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.

[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 c for further explanation).

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

[d] WEG = wind erodibility group. 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 3, 86 tons (78 metric tons) per acre (0.004 km^2) per year and WEG 5, 56 tons (51 metric tons) per acre (0.004 km^2) per year.

Source: NRCS (2010).

The magnitude of impacts would also depend on the types of components built for a given facility since installation of some components would involve greater disturbance and would take place over a longer timeframe.

11.6.7.3 SEZ-Specific Design Features and Design Feature Effectiveness

No SEZ-specific design features were identified for soil resources at the proposed Gold Point SEZ. Implementing the programmatic design features described under both Soils and Air Quality in Appendix A, Section A.2.2, as required under BLM's Solar Energy Program, would reduce the potential for soil impacts during all project phases.

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11.6.8 Minerals (Fluids, Solids, and Geothermal Resources)

11.6.8.1 Affected Environment

As of September 21, 2010, there were no mining claims located in the proposed Gold Point SEZ. The western half of the SEZ, however, was previously blanketed by both lode and placer claims that have been closed (BLM and USFS 2010a). The public land within the SEZ was closed to locatable mineral entry in June 2009 pending the outcome of this PEIS. There are no active oil and gas leases in the area, nor has the area been previously leased (BLM and USFS 2010b). The area remains open for discretionary mineral leasing for oil and gas and other leasable minerals and for disposal of salable minerals. There is no active or historical geothermal leasing or development in or near the SEZ (BLM and USFS 2010b).

11.6.8.2 Impacts

If the area were identified as a solar energy zone, it would continue to be closed to all incompatible forms of mineral development. Since the SEZ does not contain existing mining claims, it was also assumed that there would be no future loss of locatable mineral production.

For the purpose of this analysis, it was assumed that future development of oil and gas resources, should any be found, would still be possible, since such development could occur with directional drilling from outside the SEZ. Also, since the SEZ has no history of development of geothermal resources, it is not anticipated that solar development would adversely affect the development of geothermal resources.

The production of common minerals, such as sand and gravel and mineral materials used for road construction or other purposes, might take place in areas not directly developed for solar energy production.

11.6.8.3 SEZ-Specific Design Features and Design Feature Effectiveness

No SEZ-specific design features are required. Implementing the programmatic design features described in Appendix A, Section A.2.2, as required under BLM's Solar Energy Program, would provide adequate mitigation to protect mineral resources.

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11.6.9 Water Resources

11.6.9.1 Affected Environment

The proposed Gold Point SEZ is located within the Central Nevada Desert subbasin of the Great Basin hydrologic region (USGS 2010a) and the Basin and Range physiographic province characterized by intermittent mountain ranges and desert valleys (Planert and Williams 1995). The proposed SEZ is located in the southern portion of Lida Valley, which is connected to the northern portion through narrow passes along Mount Jackson and Mount Jackson Ridge. Because a shallow surface divide separates Lida Valley and Stonewall Flat basins, Lida Valley drains south and east toward the Sarcobatus Flat area (Figure 11.6.9.1-1). Surface elevations in the proposed SEZ range from 4,831 to 5,059 ft (1,472 to 1,542 m), with a general southwest to northeast drainage pattern. Elevations in the surrounding mountains range from about 5,700 ft (1,737 m) in Slate Ridge to the south and Mount Jackson Ridge to the north, to about 9,000 ft (2,743 m) in Magruder Mountain and the Palmetto Mountains to the northwest. The climate in this region of Nevada is characterized by low humidity and precipitation, with mild winters and hot summers (Planert and Williams 1995; WRCC 2010a). The average annual precipitation ranges from 3 to 6 in. (8 to 15 cm), and the average annual snowfall ranges from 6 to 18 in. (15 to 46 cm) at the Sarcobatus and Goldfield weather stations, respectively (WRCC 2010b,c). Very little phreatic vegetation is present in the Lida Valley, so evapotranspiration is estimated to be negligible (Rush 1968), while the arid climate leads to high evaporation rates, with pan evaporations rates estimated to be about 97 in./yr (246 cm/yr) (Cowherd et al. 1988; WRCC 2010d).

11.6.9.1.1 Surface Waters (Including Drainages, Floodplains, and Wetlands)

No perennial surface water features are present in the proposed Gold Point SEZ. An unnamed intermittent stream crosses the SEZ site in a northeasterly direction and converges with Jackson Wash about 1.5 mi (2.4 km) east of the site. Jackson Wash is an intermittent stream that originates in the Montezuma Range in the northern portion of Lida Valley and enters the southern Lida Valley through the pass between Mount Jackson and Mount Jackson Ridge. It drains to the east and north toward a series of dry lakes located near the boundary of Lida Valley and Stonewall Flat about 8 mi (13 km) northeast of the site. Several ephemeral washes also drain toward the northeast across the proposed SEZ and converge to a small playa area in the northeast corner of the site (Figure 11.6.9.1-1).

A few, small lacustrine wetland areas near the boundary of Lida Valley and Stonewall Flat basin cover between about 40 and 780 acres (0.2 and 3 km^2) according to the NWI (USFWS 2009). These dry lake wetland areas have sparse vegetation with water levels mostly below the land surface for most of the year. Surface water drainage out of Lida Valley enters a large playa region in the Sarcobatus basin about 18 mi (29 km) southeast of the proposed SEZ. The playa regions in the Sarcobatus basin also coincide with the presence of lacustrine wetland areas that cover between 755 and 1,875 acres (3 and 8 km^2). Additional information regarding wetlands within the region of the proposed SEZ is presented in Section 11.6.10.1.

FIGURE 11.6.9.1-1 Surface Water Features near the Proposed Gold Point SEZ

Flood hazards have not been identified in Esmeralda County but have been mapped for Nye County, located 9 mi (14 km) east of the proposed Gold Point SEZ. In Nye County, Jackson Wash and the playa area it drains to are identified as being within a 100-year floodplain (Zone A) (FEMA 2009). It is likely that this 100-year floodplain region continues upstream along the riparian areas of Jackson Wash, which could potentially include portions of the proposed SEZ. Erosion and sedimentation are potentially concerns along the intermittent streams and ephemeral washes in the vicinity of the proposed SEZ. Additionally, temporary flooding may occur near the playa region in the northeast corner of the site during large rainfall events.

11.6.9.1.2 Groundwater

The proposed Gold Point SEZ is a part of the Lida Valley groundwater basin, which covers an area of 342,400 acres (1,386 km^2) (NDWR 2010a). The Lida Valley groundwater basin is located on the northwestern edge of the Death Valley Regional Groundwater Flow System (described in Section 11.1.9.1.2); however, it is not located over any of the regional-scale carbonate-rock aquifers associated with the carbonate rock province that covers approximately one-third of Nevada (Harrill and Prudic 1998, Faunt et al. 2004). The general hydrogeologic structure of the Lida Valley groundwater basin is that of a basin-fill aquifer containing three units: consolidated rocks, older alluvium, and younger alluvium. The consolidated rocks of the surrounding mountains and bedrock (underlying the basin-fill alluvium) consist primarily of volcanic rocks and intrusive structures, as well as some carbonate and sedimentary rocks (Rush 1968). The older and younger alluvium units of the basin-fill are composed of sand, gravel, and cobbles with interbedded silts and clays of late Tertiary and Quaternary age (Belcher et al. 2001). The thickness of the basin-fill in the Lida Valley is typically greater than 500 ft (152 m) but not more than 2,460 ft (750 m) (Faunt et al. 2004).

Historically, there has been limited groundwater development in the Lida Valley groundwater basin. In the early 1900s, groundwater from springs located in the Palmetto Mountains were pumped to supply water for mining near the town of Goldfield, 20 mi (32 km) north of the proposed SEZ; however, many of the springs in the surrounding mountains of the Lida Valley were dry or discharged less than 10 ac-ft/yr (12,300 m^3/yr) by the 1960s (Rush 1968). The primary source of available groundwater in the Lida Valley is within the basin-fill alluvium aquifers. Groundwater recharge in the Lida Valley groundwater basin is largely driven by precipitation and subsurface inflow from the Stonewall Flat region. Depending on the methods of calculation used, estimates of groundwater recharge range from 500 ac-ft/yr (616,700 m^3/yr) by precipitation and 200 ac-ft/yr (246,700 m^3/yr) by subsurface inflow (NDWR 1971), to a total recharge ranging from 50 to 420 ac-ft/yr (61,700 to 518,000 m^3/yr) (Flint et al. 2004). Groundwater discharge is driven primarily by subsurface outflow to the Sarcobatus Flat basin and has estimated as 700 ac-ft/yr (863,400 m^3/yr) (NDWR 1971). Groundwater discharge by evapotranspiration is assumed to be negligible in the Lida Valley groundwater basin, and groundwater pumping was less than 30 ac-ft/yr (37,000 m^3/yr) in 1966 (Rush 1968).

Depth to groundwater is typically about 300 to 400 ft (91 to 122 m) below the ground surface in the Lida Valley groundwater basin, and the general groundwater flow pattern is from

southwest to northeast in the vicinity of the proposed Gold Point SEZ, with an approximate slope of 0.7% in groundwater surface elevations (well numbers 372138117274001 and 373003117110101) (USGS 2010d). Groundwater flows to the northeast past the proposed SEZ, where it then converges with subsurface inflow from the Stonewall Flat basin, about 8 mi (13 km) northeast (in the vicinity of the dry lakes mentioned in Section 11.6.9.1.1), and then discharges to the south to the Sarcobatus Flat basin (Rush 1968; NDWR 1971; Faunt et al. 2004). Groundwater in the Lida Valley groundwater basin has high TDS concentrations typically greater than 500 mg/L, with sulfate concentrations greater than 250 mg/L (Rush 1968). The TDS concentrations typically increase as groundwater flows out of the Lida Valley groundwater basin an into the Sarcobatus Flat basin, where TDS concentrations are on the order of 1,000 mg/L (well number 371647117015201) (Rush 1968; USGS 2010d).

11.6.9.1.3 Water Use and Water Rights Management

In 2005, water withdrawals from surface waters and groundwater in Esmeralda County were 46,786 million ac-ft/yr (57.7 million m^3/yr), of which 9% came from surface waters and 91% came from groundwater. The largest water use categories for groundwater were irrigation and mining at 28,235 and 14,202 ac-ft/yr (34.8 million and 17.5 million m^3/yr), respectively. The remaining groundwater withdrawals were for domestic use and livestock watering (Kenny et al. 2009). The majority of the groundwater use in Esmeralda County occurs north and west of the proposed Gold Point SEZ in the Fish Lake Valley groundwater basin (NDWR 2010b); as groundwater withdrawals in the Lida Valley groundwater basin were only 30 ac-ft/yr (37,000 m^3/yr) in 1966 (Rush 1968).

All waters in Nevada are the property of the public and are subject to the laws described in Nevada Revised Statutes, Chapters 532 through 538 (available at: http://leg.state.nv.us/nrs). The NDWR, led by the State Engineer, is the agency responsible for managing both the surface water and groundwater resources. This responsibility includes overseeing water rights applications, appropriations, and interbasin transfers (NDWR 2010c). The two primary principles underlying water rights in Nevada are the prior appropriations doctrine and the concept of beneficial use. A water right establishes an appropriation amount and date such that more senior water rights have priority over newer water rights. Additionally, water rights are treated as both real and personal property, such that water rights can be transferred without affecting the land ownership (NDWR 2010c). Water rights applications (new or transfer of existing) are approved if the water is available to be appropriated, if existing water rights will not be affected, and if the proposed use is not deemed to be harmful to the public interest. If these conditions are satisfied according to the State Engineer, a proof of beneficial use of the approved water must be provided within a certain time period, and following that a certificate of appropriation is issued (BLM 2001).

The Lida Valley groundwater basin in not a designated groundwater; thus, there are no specified beneficial uses set by the NDWR (NDWR 1974). The perennial yield of the Lida Valley groundwater basin is set at 350 ac-ft/yr (431,700 m^3/yr), and current water rights total 76 ac-ft/yr (93,700 m^3/yr). This water is being used for mining, stock water, and municipal supply (NDWR 2010a). Solar energy developers would have to submit applications for new

groundwater withdrawals or transfer of existing water rights to the NDWR according to the process described previously.

11.6.9.2 Impacts

Potential impacts on water resources related to utility-scale solar energy development include direct and indirect impacts on surface waters and groundwater. Direct impacts occur at the place of origin and at the time of the proposed activity, while indirect impacts occur away from the place of origin or later in time. Impacts on water resources considered in this analysis are the result of land disturbance activities (construction, final developed site plan, as well as off-site activities such as road and transmission line construction) and water use requirements for solar energy technologies during the four project phases: site characterization, construction, operations, and decommissioning/reclamation. Both land disturbance and consumptive water use activities can affect groundwater and surface water flows, cause drawdown of groundwater surface elevations, modify natural drainage pathways, obstruct natural recharge zones, and alter surface water-wetland-groundwater connectivity. Water quality can also be degraded through the generation of wastewater, chemical spills, increased erosion and sedimentation, and increased salinity (e.g., by the excessive withdrawal from aquifers).

11.6.9.2.1 Land Disturbance Impacts on Water Resources

Impacts related to land disturbance activities are common to all utility-scale solar energy facilities and are described in more detail for the four phases of development in Section 5.9.1. These impacts will be minimized through the implementation of programmatic design features described in Appendix A, Section A.2.2. Land disturbance activities should be minimized in the vicinity of the unnamed intermittent stream and the several ephemeral washes draining across the site. During large storm events, these intermittent streams have the potential to flood and cause sedimentation and erosion issues. Additionally, alterations to these intermittent and ephemeral stream features could have adverse impacts on sedimentation and erosion to the downstream playa region in the northeast corner of the proposed SEZ, as well as off-site in Jackson Wash.

11.6.9.2.2 Water Use Requirements for Solar Energy Technologies

Analysis Assumptions

A detailed description of the water use assumptions for the four utility-scale solar energy technologies (parabolic trough, power tower, dish engine, and PV systems) is presented in Appendix M. Assumptions regarding water use calculations specific to the proposed Gold Point SEZ include the following:

- On the basis of a total area of 4,810 acres (19 km^2), it is assumed that one solar project would be constructed during the peak construction year;

- Water needed for making concrete would come from an off-site source;

- The maximum land disturbance for an individual solar facility during the peak construction year is 3,000 acres (12 km^2);

- Assumptions on individual facility size and land requirements (Appendix M), along with the assumed number of projects and maximum allowable land disturbance, results in the potential to disturb of up to 62% of the total SEZ area during the peak construction year; and

- Water use requirements for hybrid cooling systems are assumed to be on the same order of magnitude as those for dry-cooling systems (see Section 5.9.2.1).

Site Characterization

During site characterization, water would be used mainly for controlling fugitive dust and the workforce potable water supply. Impacts on water resources during this phase of development are expected to be negligible since activities would be limited in area, extent, and duration; water needs could be met by trucking water in from an off-site source.

Construction

During construction, water would be used mainly for controlling fugitive dust and the workforce potable water supply. Because there are no significant surface water bodies on the proposed Gold Point SEZ, the water requirements for construction activities could be met by either trucking water to the site or by using on-site groundwater resources.

Water requirements for dust suppression and potable water supply during construction, shown in Table 11.6.9.2-1, could be as high as 1,707 ac-ft (2.1 million m^3) for the peak construction year. The assumptions underlying these estimates for each solar energy technology are described in Appendix M. The total water use estimates for the peak construction year are on the order of 3 to 5 times greater than the perennial yield of the Lida Valley groundwater basin. Thus, at least a portion of the water supply would have to come from an off-site source or be transferred from an adjacent basin (if unappropriated groundwater is available in adjacent basins), which would have to be negotiated with the NDWR. The effects of groundwater withdrawals on groundwater surface elevations in the Lida Valley would have to be assessed during the site characterization phase. In addition, the generation of up to 74 ac-ft (91,300 m^3) of sanitary wastewater during the peak construction year would have to be treated either on-site or sent to an off-site facility.

TABLE 11.6.9.2-1 Estimated Water Requirements, by Technology, during the Peak Construction Year for the Proposed Gold Point SEZ

Activity	Parabolic Trough	Power Tower	Dish Engine	PV
Water use requirements[a]				
Fugitive dust control (ac-ft)[b,c]	1,108	1,662	1,662	1,662
Potable supply for workforce (ac-ft)	74	45	19	9
Total water use requirements (ac-ft)	1,182	1,707	1,681	1,671
Wastewater generated				
Sanitary wastewater (ac-ft)	74	45	19	9

[a] Assumptions of water use for fugitive dust control, potable supply for workforce, and wastewater generation are presented in Appendix M.

[b] Fugitive dust control estimation assumes a local pan evaporation rate of 97 in./yr (246 cm/yr) (Cowherd et al. 1988; WRCC 2010d).

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

Operations

During operations, water would be required for mirror/panel washing, the workforce potable water supply, and cooling (parabolic trough and power tower only) (Table 11.6.9.2-2). Water needs for cooling would be a function of the type of cooling used (dry, hybrid, wet). Further refinements to water requirements for cooling would result from the percentage of time that the option was employed (30 to 60% range assumed) and the power of the system. The differences between the water requirements reported in Table 11.6.9.2-2 for the parabolic trough and power tower technologies are attributable to the assumptions of acreage per megawatt. As a result, the water usage for the more energy-dense parabolic trough technology is estimated to be almost twice as great as that for the power tower technology.

At full build-out capacity, water needs for mirror/panel washing are estimated to range from 21 to 385 ac-ft/yr (25,900 to 474,900 m^3/yr) and the workforce potable water supply from 1 to 11 ac-ft/yr (1,234 to 13,600 m^3/yr). The maximum total water usage during normal operation at full build-out capacity would be greatest for those technologies using the wet-cooling option and is estimated to be as high as 11,555 ac-ft/yr (14.3 million m^3/yr). Water usage for dry-cooling systems would be as high as 1,166 ac-ft/yr (1.4 million m^3/yr), approximately a factor of 10 times less that the wet-cooling option. Non-cooled technologies, dish engine and PV systems, require substantially less water at full build-out capacity at 219 ac-ft/yr (270,100 million m^3/yr) for dish engine and 22 ac-ft/yr (27,100 million m^3/yr) for PV (Table 11.6.9.2-2). Operations would produce up to 11 ac-ft/yr (13,600 m^3/yr) of sanitary wastewater. In addition, for wet-cooled technologies, 121 to 219 ac-ft/yr (149,300 to 270,100 million m^3/yr) of cooling system blowdown water would need to be treated either on- or off-site. Any on-site treatment of wastewater would have to ensure that treatment ponds are effectively lined in order to prevent any groundwater contamination.

TABLE 11.6.9.2-2 Estimated Water Requirements, by Technology, during Operations at the Proposed Gold Point SEZ

Activity	Parabolic Trough	Power Tower	Dish Engine	PV
Full build-out capacity (MW)[a,b]	770	428	428	428
Water use requirements				
Mirror/panel washing (ac-ft/yr)[c,d]	385	214	214	21
Potable supply for workforce (ac-ft/yr)	11	5	5	1
Dry cooling (ac-ft/yr)[e]	154–770	86–428	NA[f]	NA
Wet cooling (ac-ft/yr)[e]	3,463–11,159	1,924–6,200	NA	NA
Total water use requirements				
Non-cooled technologies (ac-ft/yr)	NA	NA	219	22
Dry-cooled technologies (ac-ft/yr)	550–1,166	305–647	NA	NA
Wet-cooled technologies (ac-ft/yr)	3,859–11,555	2,143–6,419	NA	NA
Wastewater generated				
Blowdown (ac-ft/yr)[g]	219	121	NA	NA
Sanitary wastewater (ac-ft/yr)	11	5	5	1

[a] Land area for parabolic trough was estimated at 5 acres/MW (0.02 km^2/MW); land area for the power tower, dish engine, and PV technologies was estimated at 9 acres/MW (0.04 km^2/MW).

[b] Water needs are linearly related to power. Water usage for any other size project can be estimated by using multipliers provided in Table M.9-2 (Appendix M).

[c] Value assumes a usage rate of 0.5 ac-ft/yr/MW for mirror washing for parabolic trough, power tower, and dish engine technologies and a rate of 0.05 ac-ft/yr/MW for panel washing for PV systems.

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

[e] Dry-cooling value assumes 0.2 to 1.0 ac-ft/yr per MW and wet-cooling value assumes 4.5 to 14.5 ac-ft/yr per MW (range in these values represents 30 and 60% operating times) (DOE 2009).

[f] NA = not applicable.

[g] Value scaled from 250-MW Beacon Solar project with an annual discharge of 44 gpm (167 L/min) (AECOM 2009). Blowdown estimates are relevant to wet cooling only.

Groundwater is the primary water resource available for solar energy development at the proposed Gold Point SEZ, and the NDWR has set the perennial yield for the Lida Valley groundwater basin at 350 ac-ft/yr (431,700 m^3/yr). Estimated water needs for technologies using wet cooling are at least a factor of 10 greater than the perennial yield (total available water) of the basin, so wet cooling is not feasible at the proposed Gold Point SEZ. Technologies using dry cooling have water use estimates on the order of the perennial yield to about 3 times the perennial yield. It is doubtful that a full build-out scenario using dry-cooling technologies could be supported with the available groundwater supplies. However, water conservation measures and operational aspects (e.g. 30% operating time) could lower the water use requirements of dry-cooling technologies. Full build-out operations of dish engine and PV technologies could be supported by groundwater resources in the Lida Valley groundwater basin and would not require the transfer of any existing groundwater rights.

The water quality of groundwater sources would have to be assessed during the site characterization phase. Water used for the workforce potable water supply would have to meet or be treated to comply with water quality standards described in the Nevada Administrative Code (445A.453-445A.455).

Decommissioning/Reclamation

During decommissioning/reclamation, all surface structures associated with the solar project would be dismantled, and the site would be reclaimed to its preconstruction state. Activities and water needs during this phase would be similar to those during the construction phase (dust suppression and potable supply for workers) and may also include water to establish vegetation in some areas. However, the total volume of water needed is expected to be less than during the construction phase. Because quantities of water needed during the decommissioning/ reclamation phase would be less than those for construction, impacts on surface and groundwater resources also would be less.

11.6.9.2.3 Off-Site Impacts: Roads and Transmission Lines

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. The extent of the impacts on water resources is proportional to the amount and location of land disturbance needed to connect the proposed SEZ to major roads and existing transmission lines. The proposed Gold Point SEZ is located adjacent to existing roads and 22 mi (35 km) from existing transmission lines, as described in Section 11.6.1.2. Impacts to water resources from the construction of transmission lines are expected to be negligible with the implementation of programmatic design features described in Appendix A, Section A.2.2.

11.6.9.2.4 Summary of Impacts on Water Resources

The impacts on water resources associated with developing solar energy at the proposed Gold Point SEZ are related to land disturbance effects to the natural hydrology, water quality concerns, and water use requirements for the various solar energy technologies. Land disturbance activities can cause localized erosion and sedimentation issues, as well as alter groundwater recharge and discharge processes. The unnamed intermittent stream and ephemeral washes within the proposed SEZ, along with the playa area in the northeast corner, may be in a 100-year floodplain as they drain toward Jackson Wash, which has been identified as being within a 100-year floodplain in the neighboring Nye County, located 9 mi (14 km) east of the site. The 100-year floodplain would be identified during the site characterization phase, and solar energy development should be excluded from areas of the proposed SEZ within the 100-year floodplain.

Impacts relating to water use requirements vary depending on the type of solar technology built and, for technologies using cooling systems, the type of cooling used (wet, dry,

or hybrid). Groundwater is the primary water resource available to solar energy facilities in the proposed Gold Point SEZ. Water requirements during the construction phase are greater than the perennial yield of the Lida Valley groundwater basin for all technologies. Given the limited temporal extent of construction activities, off-site water sources (including water transfers from adjacent basins) would need to be considered to meet peak year construction water use requirements. During the operations phase, the water use requirements for technologies using wet cooling are at least a factor of 10 greater than the perennial yield for the Lida Valley groundwater basin, so wet cooling would not be feasible for the full build-out scenario. Water use estimates for dry cooling are on the same order of magnitude as the perennial yield of the Lida Valley groundwater basin or greater, so water conservation measures would need to be implemented to reduce water needs. Dish engine and PV technologies have full build-out water use requirements that can be supported by unallocated water rights in the Lida Valley groundwater basin, so these technologies are the preferred solar technologies for potential development at the proposed Gold Point SEZ based on water use requirements.

11.6.9.3 SEZ-Specific Design Features and Design Feature Effectiveness

The program for solar energy development on BLM-administered lands will require the programmatic design features given in Appendix A, Section A.2.2, to be implemented, thus mitigating some impacts on water resources. Design features would focus on coordinating with federal, state, and local agencies that regulate the use of water resources to meet the requirements of permits and approvals needed to obtain water for development, and conducting hydrological studies to characterize the aquifer from which groundwater would be obtained (including drawdown effects, if a new point of diversion is created). The greatest consideration for mitigating water impacts would be in the selection of solar technologies. The mitigation of impacts would be best achieved by selecting technologies with low water demands.

Design features specific to the proposed Gold Point SEZ include the following:

- Water resource analysis indicates that wet-cooling options would not be feasible; other technologies should incorporate water conservation measures;

- Land disturbance activities should minimize impacts to the unnamed intermittent stream, the playa area in the northeast corner, and ephemeral washes on site;

- Siting of solar facilities and construction activities should avoid any areas identified as within a 100-year floodplain or jurisdictional waters;

- Groundwater supplies during the construction and operations phases would need to be secured through coordination of the NDWR in terms of obtaining groundwater rights with in the Lida Valley groundwater basin, and potentially from off-site sources and adjacent groundwater basins for the construction phase;

- Stormwater management plans and BMPs should comply with standards developed by the Nevada Division of Environmental Protection (NDEP 2010);

- Groundwater monitoring and production wells should be constructed in accordance with state standards (NDWR 2006); and

- Water for potable uses would have to meet or be treated to meet water quality standards in accordance with the *Nevada Administrative Code* (445A.453–445A.455).

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11.6.10 Vegetation

This section addresses vegetation that could occur or is known to occur within the potentially affected area of the proposed Gold Point SEZ. The affected area considered in this assessment includes the areas of direct and indirect effects. The area of direct effects is defined as the area that would be physically modified during project development (i.e., where ground-disturbing activities would occur) and includes the SEZ and a 250-ft (76-m) wide portion of an assumed transmission line corridor. The area of indirect effects was defined as the area within 5 mi (8 km) of the SEZ boundary and within the 1-mi (1.6-km) wide assumed transmission line corridor, where ground-disturbing activities would not occur but that could be indirectly affected by activities in the area of direct effects.

Indirect effects considered in the assessment include effects from surface runoff, dust, and accidental spills from the SEZ, but do not include ground-disturbing activities. The potential degree of indirect effects would decrease with increasing distance from the SEZ. This area of indirect effects was identified on the basis of professional judgment and was considered sufficiently large to bound the area that would potentially be subject to indirect effects. The affected area is the area bounded by the areas of direct and indirect effects. These areas are defined and the impact assessment approach is described in Appendix M.

11.6.10.1 Affected Environment

The proposed Gold Point SEZ is located primarily within the Tonopah Basin Level IV ecoregion, which primarily supports sparse shadscale (*Atriplex confertifolia*) communities on broad valleys, hills, bajadas, and alluvial fans (Bryce et al. 2003). Additional commonly occurring shrubs in this ecoregion include bud sagebrush (*Picrothamnus desertorum*), spiny hopsage (*Grayia spinosa*), seepweed (*Suaeda* sp.), fourwing saltbush (*Atriplex canescens*), spiny menodora (*Menodora spinescens*), Nevada ephedra (*Ephedra nevadensis*), littleleaf horsebrush (*Tetradymia glabrata*), Douglas rabbitbrush (*Chrysothamnus viscidiflorus*), and winterfat (*Krascheninnikovia lanata*), which, along with shadscale, often co-dominate in highly diverse mosaics. Warm season grasses, such as Indian rice grass (*Achnatherum hymenoides*) and galleta grass (*Pleuraphis jamesii*), occur in the understory. Stands of inland saltgrass (*Distichlis spicata*) and alkali sacaton (*Sporobolus airoides*) also occur. Bailey greasewood (*Sarcobatus baileyi*) and Shockley wolfberry (*Lycium* sp.) are widespread and often co-dominate on lower alluvial slopes in this ecoregion. Black greasewood (*Sarcobatus vermiculatus*) occurs in saline bottoms. Springs and sporadic precipitation in foothills provide surface water sources.

The area surrounding the SEZ consists of a mosaic of the Tonopah Basin and the Tonopah Sagebrush Foothills Level IV ecoregion. This ecoregion supports black sagebrush (*Artemisia nova*) and Mojave species such as blackbrush (*Coleogyne ramosissima*), Joshua tree (*Yucca brevifolia*), and cholla (*Cylindropuntia* sp.) on rocky substrates. The Tonopah Basin and Tonopah Sagebrush Foothills ecoregions lie within the Central Basin and Range Level III ecoregion, described in Appendix , I, and are part of the Great Basin desertscrub biome. Annual precipitation in the vicinity of the SEZ is low, averaging about 6.1 in. (15.4 cm) at Goldfield, Nevada (see Section 11.6.13).

Land cover types described and mapped under the SWReGAP (USGS 2005a) were used to evaluate plant communities in and near the SEZ. Each cover type encompasses a range of similar plant communities. Land cover types occurring within the potentially affected area of the proposed Gold Point SEZ are shown in Figure 11.6.10.1-1. Table 11.6.10.1-1 lists the surface area of each cover type within the potentially affected area.

Inter-Mountain Basins Mixed Salt Desert Scrub is the predominant cover type within the proposed Gold Point SEZ. Additional cover types within the SEZ are given in Table 11.6.10.1-1. During an August 2009 visit to the site, shadscale, greasewood, fourwing saltbush, winterfat, spiny horsebrush (*Tetradymia* sp.), and Indian ricegrass were the dominant species observed in the desert scrub communities throughout most of the SEZ. Joshua tree (*Yucca brevifolia*) was sparse in the northwest area of the SEZ and absent elsewhere. Joshua tree density increased south and southeast of the SEZ, within the area of indirect effects. Cacti observed on the SEZ included beavertail (*Opuntia basilaris*). Sensitive habitats on the SEZ include riparian, desert dry wash, and playa habitats. The area has a history of livestock grazing, and the plant communities on the SEZ have likely been affected by grazing.

The indirect effects area, including the area within 5 mi (8 km) around the SEZ and transmission line corridor, includes 16 cover types, which are listed in Table 11.6.10.1-1. The predominant cover type in the indirect effects area is Inter-Mountain Basins Mixed Salt Desert Scrub.

There are no wetlands mapped by the NWI within the SEZ or indirect effects area (USFWS 2009). NWI maps are produced from high-altitude imagery and are subject to uncertainties inherent in image interpretation (USFWS 2009). Small areas identified as Inter-Mountain Basins Playa occur in the northeastern portion of the SEZ, along with scattered areas of greasewood flat. An unnamed intermittent stream crosses the SEZ from west to east and supports small areas of riparian plant communities. Numerous desert dry washes occur within the SEZ. The dry washes typically do not support wetland or riparian habitats, but many support communities of shrubs, including rabbitbrush (*Chrysothamnus/Ericameria* sp.). The dry washes, greasewood flats, and playas typically contain water for short periods during or following precipitation events. The entire SEZ is within the watershed of Jackson Wash, which supports riparian communities downstream of the SEZ. Springs occur in the vicinity of the SEZ, primarily to the west; however, discharge from these springs is generally low (see Section 11.6.9).

The State of Nevada maintains an official list of weed species that are designated noxious species. Table 11.6.10.1-2 provides a summary of the noxious weed species regulated in Nevada that are known to occur in Esmeralda County (USDA 2010, Creech et al. 2010), which includes the proposed Gold Point SEZ. Russian thistle (*Salsola* sp.), a non-native species observed to occur within much of the SEZ in August 2009, is not included in this table.

The NDA classifies noxious weeds into one of three categories (NDA 2010):

- "Category A: Weeds not found or limited in distribution throughout the state; actively excluded from the state and actively eradicated wherever found; actively eradicated from nursery stock dealer premises; control required by the state in all infestations."

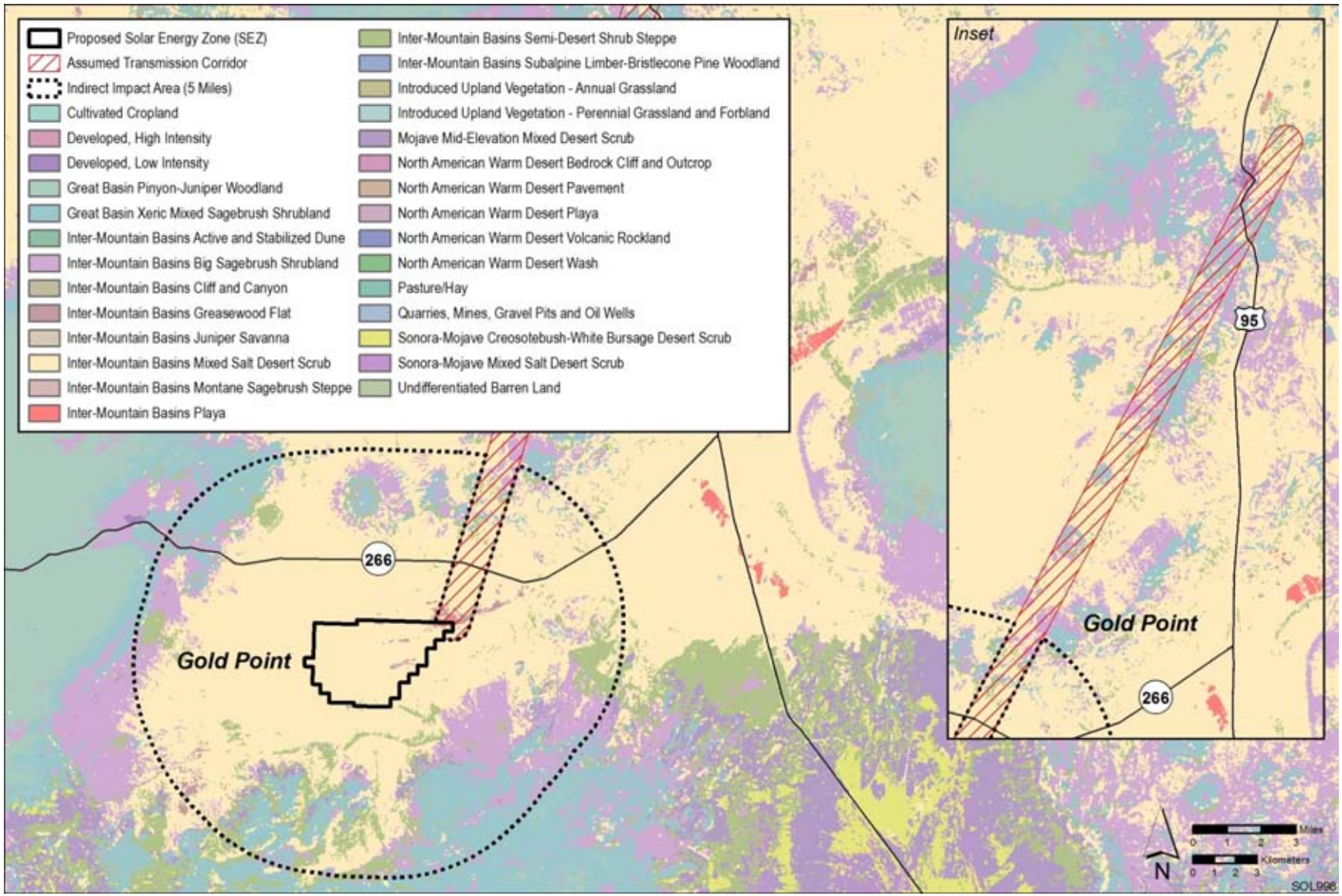

FIGURE 11.6.10.1-1 Land Cover Types within the Proposed Gold Point SEZ (Source: USGS 2004)

TABLE 11.6.10.1-1 Land Cover Types within the Potentially Affected Area of the Proposed Gold Point SEZ and Potential Impacts

Land Cover Type[a]	Area of Cover Type Affected (acres)[b] Within SEZ (Direct Effects)[c]	Transmission Line (Direct Effects)[d]	Corridor and Outside SEZ (Indirect Effects)[e]	Overall Impact Magnitude[f]
Inter-Mountain Basins Mixed Salt Desert Scrub: Generally consists of open shrublands that include at least one species of *Atriplex*, along with other shrubs. Perennial grasses dominate a sparse to moderately dense herbaceous layer.	4,641 acres[g] (0.5%, 0.6%)	397 acres (<0.1%)	60,242 acres (3.5%)	Small
Inter-Mountain Basins Greasewood Flat: Dominated or codominated by greasewood (*Sarcobatus vermiculatus*) and generally occurring in areas with saline soils, a shallow water table, and intermittent flooding, although remaining dry for most growing seasons. This community type generally occurs near drainages or around playas. These areas may include, or may be codominated by, other shrubs, and may include a graminoid herbaceous layer.	106 acres (0.6%, 1.1%)	8 acres (<0.1%)	582 acres (1.1%)	Small
Inter-Mountain Basins Playa: Playa habitats are intermittently flooded and generally barren or sparsely vegetated. Depressions may contain small patches of grass, and sparse shrubs may occur around playa margins.	29 acres (0.1%, 0.1%)	2 acres (<0.1%)	46 acres (0.1%)	Small
Inter-Mountain Basins Semi-Desert Shrub Steppe: Generally consists of perennial grasses with an open shrub and dwarf shrub layer.	23 acres (<0.1%, <0.1%)	32 acres (<0.1%)	8,122 acres (2.5%)	Small
Inter-Mountain Basins Big Sagebrush Shrubland: Dominated by basin big sagebrush (*Artemisia tridentata tridentata*), Wyoming big sagebrush (*Artemisia tridentata wyomingensis*), or both. Other shrubs may be present. Perennial herbaceous plants are present but not abundant.	2 acres (<0.1%, <0.1%)	140 acres (<0.1%)	14,299 acres (3.5%)	Small

TABLE 11.6.10.1-1 (Cont.)

Land Cover Type[a]	Area of Cover Type Affected (acres)[b] Within SEZ (Direct Effects)[c]	Transmission Line (Direct Effects)[d]	Corridor and Outside SEZ (Indirect Effects)[e]	Overall Impact Magnitude[f]
Great Basin Xeric Mixed Sagebrush Shrubland: Generally occurs on level plains, slopes, and ridges. The dominant shrub species are black sagebrush (*Artemisia nova*) or, at higher elevations, little sagebrush (*Artemisia arbuscula*), and co-dominants may be Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) or yellow rabbitbrush (*Chrysothamnus viscidiflorus*). Other shrub species may also be present as well as sparse perennial bunchgrasses.	0 acres	76 acres (<0.1%)	12,739 acres (2.9%)	Small
Developed, Open Space – Low Intensity: Includes housing, parks, golf courses, and other areas planted in developed settings. Impervious surfaces compose up to 49 percent of the total land cover.	0 acres	4 acres (0.1%)	90 acres (1.9%)	Small
Barren Lands, Nonspecific: Includes a variety of barren areas, generally with less than 15% cover of vegetation.	0 acres	3 acres (0.1%)	57 acres (1.6%)	Small
Inter-Mountain Basins Cliff and Canyon: Includes barren and sparsely vegetated (generally <10% plant cover) steep cliff faces, narrow canyons, small rock outcrops, and scree and talus slopes. Composed of widely scattered coniferous trees and a variety of shrubs.	0 acres	2 acres (<0.1%)	357 acres (1.3%)	Small
Developed, Medium-High Intensity: Includes housing and commercial/industrial development. Impervious surfaces compose 50 to 100% of the total land cover.	0 acres	1 acre (0.2%)	9 acres (2.9%)	Small
Great Basin Pinyon-Juniper Woodland: Occurs on low-elevation slopes and ridges. Singleleaf pinyon (*Pinus monophylla*), Utah juniper (*Juniperus osteosperma*), or both are the dominant species, generally associating with curl-leaf mountain mahogany (*Cercocarpus ledifolius*). Understory species include shrubs and grasses.	0 acres	<1 acre (<0.1%)	79 acres (<0.1%)	Small

TABLE 11.6.10.1-1 (Cont.)

Land Cover Type[a]	Area of Cover Type Affected (acres)[b]: Within SEZ (Direct Effects)[c]	Transmission Line (Direct Effects)[d]	Corridor and Outside SEZ (Indirect Effects)[e]	Overall Impact Magnitude[f]
Inter-Mountain Basins Big Sagebrush Steppe: Dominated by basin big sagebrush (*Artemisia tridentata tridentata*), Wyoming big sagebrush (*Artemisia tridentata wyomingensis*), big sagebrush (*Artemisia tridentata xericensis*), threetip sagebrush (*Artemisia tripartita tripartita*), or antelope bitterbrush (*Purshia tridentata*), or a combination of these species. Other shrubs may be present. Perennial grasses are often abundant. The distribution of shrubs may be patchy, with grassland predominating.	0 acres	<1 acre (<0.1%)	6 acres (1.8%)	Small
Mojave Mid-Elevation Mixed Desert Scrub: The vegetation composition is quite variable. Dominant species include shrubs, forbs, and grasses and may include *Yucca* spp.	0 acres	<1 acre (<0.1%)	1,303 acres (0.4%)	Small
Introduced Upland Vegetation – Annual and Perennial Grassland: Dominated by non-native annual and perennial grass species.	0 acres	<1 acre (<0.1%)	45 acres (0.6%)	Small
Inter-Mountain Basins Semi-Desert Grassland: Consists of perennial bunchgrasses as dominants or co-dominants. Scattered shrubs or dwarf shrubs may also be present.	0 acres	<1 acre (<0.1%)	15 acres (0.3%)	Small

TABLE 11.6.10.1-1 (Cont.)

Land Cover Type[a]	Area of Cover Type Affected (acres)[b] Within SEZ (Direct Effects)[c]	Transmission Line (Direct Effects)[d]	Corridor and Outside SEZ (Indirect Effects)[e]	Overall Impact Magnitude[f]
Sonora-Mojave Creosotebush-White Bursage Desert Scrub: Occurs in broad valleys, lower bajadas, plains, and low hills in the Mojave and Sonoran deserts. Shrubs form a sparse to moderately dense cover (2 to 50%), although the ground surface may be mostly barren. The dominant species are typically creosotebush (*Larrea tridentata*) and white bursage (*Ambrosia dumosa*). Other shrubs, dwarf-shrubs, and cacti may also be dominant or form sparse understories. Herbaceous species are typically sparse, but may be seasonally abundant.	0 acres	0 acres	80 acres (<0.1%)	Small

[a] Land cover descriptions are from USGS (2005a). Full descriptions of land cover types, including plant species, can be found in Appendix I.

[b] Area in acres, determined from USGS (2004).

[c] Includes the area of the cover type within the SEZ, the percentage that area represents of all occurrences of that cover type within the SEZ region (i.e., a 50-mi [80-km] radius from the center of the SEZ), and the percentage that area represents of all occurrences of that cover type on BLM lands within the SEZ region. The SEZ region intersects portions of Nevada and California.

[d] For transmission development, direct effects were estimated within a 22-mi (35-km) long, 250-ft (76-m) wide transmission ROW from the SEZ to the nearest existing line. Direct impacts within this area were determined from the proportion of the cover type within the 1-mi (1.6-km) wide transmission corridor. Impacts are for the area of the cover type within the assumed ROW, and the percentage that area represents of all occurrences of that cover type within the SEZ region.

[e] Area of indirect effects was assumed to be the area adjacent to the SEZ within 5 mi (8 km) of the SEZ boundary and within the 1-mi (1.6-km) wide assumed transmission line corridor, where ground-disturbing activities would not occur. Indirect effects include effects from surface runoff, dust, and other factors from projects. The potential degree of indirect effects would decrease with increasing distance from the SEZ. Includes the area of the cover type within the area of indirect effects and the percentage that area represents of all occurrences of that cover type within the SEZ region. The area of indirect effects occurs only in Nevada.

[f] 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; (3) *large*: >10% of a cover type would be lost.

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

TABLE 11.6.10.1-2 Designated Noxious Weeds of Nevada Occurring in Esmeralda County

Common Name	Scientific Name	Category
Hoary cress/Whitetop[a]	*Cardaria* spp.	C
Johnsongrass[a]	*Sorghum halepense*	C
Musk thistle[b]	*Carduus nutans*	B
Perennial pepperweed[a]	*Lepidium latifolium*	C
Poison hemlock[a]	*Conium maculatum*	C
Puncture vine	*Tribulus terrestris*	C
Russian knapweed[a]	*Acroptilon repens*	B
Saltcedar[a,b]	*Tamarix* spp.	C
Scotch thistle[a]	*Onopordium acanthium*	B
Yellow toadflax[a]	*Linaria vulgaris*	A

[a] Creech et al. (2010).

[b] USDA (2010).

Source: NDA (2010).

- "Category B: Weeds established in scattered populations in some counties of the state; actively excluded where possible, actively eradicated from nursery stock dealer premises; control required by the state in areas where populations are not well established or previously unknown to occur."

- "Category C: Weeds currently established and generally widespread in many counties of the state; actively eradicated from nursery stock dealer premises; abatement at the discretion of the state quarantine officer."

11.6.10.2 Impacts

The construction of solar energy facilities within the proposed Gold Point SEZ would result in direct impacts on plant communities due to the removal of vegetation within the facility footprint during land-clearing and land-grading operations. Approximately 80% of the SEZ (3,848 acres [15.6 km^2]) would be expected to be cleared with full development of the SEZ. The plant communities affected would depend on facility locations and could include any of the communities occurring on the SEZ. Therefore, for this analysis, all the area of each cover type within the SEZ is considered to be directly affected by removal with full development of the SEZ.

Indirect effects (e.g., caused by surface runoff or dust from the SEZ) have the potential to degrade affected plant communities and to reduce biodiversity by promoting the decline or elimination of species sensitive to disturbance. Indirect effects can also cause an increase in disturbance-tolerant species or invasive species. High impact levels could result in the elimination of a community or the replacement of one community type by another. The proper

implementation of programmatic design features, however, would reduce indirect effects to a minor or small level of impact.

Possible impacts from solar energy facilities on vegetation within the SEZ, are described in more detail in Section 5.10.1. Any such impacts would be minimized through the implementation of required design features described in Appendix A, Section A.2.2, and through any additional mitigation applied. Section 11.6.10.2.3, below, identifies design features of particular relevance to the proposed Gold Point SEZ.

11.6.10.2.1 Impacts on Native Species

The impacts of construction, operation, and decommissioning were considered small if the impact affected a relatively small proportion (≤1%) of the cover type in the SEZ region (within 50 mi [80 km] of the center of the SEZ); moderate if it could affect an intermediate proportion (>1 but ≤10%) of a cover type; and large if it could affect greater than 10% of a cover type.

Solar facility construction and operation in the proposed Gold Point SEZ would primarily affect communities of the Inter-Mountain Basins Mixed Salt Desert Scrub cover type. Additional cover types that would be affected within the SEZ include Inter-Mountain Basins Greasewood Flat, Inter-Mountain Basins Playa, Inter-Mountain Basins Semi-Desert Shrub Steppe, and Inter-Mountain Basins Big Sagebrush Shrubland. Additional cover types that would be affected only by the assumed transmission line include Great Basin Xeric Mixed Sagebrush Shrubland, Developed, Open Space—Low Intensity, Barren Lands, Nonspecific, Inter-Mountain Basins Cliff and Canyon, Developed, Medium-High Intensity, Great Basin Pinyon-Juniper Woodland, Inter-Mountain Basins Big Sagebrush Steppe, Mojave Mid-Elevation Mixed Desert Scrub, Introduced Upland Vegetation—Annual and Perennial Grassland, Inter-Mountain Basins Semi-Desert Grassland, and Sonora-Mojave Creosotebush-White Bursage Desert Scrub. Introduced Upland Vegetation—Annual and Perennial Grassland, Developed, Open Space—Low Intensity, and Developed, Medium-High Intensity cover types would likely have relatively minor populations of native species. Table 11.6.10.1-1 summarizes the potential impacts on land cover types resulting from solar energy facilities in the proposed Gold Point SEZ. While these cover types are relatively common in the SEZ region, several cover types within the transmission line corridor are relatively uncommon, representing less than 1% of the land area within the SEZ region: Inter-Mountain Basins Cliff and Canyon (0.5%), Inter-Mountain Basins Semi-Desert Grassland (0.09%), Barren Lands, Non-specific (0.07%), and Inter-Mountain Basins Big Sagebrush Steppe (0.006%). The construction, operation, and decommissioning of solar projects within the proposed Gold Point SEZ would result in small impacts on all cover types in the affected area. Playa, riparian, and desert dry wash are important sensitive habitats in the SEZ and corridor.

Because of the arid conditions, reestablishment of desert scrub communities in temporarily disturbed areas would likely be very difficult and might require extended periods of time. In addition, noxious weeds could become established in disturbed areas and colonize adjacent undisturbed habitats, thus reducing restoration success and potentially resulting in

widespread habitat degradation. Cryptogamic soil crusts occur in many of the shrubland communities in the region and likely occur on the SEZ. Damage to these crusts, by the operation of heavy equipment or other vehicles, can alter important soil characteristics, such as nutrient cycling and availability, and affect plant community characteristics (Lovich and Bainbridge 1999).

The deposition of fugitive dust from large areas of disturbed soil onto habitats outside a solar project area could result in reduced productivity or changes in plant community composition. Fugitive dust deposition could affect plant communities of each of the cover types occurring within the area of indirect affects identified in Table 11.6.10.1-1.

Communities associated with riparian habitats, playa habitats, greasewood flats communities, desert dry wash habitats, or other periodically flooded areas within solar projects or the transmission line corridor could be directly affected by ground-disturbing activities. Similar habitats downgradient from ground-disturbing activities could be indirectly affected. Surface drainage in the northern portion of the SEZ is directed toward playa habitats. The entire SEZ is within the watershed of Jackson Wash, which supports riparian communities downstream of the SEZ. Site-clearing and -grading could disrupt surface water flow patterns, resulting in changes in the frequency, duration, depth, or extent of inundation or soil saturation; could potentially alter plant communities within riparian or playa habitats or along Jackson Wash, including occurrences outside of the SEZ; and could affect community function. Increases in surface runoff from a solar energy project site or transmission line could also affect hydrologic characteristics of these communities. The introduction of contaminants into these habitats could result from spills of fuels or other materials used on a project site. Soil disturbance could result in sedimentation in these areas, which could degrade or eliminate sensitive plant communities. Alteration of surface drainage patterns or hydrology could also adversely affect downstream desert dry wash communities. Vegetation within these communities could be lost by erosion or desiccation.

Although the use of groundwater within the Gold Point SEZ for technologies with high water requirements, such as wet-cooling systems, may be unlikely, groundwater withdrawals for such systems could reduce groundwater elevations. Communities that depend on accessible groundwater, such as those associated with springs in the Lida Valley groundwater basin, or in other hydrologically connected basins, could become degraded or lost as a result of lowered groundwater levels. The potential for impacts on springs would need to be evaluated by project-specific hydrological studies.

11.6.10.2.2 Impacts from Noxious Weeds and Invasive Plant Species

On February 8, 1999, the President signed E.O. 13112, "Invasive Species," which directs federal agencies to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts of invasive species (*Federal Register*, Volume 64, page 61836, Feb. 8, 1999). Potential impacts of noxious weeds and invasive plant species resulting from solar energy facilities are described in Section 5.10.1. Despite required design features to prevent the spread of noxious weeds, project disturbance

could potentially increase the prevalence of noxious weeds and invasive species in the affected area of the proposed Gold Point SEZ, such that weeds could be transported into areas that were previously relatively weed-free, which could result in reduced restoration success and possible widespread habitat degradation. Species designated as noxious weeds in Nevada and known to occur in Esmeralda County are listed in Table 11.6.10.1-2. Less than 1 acre (<0.004 km^2) of Introduced Upland Vegetation—Annual and Perennial Grassland occurs within the direct effects area of the assumed transmission line and approximately 45 acres (0.2 km^2) occurs in the indirect effects area of the SEZ.

Past or present land uses may affect the susceptibility of plant communities to the establishment of noxious weeds and invasive species. Existing roads, transmission lines, and recreational OHV use within the affected area of the Gold Point SEZ would also likely contribute to the susceptibility of plant communities to the establishment and spread of noxious weeds and invasive species. Disturbed areas may contribute to the establishment of noxious weeds and invasive species. Approximately 1 acre (0.004 km^2) of Developed, Medium-High Intensity occurs within the direct effects area of the assumed transmission line and 9 acres (0.04 km^2) in the area of indirect effects; 4 acres (0.02 km^2) of Developed, Open Space—Low Intensity occurs within the direct effects area of the assumed transmission line and 90 acres (0.4 km^2) in the area of indirect effects.

11.6.10.3 SEZ-Specific Design Features and Design Feature Effectiveness

In addition to programmatic design features, SEZ-specific design features would reduce the potential for impacts on plant communities. While specific practices are best established when project details are considered, some SEZ-specific design features can be identified at this time, as follows.

- An Integrated Vegetation Management Plan, addressing invasive species control, and an Ecological Resources Mitigation and Monitoring Plan, addressing habitat restoration, should be approved and implemented to increase the potential for successful restoration of desert scrub, greasewood flat, and other affected habitats, and to minimize the potential for the spread of invasive species. Invasive species control should focus on biological and mechanical methods where possible to reduce the use of herbicides.

- All riparian, dry wash, and playa communities within the SEZ and transmission line corridor should be avoided to the extent practicable, and any impacts minimized and mitigated. Any Joshua tree or other *Yucca* species, cacti, or succulent plant species that cannot be avoided should be salvaged. A buffer area should be maintained around dry wash, riparian, and playa habitats to reduce the potential for impacts.

- Appropriate engineering controls should be used to minimize impacts on dry wash, playa, wetland, greasewood flat, and riparian habitats, including downstream occurrences, resulting from surface water runoff, erosion,

sedimentation, altered hydrology, accidental spills, or fugitive dust deposition to these habitats. Appropriate buffers and engineering controls would be determined through agency consultation.

- Groundwater withdrawals should be limited to reduce the potential for indirect impacts on habitats associated with springs. Potential impacts on springs should be determined through hydrological studies.

If these SEZ-specific design features are implemented in addition to other programmatic design features, it is anticipated that a high potential for impacts from invasive species and potential impacts on dry washes, playas, riparian habitats, wetlands, and springs would be reduced to a minimal potential for impact.

11.6.11 Wildlife and Aquatic Biota

This section addresses wildlife (amphibians, reptiles, birds, and mammals) and aquatic biota that could occur within the potentially affected area of the proposed Gold Point SEZ. Wildlife known to occur within 50 mi (80 km) of the SEZ (i.e., the SEZ region) were determined from the SWReGAP (USGS 2007). Land cover types suitable for each species were determined from the SWReGAP (USGS 2004, 2005a, 2007). The amount of aquatic habitat within the SEZ region was determined by estimating the length of linear perennial stream and canal features and the area of standing water body features (i.e., ponds, lakes, and reservoirs) within 50 mi (80 km) of the SEZ using available GIS surface water datasets.

The affected area considered in this assessment included the areas of direct and indirect effects. The area of direct effects was defined as the area that would be physically modified during project development (i.e., where ground-disturbing activities would occur) and included the SEZ and a 250-ft (76-m) wide portion of an assumed 22-mi (35.4-km) long transmission line corridor. The maximum developed area within the SEZ would be 3,848 acres (15.6 km^2).

The area of indirect effects was defined as the area within 5 mi (8 km) of the SEZ boundary and within a 1.0-mi (1.6-km) wide transmission line corridor where ground-disturbing activities would not occur, but that could be indirectly affected by activities in the areas of direct effects (e.g., surface runoff, dust, noise, lighting, and accidental spills). An additional area of indirect effects was considered for 17 mi (27.4 km) of the transmission line corridor that would extend beyond the 5-mi (8-km) area of indirect effects for the SEZ. The potential degree of indirect effects would decrease with increasing distance from the SEZ. The area of indirect effects was identified on the basis of professional judgment and was considered sufficiently large to bound the area that would potentially be subject to indirect effects. These areas of direct and indirect effects are defined and the impact assessment approach is described in Appendix M.

Dominant land cover habitats in the affected area are sagebrush shrubland and desert scrub (see Section 11.6.10). An unnamed wash traverses the SEZ, and converges with Jackson Wash, about 1.5 mi (2.4 km) east of the proposed Gold Point SEZ (Figure 11.6.9.1-1). Several ephemeral washes converge to a small playa area in the northeast corner of the SEZ.

11.6.11.1 Amphibians and Reptiles

11.6.11.1.1 Affected Environment

This section addresses amphibian and reptile species that are known to occur, or for which potentially suitable habitat occurs, on or within the potentially affected area of the proposed Gold Point SEZ. The list of amphibian and reptile species potentially present in the SEZ area was determined from species lists available from the Nevada Natural Heritage Program (NDCNR 2002) and range maps and habitat information available from the California Wildlife Habitat Relationships System (CDFG 2008) and the SWReGAP (USGS 2007). Land cover types

suitable for each species were determined from the SWReGAP (USGS 2004, 2005a, 2007). See Appendix M for additional information on the approach used.

Based on species distributions within the area of the SEZ and habitat preferences of the amphibian species, the Great Plains toad (*Bufo cognatus*) and red-spotted toad (*Bufo punctatus*) would be expected to occur within the SEZ (USGS 2007; Stebbins 2003). Both toad species would most likely occur in or near the wash and playa habitats within the SEZ.

More than 25 reptile species occur within the area that encompasses the proposed Gold Point SEZ (USGS 2007; Stebbins 2003). The desert tortoise (*Gopherus agassizii*) is a federal and state listed threatened species. This species is discussed in Section 11.6.12. Lizard species expected to occur within the SEZ include the desert horned lizard (*Phrynosoma platyrhinos*), Great Basin collared lizard (*Crotaphytus bicinctores*), long-nosed leopard lizard (*Gambelia wislizenii*), western fence lizard (*Sceloporus occidentalis*), western whiptail (*Cnemidophorus tigris*), and zebra-tailed lizard (*Callisaurus draconoides*). Snake species expected to occur within the SEZ are the coachwhip (*Masticophis flagellum*), common kingsnake (*Lampropeltis getula*), glossy snake (*Arizona elegans*), gophersnake (*Pituophis catenifer*), groundsnake (*Sonora semiannulata*), long-nosed snake (*Rhinocheilus lecontei*), and nightsnake (*Hypsiglena torquata*). The Mojave rattlesnake (*Crotalus scutulatus*) would be the most common poisonous snake species expected to occur on the SEZ.

Table 11.6.11.1-1 provides habitat information for representative amphibian and reptile species that could occur within the proposed Gold Point SEZ. Special status amphibian and reptile species are addressed in Section 11.6.12.

11.6.11.1.2 Impacts

The types of impacts that amphibians and reptiles could incur from construction, operation, and decommissioning of utility-scale solar energy facilities are discussed in Section 5.10.2.1. Any such impacts would be minimized through the implementation of required programmatic design features described in Appendix A, Section A.2.2, and through the application of any additional mitigation measures. Section 11.6.11.1.3, below, identifies SEZ-specific design features of particular relevance to the proposed Gold Point SEZ.

The assessment of impacts on amphibian and reptile species is based on available information on the presence of species in the affected area as presented in Section 11.6.11.1.1, following the analysis approach described in Appendix M. Additional NEPA assessments and coordination with state natural resource agencies may be needed to address project-specific impacts more thoroughly. These assessments and consultations could result in additional required actions to avoid or mitigate impacts on amphibians and reptiles (see Section 11.6.11.1.3).

In general, impacts on amphibians and reptiles would result from habitat disturbance (i.e., habitat reduction, fragmentation, and alteration) and from disturbance, injury, or mortality to individual amphibians and reptiles. On the basis of the magnitude of impacts on amphibians

TABLE 11.6.11.1-1 Habitats, Potential Impacts, and Potential Mitigation for Representative Amphibian and Reptile Species That Could Occur on or in the Affected Area of the Proposed Gold Point SEZ

Common Name (Scientific Name)	Habitat[a]	Maximum Area of Potential Habitat Affected[b]			Overall Impact Magnitude[f] and Species-Specific Mitigation[g]
		Within SEZ (Direct Effects)[c]	Outside SEZ (Indirect Effects)[d]	Within Transmission Corridor (Indirect and Direct Effects)[e]	
Amphibians					
Great Plains toad (*Bufo cognatus*)	Prefers desert, grassland, and agricultural habitats. Breeds in shallow temporary pools, quiet areas of streams, marshes, irrigation ditches, and flooded fields. In cold winter months, it burrows underground and becomes inactive. About 1,165,800 acres[h] of potentially suitable habitat occurs within the SEZ region.	129 acres of potentially suitable habitat lost (0.01% of available potentially suitable habitat) during construction and operations	10,101 acres of potentially suitable habitat (0.9% of available potentially suitable habitat)	40 acres of potentially suitable habitat lost (0.003% of available potentially suitable habitat) and 805 acres in area of indirect effects	Small overall impact. Avoid playa and wash habitats.
Red-spotted toad (*Bufo punctatus*)	Dry, rocky areas at lower elevations near desert springs and persistent pools along rocky arroyos; desert streams and oases; open grassland; scrubland oaks; and dry woodlands. About 3,104,100 acres of potentially suitable habitat occurs within the SEZ region.	3,848 acres of potentially suitable habitat lost (0.1% of available potentially suitable habitat) during construction and operations	62,556 acres of potentially suitable habitat (2.0% of available potentially suitable habitat)	397 acres of potentially suitable habitat lost (0.01% of available potentially suitable habitat) and 7,988 acres in area of indirect effects	Small overall impact. Other than avoidance of wash and playa habitats, no species-specific mitigation of direct effects is feasible because suitable habitat is widespread in the area of direct effects.
Lizards					
Desert horned lizard (*Phrynosoma platyrhinos*)	Deserts dominated by sagebrush, creosotebush, greasewood, or cactus. Occurs on sandy flats, alluvial fans, washes, and edges of dunes. Burrows in soil during periods of inactivity. About 4,700,900 acres of potentially suitable habitat occurs in the SEZ region.	3,848 acres of potentially suitable habitat lost (0.08% of available potentially suitable habitat) during construction and operations	98,366 acres of potentially suitable habitat (2.1% of available potentially suitable habitat)	655 acres of potentially suitable habitat lost (0.01% of available potentially suitable habitat) and 13,179 acres in area of indirect effects	Small overall impact. Other than avoidance of wash habitat, no species-specific mitigation of direct effects is feasible because suitable habitat is widespread in the area of direct effects.

TABLE 11.6.11.1-1 (Cont.)

Common Name (Scientific Name)	Habitat[a]	Maximum Area of Potential Habitat Affected[b]			Overall Impact Magnitude[f] and Species-Specific Mitigation[g]
		Within SEZ (Direct Effects)[c]	Outside SEZ (Indirect Effects)[d]	Within Transmission Corridor (Indirect and Direct Effects)[e]	
Lizards (Cont.)					
Great Basin collared lizard (*Crotaphytus bicinctores*)	Usually inhabits alluvia, lava flows, mountain slopes, canyons, buttes, rock outcrops, washes, and rocky plains. Limiting factors are presence of large boulders and open/sparse vegetation. About 3,794700 acres of potentially suitable habitat occurs in the SEZ region.	3,848 acres of potentially suitable habitat lost (0.1% of available potentially suitable habitat) during construction and operations	83,658 acres of potentially suitable habitat (2.2% of available potentially suitable habitat)	508 acres of potentially suitable habitat lost (0.01% of available potentially suitable habitat) and 10,221 acres in area of indirect effect	Small overall impact. Other than avoidance of wash habitat, no species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects.
Long-nosed leopard lizard (*Gambelia wislizenii*)	Desert and semidesert areas with scattered shrubs. Prefers sandy or gravelly flats and plains. Also prefers areas with abundant rodent burrows that they occupy when inactive. About 3,740,500 acres of potentially suitable habitat occurs in the SEZ region.	3,848 acres of potentially suitable habitat lost (0.1% of available potentially suitable habitat) during construction and operations	89,458 acres of potentially suitable habitat (2.4% of available potentially suitable habitat)	613 acres of potentially suitable habitat lost (0.02% of available potentially suitable habitat) and 12,340 acres in area of indirect effects	Small overall impact. No species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects.
Western fence lizard (*Sceloporus occidentalis*)	Disturbed areas, roadsides, gravel beds, rock quarries, lava flows, outcrops, talus slopes, shrublands, riparian areas, and coniferous woodlands. About 4,792,900 acres of potentially suitable habitat occurs within the SEZ region.	3,848 acres of potentially suitable habitat lost (0.08% of available potentially suitable habitat) during construction and operations	96,741 acres of potentially suitable habitat (2.0% of available potentially suitable habitat)	648 acres of potentially suitable habitat lost (0.01% of available potentially suitable habitat) and 13,038 acres in area of indirect effects	Small overall impact. No species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects.

TABLE 11.6.11.1-1 (Cont.)

Common Name (Scientific Name)	Habitat[a]	Maximum Area of Potential Habitat Affected[b]: Within SEZ (Direct Effects)[c]	Maximum Area of Potential Habitat Affected[b]: Outside SEZ (Indirect Effects)[d]	Maximum Area of Potential Habitat Affected[b]: Within Transmission Corridor (Indirect and Direct Effects)[e]	Overall Impact Magnitude[f] and Species-Specific Mitigation[g]
Lizards (Cont.)					
Western whiptail (*Aspidoscelis tigris*)	Primarily occurs in sparsely vegetated desert and shrubland habitats. During cold winter months, it often occupies underground burrows created by rodents or other lizards. About 3,818,200 acres of potentially suitable habitat occurs within the SEZ region.	3,848 acres of potentially suitable habitat lost (0.1% of available potentially suitable habitat) during construction and operations	84,083 acres of potentially suitable habitat (2.2% of available potentially suitable habitat)	514 acres of potentially suitable habitat lost (0.01% of available potentially suitable habitat) and 10,342 acres in area of indirect effects	Small overall impact. No species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects.
Zebra-tailed lizard (*Callisaurus draconoides*)	Open, warm-desert habitats, especially dry washes and canyons with fine gravel and sand. About 3,228,400 acres of potentially suitable habitat occurs in the SEZ region.	3,848 acres of potentially suitable habitat lost (0.1% of available potentially suitable habitat) during construction and operations	75,157 acres of potentially suitable habitat (2.3% of available potentially suitable habitat)	473 acres of potentially suitable habitat lost (0.01% of available potentially suitable habitat) and 9,517 acres in area of indirect effects	Small overall impact. Other than avoidance of wash habitat, no species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects.
Snakes					
Coachwhip (*Masticophis flagellum*)	Creosotebush desert, shortgrass prairie, shrub-covered flats and hills. Sandy to rocky substrates. Avoids dense vegetation. About 2,940,100 acres of potentially suitable habitat occurs within the SEZ region.	131 acres of potentially suitable habitat lost (0.004% of available potentially suitable habitat) during construction and operations	36,272 acres of potentially suitable habitat (1.2% of available potentially suitable habitat)	259 acres of potentially suitable habitat lost (0.009% of available potentially suitable habitat) and 5,211 acres in area of indirect effects	Small overall impact.

TABLE 11.6.11.1-1 (Cont.)

Common Name (Scientific Name)	Habitat[a]	Maximum Area of Potential Habitat Affected[b]			Overall Impact Magnitude[f] and Species-Specific Mitigation[g]
		Within SEZ (Direct Effects)[c]	Outside SEZ (Indirect Effects)[d]	Within Transmission Corridor (Indirect and Direct Effects)[e]	
Snakes (Cont.)					
Common kingsnake (*Lampropeltis getula*)	Coniferous forests, woodlands, swampland, coastal marshes, river bottoms, farmlands, prairies, chaparral, and deserts. Uses rock outcrops and rodent burrows for cover. About 4,581,300 acres of potentially suitable habitat occurs within the SEZ region.	3,848 acres of potentially suitable habitat lost (0.08% of available potentially suitable habitat) during construction and operations	85,515 acres of potentially suitable habitat (1.8% of available potentially suitable habitat)	518 acres of potentially suitable habitat lost (0.01% of available potentially suitable habitat) and 10,422 acres in area of indirect effects	Small overall impact. No species-specific mitigation of direct effects is feasible because suitable habitat is widespread in the area of direct effects.
Glossy snake (*Arizona elegans*)	Light shrubby to barren deserts, sagebrush flats, grasslands, and chaparral-covered slopes and woodlands. Prefers sandy grasslands, shrublands and woodlands. About 1,604,100 acres of potentially suitable habitat occurs within the SEZ region.	54 acres of potentially suitable habitat lost (0.003% of available potentially suitable habitat) during construction and operations	22,562 acres of potentially suitable habitat (1.4% of available potentially suitable habitat)	174 acres of potentially suitable habitat lost (0.01% of available potentially suitable habitat) and 3,501 acres in area of indirect effects	Small overall impact.
Gophersnake (*Pituophis catenifer*)	Plains grasslands, sandhills, riparian areas, marshes, edges of ponds and lakes, rocky canyons, semidesert and mountain shrublands, montane woodlands, rural and suburban areas, and agricultural areas. Likely inhabits pocket gopher burrows in winter. About 2,739,600 acres of potentially suitable habitat occurs in the SEZ region.	31 acres of potentially suitable habitat lost (0.001% of available potentially suitable habitat) during construction and operations	28,660 acres of potentially suitable habitat (1.0% of available potentially suitable habitat)	223 acres of potentially suitable habitat lost (0.008% of available potentially suitable habitat) and 4,487 acres in area of indirect effect	Small overall impact.

TABLE 11.6.11.1-1 (Cont.)

Common Name (Scientific Name)	Habitat[a]	Maximum Area of Potential Habitat Affected[b]: Within SEZ (Direct Effects)[c]	Maximum Area of Potential Habitat Affected[b]: Outside SEZ (Indirect Effects)[d]	Maximum Area of Potential Habitat Affected[b]: Within Transmission Corridor (Indirect and Direct Effects)[e]	Overall Impact Magnitude[f] and Species-Specific Mitigation[g]
Snakes (Cont.)					
Groundsnake (*Sonora semiannulata*)	Arid and semiarid regions with rocky to sandy soils. River bottoms, desert flats, sand hummocks, and rocky hillsides. About 2,748,300 acres of potentially suitable habitat occurs within the SEZ region.	25 acres of potentially suitable habitat lost (0.001% of available potentially suitable habitat) during construction and operations	36,642 acres of potentially suitable habitat (1.3% of available potentially suitable habitat)	249 acres of potentially suitable habitat lost (0.009% of available potentially suitable habitat) and 5,010 acres in area of indirect effects	Small overall impact. Avoid greasewood flat habitat.
Mojave rattlesnake (*Crotalus scutulatus*)	Mostly upland desert and lower mountain slopes. Barren desert, grassland, open juniper woodland, and scrubland; especially common in areas of scattered scrubby growth such as creosote and mesquite. About 5,435,700 acres of potentially suitable habitat occurs within the SEZ region.	3,848 acres of potentially suitable habitat lost (0.07% of available potentially suitable habitat) during construction and operations	99,023 acres of potentially suitable habitat (1.8% of available potentially suitable habitat)	666 acres of potentially suitable habitat lost (0.01% of available potentially suitable habitat) and 13,400 acres in area of indirect effects	Small overall impact. No species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects.
Nightsnake (*Hypsiglena torquata*)	Arid and semiarid desert flats, plains, and woodlands; areas with rocky and sandy soils are preferred. During cold periods of the year, it seeks refuge underground, in crevices, or under rocks. About 3,460,800 acres of potentially suitable habitat occurs within the SEZ region.	3,848 acres of potentially suitable habitat lost (0.1% of available potentially suitable habitat) during construction and operations	69,785 acres of potentially suitable habitat (2.0% of available potentially suitable habitat)	434 acres of potentially suitable habitat lost (0.01% of available potentially suitable habitat) and 8,732 acres in area of indirect effects	Small overall impact. No species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects.

Footnotes on next page.

TABLE 11.6.11.1-1 (Cont.)

[a] Potentially suitable habitat was determined by using SWReGAP habitat suitability and land cover models. Area of potentially suitable habitat for each species is presented for the SEZ region, which is defined as the area within 50 mi (80 km) of the SEZ center.

[b] 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 and land cover models. This approach probably overestimates the amount of suitable habitat in the project area.

[c] Direct effects within the SEZ would consist of the ground-disturbing activities associated with construction and the maintenance of an altered environment associated with operations. A maximum of 3,848 acres (15.6 km^2) would be developed in the SEZ.

[d] The area of indirect effects was assumed to be the area adjacent to the SEZ within 5 mi (8 km) of the SEZ boundary and within the 1-mi (1.6-km) wide transmission line corridor (less the assumed area of direct effects) that extends beyond the 5-mi (8-km) area adjacent to the SEZ boundary. Potentially suitable habitat within the SEZ greater than the maximum of 3,848 acres (15.6 km^2) of direct effects was also added to the area of indirect effects. Indirect effects include effects from surface runoff, dust, noise, lighting, and so on from the SEZ, but do not include ground-disturbing activities. The potential degree of indirect effects would decrease with increasing distance from the SEZ.

[e] For transmission line development, direct effects were estimated within a 22-mi (35-km) long, 250-ft (76-m) wide ROW for an assumed new transmission line connecting to the nearest existing line. Indirect effects were estimated within a 1-mi (1.6-km) wide transmission corridor to the existing transmission line, less the assumed area of direct effects. Additional indirect effects for the transmission line considered only the 17-mi (27-km) long portion that extends outside of the 5-mi (8-km) area of indirect effects for the SEZ

[f] 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. Programmatic design features would reduce most indirect effects to negligible levels.

[g] 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.

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

Sources: CDFG (2008); NatureServe (2010); NDCNR (2002); USGS (2004, 2005a, 2007).

and reptiles summarized in Table 11.6.11.1-1, direct impacts on amphibian and reptile species would be small, as 0.1% or less of potentially suitable habitats identified for the species in the SEZ region would be lost. Larger areas of potentially suitable habitats for most amphibian and reptile species occur within the area of potential indirect effects (e.g., up to 2.4% of available habitat for the long-nosed leopard lizard). Other impacts on amphibians and reptiles could result from surface water and sediment runoff from disturbed areas, fugitive dust generated by project activities, accidental spills, collection, and harassment. These indirect impacts are expected to be negligible with implementation of programmatic design features.

Decommissioning after operations cease could result in short-term negative impacts on individuals and habitats within and adjacent to the SEZ. The negative impacts of decommissioning would be reduced or eliminated as reclamation proceeds. Potentially long-term benefits could accrue as habitats are restored in previously disturbed areas. Section 5.10.2.1.4 provides an overview of the impacts of decommissioning and reclamation on wildlife. Of particular importance for amphibian and reptile species would be the restoration of original ground surface contours, soils, and native plant communities associated with semiarid shrublands.

11.6.11.1.3 SEZ-Specific Design Features and Design Feature Effectiveness

The successful implementation of programmatic design features presented in Appendix A, Section A.2.2, would reduce the potential for effects on amphibians and reptiles, especially for those species that depend on habitat types that can be avoided (e.g., washes and playas). Indirect impacts could be reduced to negligible levels by implementing programmatic design features, especially those engineering controls that would reduce runoff, sedimentation, spills, and fugitive dust. While SEZ-specific design features are best established when considering specific project details, one design feature can be identified at this time:

- Development in wash, playa, and cliff and canyon habitats should be avoided.

If this SEZ-specific design feature is implemented in addition to the programmatic design features, impacts on amphibian and reptile species could be reduced. However, as potentially suitable habitats for a number of the representative amphibian and reptile species occur throughout much of the SEZ, additional species-specific mitigation of direct effects for those species would be difficult or infeasible.

11.6.11.2 Birds

11.6.11.2.1 Affected Environment

This section addresses bird species that are known to occur, or for which potentially suitable habitat occurs, on or within the potentially affected area of the proposed Gold Point SEZ. The list of bird species potentially present in the SEZ area was determined from the

Nevada Natural Heritage Program (NDCNR 2002) and range maps and habitat information available from the California Wildlife Habitat Relationships System (CDFG 2008) and the SWReGAP (USGS 2007). Land cover types suitable for each species were determined from the SWReGAP (USGS 2004, 2005a, 2007). See Appendix M for additional information on the approach used.

Five bird species that could occur on or in the affected area of the SEZ are considered focal species in the *Desert Bird Conservation Plan* (CalPIF 2009): ash-throated flycatcher (*Myiarchus cinerascens*), burrowing owl (*Athene cunicularia*), common raven (*Corvus corax*), ladder-backed woodpecker (*Picoides scalaris*), and Le Conte's thrasher (*Toxostoma lecontei*). Habitats for most of these species are described in Table 11.6.11.2-1. Because of its special species status, the burrowing owl is discussed in Section 11.6.12.

Desert Focal Bird Species

Bird species whose requirements define spatial attributes, habitat characteristics, and management regimes representative of a healthy desert system (Chase and Geupel 2005).

Waterfowl, Wading Birds, and Shorebirds

As discussed in Section 4.10.2.2.2, waterfowl (ducks, geese, and swans), wading birds (herons and cranes), and shorebirds (avocets, gulls, plovers, rails, sandpipers, stilts, and terns) are among the most abundant groups of birds in the six-state study area. However, within the proposed Gold Point SEZ, waterfowl, wading birds, and shorebird species would be mostly absent to uncommon. Playa and wash habitats within the SEZ may attract shorebird species, but Deep Springs Lake, Cottonwood and Crooked creeks, and larger washes and dry lakes within 50 mi (80 km) of the SEZ would provide more viable habitat for this group of birds. The killdeer (*Charadrius vociferus*) is the shorebird species most likely to occur within the SEZ.

Neotropical Migrants

As discussed in Section 4.10.2.2.3, neotropical migrants represent the most diverse category of birds within the six-state study area. Species expected to occur within the proposed Gold Point SEZ include the ash-throated flycatcher, Bewick's wren (*Thryomanes bewickii*), Brewer's sparrow (*Spizella breweri*), cactus wren (*Campylorhynchus brunneicapillus*), common poorwill (*Phalaenoptilus nuttallii*), common raven, greater roadrunner (*Geococcyx californianus*), horned lark (*Eremophila alpestris*), ladder-backed woodpecker, Le Conte's thrasher, lesser nighthawk (*Chordeiles acutipennis*), loggerhead shrike (*Lanius ludovicianus*), northern mockingbird (*Mimus polyglottos*), rock wren (*Salpinctes obsoletus*), sage sparrow (*Amphispiza belli*), Say's phoebe (*Sayornis saya*), and western kingbird (*Tyrannus verticalis*) (CDFG 2008; NDCNR 2002; USGS 2007).

TABLE 11.6.11.2-1 Habitats, Potential Impacts, and Potential Mitigation for Representative Bird Species That Could Occur on or in the Affected Area of the Proposed Gold Point SEZ

Common Name (Scientific Name)	Habitat[a]	Maximum Area of Potential Habitat Affected[b]			Overall Impact Magnitude[f] and Species-Specific Mitigation[g]
		Within SEZ Direct Effects)[c]	Outside SEZ (Indirect Effects)[d]	Within Transmission Corridor (Indirect and Direct Effects)[e]	
Shorebirds					
Killdeer (*Charadrius vociferus*)	Open areas such as fields, meadows, lawns, mudflats, and shores. Nests on ground in open dry or gravelly locations. About 129,200 acres[h] of potentially suitable habitat occurs within the SEZ region.	29 acres of potentially suitable habitat lost (0.02% of available potentially suitable habitat) during construction and operations	145 acres of potentially suitable habitat (0.1% of available potentially suitable habitat)	7 acres of potentially suitable habitat lost (0.005% of available potentially suitable habitat) and 141 acres in area of indirect effects	Small overall impact. Avoid playa and wash habitats. Some measure of mitigation provided by the requirements of the Migratory Bird Treaty Act.
Neotropical Migrants					
Ash-throated flycatcher (*Myiarchus cinerascens*)	Common in scrub and woodland habitats including desert riparian and desert washes. Requires hole/cavity for nesting. Uses shrubs or small trees for foraging perches. About 4,365,800 acres of potentially suitable habitat occurs within the SEZ region.	3,848 acres of potentially suitable habitat lost (0.09% of available potentially suitable habitat) during construction and operations	90,225 acres of potentially suitable habitat (2.1% of available potentially suitable habitat)	621 acres of potentially suitable habitat lost (0.01% of available potentially suitable habitat) and 12,495 acres in area of indirect effects	Small overall impact. Other than avoidance of wash habitat, no species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects. Some measure of mitigation provided by the requirements of the Migratory Bird Treaty Act.

TABLE 11.6.11.2-1 (Cont.)

Common Name (Scientific Name)	Habitat[a]	Maximum Area of Potential Habitat Affected[b]			Overall Impact Magnitude[f] and Species-Specific Mitigation[g]
		Within SEZ Direct Effects)[c]	Outside SEZ (Indirect Effects)[d]	Within Transmission Corridor (Indirect and Direct Effects)[e]	
Neotropical Migrants (Cont.)					
Bewick's wren (*Thryomanes bewickii*)	Generally associated with dense, brushy habitats. Permanent resident of lowland deserts and pinyon-juniper forests of southern Utah. Breeding occurs in brushy areas of open woodlands and other open habitats. Cavity nester with nests constructed in small enclosed areas such as tree cavities, nesting boxes, rock crevices, or the center of a brush pile. About 3,047,900 acres of potentially suitable habitat occurs within the SEZ region.	160 acres of potentially suitable habitat lost (0.005% of available potentially suitable habitat) during construction and operations	36,303 acres of potentially suitable habitat (1.2% of available potentially suitable habitat)	261 acres of potentially suitable habitat lost (0.009% of available potentially suitable habitat) and 5,251 acres in area of indirect effects	Small overall impact. Some measure of mitigation provided by the requirements of the Migratory Bird Treaty Act.
Brewer's sparrow (*Spizella breweri*)	Considered a shrub-steppe obligate. Occupies open desert scrub and cropland habitats. However, may also occur in high desert scrub (greasewood) habitats, particularly where adjacent to shrub-steppe habitats. Nests are usually located in patches of sagebrush that are taller and denser, with more bare ground and less herbaceous cover, than the surrounding habitat. Also breeds in large sagebrush openings in pinyon-juniper or coniferous forest habitats. About 3,801,700 acres of potentially suitable habitat occurs in the SEZ region.	3,848 acres of potentially suitable habitat lost (0.1% of available potentially suitable habitat) during construction and operations	89,479 acres of potentially suitable habitat (2.4% of available potentially suitable habitat)	613 acres of potentially suitable habitat lost (0.02% of available potentially suitable habitat) and 12,334 acres in area of indirect effects	Small overall impact. No species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects. Some measure of mitigation provided by the requirements of the Migratory Bird Treaty Act.

TABLE 11.6.11.2-1 (Cont.)

Common Name (Scientific Name)	Habitat[a]	Maximum Area of Potential Habitat Affected[b]			Overall Impact Magnitude[f] and Species-Specific Mitigation[g]
		Within SEZ Direct Effects)[c]	Outside SEZ (Indirect Effects)[d]	Within Transmission Corridor (Indirect and Direct Effects)[e]	
Neotropical Migrants (Cont.)					
Common poorwill (*Phalaenoptilus nuttallii*)	Scrubby and brushy areas, prairie, desert, rocky canyons, open woodlands, and broken forests. Mostly in arid and semi-arid habitats. Nests in open areas on a bare site. About 4,474,800 acres of potentially suitable habitat occurs within the SEZ region.	3,848 acres of potentially suitable habitat lost (0.09% of available potentially suitable habitat) during construction and operations	88,928 acres of potentially suitable habitat (2.0% of available potentially suitable habitat)	621 acres of potentially suitable habitat lost (0.01% of available potentially suitable habitat) and 12,495 acres in area of indirect effects	Small overall impact. No species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects.
Common raven (*Corvus corax*)	Occurs in most habitats. Trees and cliffs provide cover. Roosts primarily in trees. Nests on cliffs, bluffs, tall trees, or man-made structures. Forages in sparse, open terrain. About 4,755,500 acres of potentially suitable habitat occurs in the SEZ region.	3,848 acres of potentially suitable habitat lost (0.08% of available potentially suitable habitat) during construction and operations	98,891 acres of potentially suitable habitat (2.1% of available potentially suitable habitat)	661 acres of potentially suitable habitat lost (0.01% of available potentially suitable habitat) and 13,299 acres in area of indirect effects	Small overall impact. No species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects. Some measure of mitigation provided by the requirements of the Migratory Bird Treaty Act.

TABLE 11.6.11.2-1 (Cont.)

Common Name (Scientific Name)	Habitat[a]	Maximum Area of Potential Habitat Affected[b]			Overall Impact Magnitude[f] and Species-Specific Mitigation[g]
		Within SEZ Direct Effects)[c]	Outside SEZ (Indirect Effects)[d]	Within Transmission Corridor (Indirect and Direct Effects)[e]	
Neotropical Migrants (Cont.)					
Greater roadrunner (*Geococcyx californianus*)	Desert scrub, chaparral, edges of cultivated lands, and arid open areas with scattered brush. Requires thickets, large bushes, or small trees for shade, refuge, and roosting. Usually nests low in trees, shrubs, or clumps of cactus. Rarely nests on ground. About 4,772,900 acres of potentially suitable habitat occurs in the SEZ region.	3,848 acres of potentially suitable habitat lost (0.08% of available potentially suitable habitat) during construction and operations	89,983 acres of potentially suitable habitat (1.9% of available potentially suitable habitat)	620 acres of potentially suitable habitat lost (0.01% of available potentially suitable habitat) and 12,474 acres in area of indirect effects	Small overall impact. No species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects. Some measure of mitigation provided by the requirements of the Migratory Bird Treaty Act.
Horned lark (*Eremophila alpestris*)	Common to abundant resident in a variety of open habitats. Breeds in grasslands, sagebrush, semidesert shrublands, and alpine tundra. During migration and winter, inhabits the same habitats, other than tundra, and occurs in agricultural areas. Usually occurs where plant density is low and there are exposed soils. About 4,198,900 acres of potentially suitable habitat occurs in the SEZ region.	3,848 acres of potentially suitable habitat lost (0.09% of available potentially suitable habitat) during construction and operations	98,444 acres of potentially suitable habitat (2.3% of available potentially suitable habitat)	658 acres of potentially suitable habitat lost (0.02% of available potentially suitable habitat) and 13,239 acres in area of indirect effects	Small overall impact. No species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects. Some measure of mitigation provided by the requirements of the Migratory Bird Treaty Act.

TABLE 11.6.11.2-1 (Cont.)

Common Name (Scientific Name)	Habitat[a]	Maximum Area of Potential Habitat Affected[b]			Overall Impact Magnitude[f] and Species-Specific Mitigation[g]
		Within SEZ Direct Effects)[c]	Outside SEZ (Indirect Effects)[d]	Within Transmission Corridor (Indirect and Direct Effects)[e]	
Neotropical Migrants (Cont.)					
Ladder-backed woodpecker (Picoides scalaris)	Variety of habitats including deserts, arid scrub, riparian woodlands, mesquite, scrub oak, pinyon-juniper woodlands. Digs nest hole in rotted stub or dead or dying branches of various trees. Also nests in saguaro, agave, yucca, fence posts, and utility poles. Nests on ledges; branches of trees, shrubs, and cactus; and holes in trees or walls. About 3,179,500 acres of potentially suitable habitat occurs within the SEZ region.	3,848 acres of potentially suitable habitat lost (0.1% of available potentially suitable habitat) during construction and operations	62,853 acres of potentially suitable habitat (2.0% of available potentially suitable habitat)	400 acres of potentially suitable habitat lost (0.01% of available potentially suitable habitat) and 8,048 acres in area of indirect effects	Small overall impact. No species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects. Some measure of mitigation provided by the requirements of the Migratory Bird Treaty Act.
Le Conte's thrasher (*Toxostoma lecontei*)	Open desert wash, alkali desert scrub, and desert succulent shrub habitats. Prefers to nest and forage in arroyos and washes lined with dense stands of creosotebush and salt bush. About 2,537,800 acres of potentially suitable habitat occurs in the SEZ region.	3,848 acres of potentially suitable habitat lost (0.2% of available potentially suitable habitat) during construction and operations	62,418 acres of potentially suitable habitat (2.5% of available potentially suitable habitat)	397 acres of potentially suitable habitat lost (0.02% of available potentially suitable habitat) and 7,988 acres in area of indirect effects	Small overall impact. Other than avoidance of wash habitat, no species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects. Some measure of mitigation provided by the requirements of the Migratory Bird Treaty Act.

TABLE 11.6.11.2-1 (Cont.)

Common Name (Scientific Name)	Habitat[a]	Maximum Area of Potential Habitat Affected[b]			Overall Impact Magnitude[f] and Species-Specific Mitigation[g]
		Within SEZ Direct Effects)[c]	Outside SEZ (Indirect Effects)[d]	Within Transmission Corridor (Indirect and Direct Effects)[e]	
Neotropical Migrants (Cont.)					
Lesser nighthawk (*Chordeiles acutipennis*)	Open country, desert regions, scrub, savanna, and cultivated areas. Usually near water including open marshes, salt ponds, large rivers, rice paddies, and beaches. Roosts on low perches or the ground. Nests in the open on bare sites. About 4,288,300 acres of potentially suitable habitat occurs within the SEZ region.	3,848 acres of potentially suitable habitat lost (0.09% of available potentially suitable habitat) during construction and operations	89,458 acres of potentially suitable habitat (2.1% of available potentially suitable habitat)	613 acres of potentially suitable habitat lost (0.01% of available potentially suitable habitat) and 12,334 acres in area of indirect effects	Small overall impact. No species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects.
Loggerhead shrike (*Lanius ludovicianus*)	Open country with scattered trees and shrubs, savanna, desert scrub, desert riparian, Joshua tree, and occasionally open woodland habitats. Perches on poles, wires, or fence posts (suitable hunting perches are important aspect of habitat). Nests in shrubs and small trees. About 4,732,500 acres of potentially suitable habitat occurs in the SEZ region.	3,848 acres of potentially suitable habitat lost (0.08% of available potentially suitable habitat) during construction and operations	98,831 acres of potentially suitable habitat (2.1% of available potentially suitable habitat)	660 acres of potentially suitable habitat lost (0.01% of available potentially suitable habitat) and 13,279 acres in area of indirect effects	Small overall impact. No species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects. Some measure of mitigation provided by the requirements of the Migratory Bird Treaty Act.

TABLE 11.6.11.2-1 (Cont.)

Common Name (Scientific Name)	Habitat[a]	Maximum Area of Potential Habitat Affected[b]			Overall Impact Magnitude[f] and Species-Specific Mitigation[g]
		Within SEZ Direct Effects)[c]	Outside SEZ (Indirect Effects)[d]	Within Transmission Corridor (Indirect and Direct Effects)[e]	
Neotropical Migrants (Cont.)					
Northern mockingbird (*Mimus polyglottos*)	Parkland, cultivated lands, second-growth habitats, desert scrub, and riparian areas. Forages on ground in short, grassy to nearly barren substrates. About 5,167,800 acres of potentially suitable habitat occurs within the SEZ region.	3,848 acres of potentially suitable habitat lost (0.07% of available potentially suitable habitat) during construction and operations	98,921 acres of potentially suitable habitat (1.9% of available potentially suitable habitat)	663 acres of potentially suitable habitat lost (0.01% of available potentially suitable habitat) and 13,340 acres in area of indirect effects	Small overall impact. No species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects. Some measure of mitigation provided by the requirements of the Migratory Bird Treaty Act.
Rock wren (*Salpinctes obsoletus*)	Arid and semiarid habitats. Breeds in areas with talus slopes, scrublands, or dry washes. Nests, constructed of plant materials, are located in rock crevices, and the nest entrance is paved with small rocks and stones. About 5,235,000 acres of potentially suitable habitat occurs within the SEZ region.	3,848 acres of potentially suitable habitat lost (0.07% of available potentially suitable habitat) during construction and operations	98,969 acres of potentially suitable habitat (1.9% of available potentially suitable habitat)	665 acres of potentially suitable habitat lost (0.01% of available potentially suitable habitat) and 13,380 acres in area of indirect effects	Small overall impact. Other than avoidance of wash habitat, no species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects. Some measure of mitigation provided by the requirements of the Migratory Bird Treaty Act.

TABLE 11.6.11.2-1 (Cont.)

Common Name (Scientific Name)	Habitat[a]	Maximum Area of Potential Habitat Affected[b]			Overall Impact Magnitude[f] and Species-Specific Mitigation[g]
		Within SEZ Direct Effects)[c]	Outside SEZ (Indirect Effects)[d]	Within Transmission Corridor (Indirect and Direct Effects)[e]	
Neotropical Migrants (Cont.)					
Sage sparrow (*Amphispiza belli*)	Prefers shrubland, grassland, and desert habitats. The nest, constructed of twigs and grasses, is located either low in a shrub or on the ground. About 4,005,800 acres of potentially suitable habitat occurs within the SEZ region.	3,848 acres of potentially suitable habitat lost (0.1% of available potentially suitable habitat) during construction and operations	97,364 acres of potentially suitable habitat (2.4% of available potentially suitable habitat)	656 acres of potentially suitable habitat lost (0.02% of available potentially suitable habitat) and 13,199 acres in area of indirect effects	Small overall impact. No species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects. Some measure of mitigation provided by the requirements of the Migratory Bird Treaty Act.
Say's phoebe (*Sayornis saya*)	Arid open country, deserts, sagebrush plains, dry barren foothills, canyons, cliffs, ranches, and rural homes. Nests in cliff crevices, holes in banks, sheltered ledges, tree cavities, under bridges and roofs, and in mines. About 2,558,900 acres of potentially suitable habitat occurs within the SEZ region.	108 acres of potentially suitable habitat lost (0.004% of available potentially suitable habitat) during construction and operations	29,455 acres of potentially suitable habitat (1.2% of available potentially suitable habitat)	231 acres of potentially suitable habitat lost (0.009% of available potentially suitable habitat) and 4,648 acres in area of indirect effects	Small overall impact. Some measure of mitigation provided by the requirements of the Migratory Bird Treaty Act.

TABLE 11.6.11.2-1 (Cont.)

Common Name (Scientific Name)	Habitat[a]	Maximum Area of Potential Habitat Affected[b]			Overall Impact Magnitude[f] and Species-Specific Mitigation[g]
		Within SEZ Direct Effects)[c]	Outside SEZ (Indirect Effects)[d]	Within Transmission Corridor (Indirect and Direct Effects)[e]	
Neotropical Migrants (Cont.)					
Western kingbird (*Tyrannus verticalis*)	Occurs in a variety of habitats including riparian forests and woodlands, savannas, shrublands, agricultural lands, deserts, and urban areas. Nesting occurs in trees, bushes, and other raised areas, such as buildings. Migrates to Central America or the southeastern United States for the winter. About 4,046,000 acres of potentially suitable habitat occurs within the SEZ region.	3,848 acres of potentially suitable habitat lost (0.1% of available potentially suitable habitat) during construction and operations	98,064 acres of potentially suitable habitat (2.4% of available potentially suitable habitat)	653 acres of potentially suitable habitat lost (0.02% of available potentially suitable habitat) and 13,138 acres in area of indirect effects	Small overall impact. No species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects. Some measure of mitigation provided by the requirements of the Migratory Bird Treaty Act.
Birds of Prey					
American kestrel (*Falco sparverius*)	Occurs in most open habitats, in various shrub and early successional forest habitats, forest openings, and various ecotones. Perches on trees, snags, rocks, utility poles and wires, and fence posts. Uses cavities in trees, snags, rock areas, banks, and buildings for nesting and cover. About 4,756,900 acres of potentially suitable habitat occurs in the SEZ region.	3,848 acres of potentially suitable habitat lost (0.08% of available potentially suitable habitat) during construction and operations	98,766 acres of potentially suitable habitat (2.1% of available potentially suitable habitat)	661 acres of potentially suitable habitat lost (0.01% of available potentially suitable habitat) and 13,299 acres in area of indirect effects	Small overall impact. No species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects.

TABLE 11.6.11.2-1 (Cont.)

Common Name (Scientific Name)	Habitat[a]	Maximum Area of Potential Habitat Affected[b]			Overall Impact Magnitude[f] and Species-Specific Mitigation[g]
		Within SEZ Direct Effects)[c]	Outside SEZ (Indirect Effects)[d]	Within Transmission Corridor (Indirect and Direct Effects)[e]	
Birds of Prey (Cont.)					
Golden eagle (*Aquila chrysaetos*)	Grasslands, shrublands, pinyon-juniper woodlands, and ponderosa pine forests. Occasionally in most other habitats, especially during migration and winter. Nests on cliffs and sometimes trees in rugged areas, with breeding birds ranging widely over surrounding areas. About 4,800,100 acres of potentially suitable habitat occurs in the SEZ region.	3,848 acres of potentially suitable habitat lost (0.08% of available potentially suitable habitat) during construction and operations	98,667 acres of potentially suitable habitat (2.1% of available potentially suitable habitat)	656 acres of potentially suitable habitat lost (0.01% of available potentially suitable habitat) and 13,199 acres in area of indirect effects	Small overall impact. No species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects. Some measure of mitigation provided by the requirements of the Bald and Golden Eagle Protection Act.
Great horned owl (*Bubo virginianus*)	Needs large abandoned bird nest or large cavity for nesting. Usually lives on forest edges and hunts in open areas. In desert areas, requires wooded cliff areas for nesting. About 5,070,200 acres of potentially suitable habitat occurs within the SEZ region.	3,848 acres of potentially suitable habitat lost (0.08% of available potentially suitable habitat) during construction and operations	99,023 acres of potentially suitable habitat (2.0% of available potentially suitable habitat)	666 acres of potentially suitable habitat lost (0.01% of available potentially suitable habitat) and 13,400 acres in area of indirect effects	Small overall impact. No species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects.

TABLE 11.6.11.2-1 (Cont.)

Common Name (Scientific Name)	Habitat[a]	Maximum Area of Potential Habitat Affected[b]			Overall Impact Magnitude[f] and Species-Specific Mitigation[g]
		Within SEZ Direct Effects)[c]	Outside SEZ (Indirect Effects)[d]	Within Transmission Corridor (Indirect and Direct Effects)[e]	
Birds of Prey (Cont.)					
Long-eared owl (*Asio otus*)	Nests and roosts in dense vegetation and hunts in open areas (e.g., creosotebush-bursage flats, desert scrub, grasslands, and agricultural fields). About 4,611,800 acres of potentially suitable habitat occurs within the SEZ region.	3,848 acres of potentially suitable habitat lost (0.08% of available potentially suitable habitat) during construction and operations	98,391 acres of potentially suitable habitat (2.0% of available potentially suitable habitat)	653 acres of potentially suitable habitat lost (0.01% of available potentially suitable habitat) and 13,138 acres in area of indirect effects	Small overall impact. No species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects.
Red-tailed hawk (*Buteo jamaicensis*)	Wide variety of habitats from deserts, mountains, and populated valleys. Open areas with scattered, elevated perch sites such as scrub desert, plains and montane grassland, agricultural fields, pastures, urban parklands, broken coniferous forests, and deciduous woodland. Nests on cliff ledges or in tall trees. About 3,192,100 acres of potentially suitable habitat occurs in the SEZ region.	3,848 acres of potentially suitable habitat lost (0.1% of available potentially suitable habitat) during construction and operations	85,251 acres of potentially suitable habitat (2.7% of available potentially suitable habitat)	576 acres of potentially suitable habitat lost (0.02% of available potentially suitable habitat) and 11,589 acres in area of indirect effects	Small overall impact. No species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects.

TABLE 11.6.11.2-1 (Cont.)

Common Name (Scientific Name)	Habitat[a]	Maximum Area of Potential Habitat Affected[b]			Overall Impact Magnitude[f] and Species-Specific Mitigation[g]
		Within SEZ Direct Effects)[c]	Outside SEZ (Indirect Effects)[d]	Within Transmission Corridor (Indirect and Direct Effects)[e]	
Birds of Prey (Cont.)					
Turkey vulture (*Cathartes aura*)	Occurs in open stages of most habitats that provide adequate cliffs or large trees for nesting, roosting, and resting. Migrates and forages over most open habitats. Will roost communally in trees, exposed boulders, and occasionally transmission line support towers. About 3,517,900 acres of potentially suitable habitat occurs in the SEZ region.	3,848 acres of potentially suitable habitat lost (0.1% of available potentially suitable habitat) during construction and operations	62,853 acres of potentially suitable habitat (1.8% of available potentially suitable habitat)	400 acres of potentially suitable habitat lost (0.01% of available potentially suitable habitat) and 8,048 acres in area of indirect effects	Small overall impact. No species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects.
Upland Game Birds					
Chukar (*Alectoris chukar*)	Steep, semiarid slopes with rocky outcrops and shrubs with a grass and forb understory. Distribution often follows that of cheatgrass. Sources of water are required during hot, dry periods, with most birds found within 0.25 mi (0.4 km) of water during the brooding period. About 4,585,400 acres of potentially suitable habitat occurs in the SEZ region.	3,848 acres of potentially suitable habitat lost (0.08% of available potentially suitable habitat) during construction and operations	97,747 acres of potentially suitable habitat (2.1% of available potentially suitable habitat)	646 acres of potentially suitable habitat lost (0.01% of available potentially suitable habitat) and 12,998 acres in area of indirect effects	Small overall impact. Other than avoidance of wash and playa habitats, no species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects.

TABLE 11.6.11.2-1 (Cont.)

Common Name (Scientific Name)	Habitat[a]	Maximum Area of Potential Habitat Affected[b]			Overall Impact Magnitude[f] and Species-Specific Mitigation[g]
		Within SEZ Direct Effects)[c]	Outside SEZ (Indirect Effects)[d]	Within Transmission Corridor (Indirect and Direct Effects)[e]	
Upland Game Birds					
Gambel's quail (*Callipepla gambelii*)	Deserts, especially in areas with brushy or thorny growth, and adjacent cultivated areas. Usually occurs near water. Nests on the ground under cover of small trees, shrubs, and grass tufts. About 2,781,700 acres of potentially suitable habitat occurs within the SEZ region.	131 acres of potentially suitable habitat lost (0.005% of available potentially suitable habitat) during construction and operations	37,496 acres of potentially suitable habitat (1.3% of available potentially suitable habitat)	259 acres of potentially suitable habitat lost (0.01% of available potentially suitable habitat) and 5,211 acres in area of indirect effects	Small overall impact. Avoid wash and playa habitats.
Mourning dove (*Zenaida macrroura*)	Habitat generalist, occurring in grasslands, shrublands, croplands, lowland and foothill riparian forests, ponderosa pine forests, deserts, and urban and suburban areas. Rarely in aspen and other forests, coniferous woodlands, and alpine tundra. Nests on ground or in trees. Winters mostly in lowland riparian forests adjacent to cropland. About 4,379,500 acres of potentially suitable habitat occurs in the SEZ region.	3,848 acres of potentially suitable habitat lost (0.09% of available potentially suitable habitat) during construction and operations	85,865 acres of potentially suitable habitat (2.0% of available potentially suitable habitat)	584 acres of potentially suitable habitat lost (0.01% of available potentially suitable habitat) and 11,750 acres in area of indirect effects	Small overall impact. No species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects.

[a] Potentially suitable habitat was determined by using SWReGAP habitat suitability and land cover models. Area of potentially suitable habitat for each species is presented for the SEZ region, which is defined as the area within 50 mi (80 km) of the SEZ center.

[b] 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 and land cover models. This approach probably overestimates the amount of suitable habitat in the project area.

[c] Direct effects within the SEZ would consist of the ground-disturbing activities associated with construction and the maintenance of an altered environment associated with operations. A maximum of 3,848 acres (15.6 km^2) of direct effects within the SEZ was assumed.

Footnotes continued on next page.

TABLE 11.6.11.2-1 (Cont.)

[d] The area of indirect effects was assumed to be the area adjacent to the SEZ within 5 mi (8 km) of the SEZ boundary and within the 1-mi (1.6-km) wide transmission line corridor (less the assumed area of direct effects) that extends beyond the 5-mi (8-km) area adjacent to the SEZ boundary. Potentially suitable habitat within the SEZ greater than the maximum of 3,848 acres (15.6 km^2) of direct effects was also added to the area of indirect effects. Indirect effects include those from surface runoff, dust, noise, lighting, and so on from the SEZ, but do not include ground-disturbing activities. The potential degree of indirect effects would decrease with increasing distance from the SEZ.

[e] For transmission line development, direct effects were estimated within a 22-mi (35-km) long, 250-ft (76-m) wide ROW for an assumed new transmission line connecting to the nearest existing line. Indirect effects were estimated within a 1-mi (1.6-km) wide transmission corridor to the existing transmission line, less the assumed area of direct effects. Additional indirect effects for the transmission line only considered the 17-mi (27-km) long portion that extends outside of the 5 mi (8 km) area of indirect effects for the SEZ

[f] 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. Programmatic design features would reduce most indirect effects to negligible levels.

[g] 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.

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

Sources: CDFG (2008); NatureServe (2010); NDCNR (2002); USGS (2004, 2005a, 2007).

Birds of Prey

Section 4.10.2.2.4 provides an overview of the birds of prey (raptors, owls, and vultures) within the six-state study area. Twenty-seven bird of prey species have been reported from Iron County (Utah Ornithological Society 2007). Raptor species that could occur within the proposed Gold Point SEZ include the 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*) (CDFG 2008; NDCNR 2002; USGS 2007). Several special status birds of prey species are discussed in Section 11.6.12.

Upland Game Birds

Section 4.10.2.2.5 provides an overview of the upland game birds (primarily pheasants, grouse, quail, and doves) that occur within the six-state study area. Upland game species that could occur within the proposed Gold Point SEZ include the chukar (*Alectoris chukar*), Gambel's quail (*Callipepla gambelii*), and mourning dove (*Zenaida macroura*) (CDFG 2008; NDCNR 2002; USGS 2007).

Table 11.6.11.2-1 provides habitat information for representative bird species that could occur within the proposed Gold Point SEZ. Special status bird species are discussed in Section 11.6.12.

11.6.11.2.2 Impacts

The types of impacts that birds could incur from construction, operation, and decommissioning of utility-scale solar energy facilities are discussed in Section 5.10.2.1. Any such impacts would be minimized through the implementation of required programmatic design features described in Appendix A, Section A.2.2, and through the application of any additional mitigation measures. Section 11.6.11.2.3, below, identifies design features of particular relevance to the proposed Gold Point SEZ.

The assessment of impacts on bird species is based on available information on the presence of species in the affected area, as presented in Section 11.6.11.2.1 following the analysis approach described in Appendix M. Additional NEPA assessments and coordination with federal or state natural resource agencies may be needed to address project-specific impacts more thoroughly. These assessments and consultations could result in additional required actions to avoid or mitigate impacts on birds (see Section 11.6.11.2.3).

In general, impacts on birds would result from habitat disturbance (i.e., habitat reduction, fragmentation, and alteration), and from disturbance, injury, or mortality to individual birds. Table 11.6.11.2-1 summarizes the magnitude of potential impacts on representative bird species resulting from solar energy development in the proposed Gold Point SEZ. Direct impacts on all representative bird species would be small, as only 0.2% or less of potentially suitable habitats for the bird species would be lost (Table 11.6.11.2-1). Larger areas of potentially suitable habitat

for bird species occur within the area of potential indirect effects (e.g., up to 2.7% of potentially suitable habitat for the red-tailed hawk). Other impacts on birds could result from collision with vehicles and buildings, surface water and sediment runoff from disturbed areas, fugitive dust generated by project activities, noise, lighting, spread of invasive species, accidental spills, and harassment. Indirect impacts on areas outside the SEZ (e.g., impacts caused by dust generation, erosion, and sedimentation) are expected to be negligible with implementation of programmatic design features.

Decommissioning after operations cease could result in short-term negative impacts on individuals and habitats within and adjacent to the SEZ. The negative impacts of decommissioning would be reduced or eliminated as reclamation proceeds. Potentially long-term benefits could accrue as habitats are restored in previously disturbed areas. Section 5.10.2.1.4 provides an overview of the impacts of decommissioning and reclamation on wildlife. Of particular importance for bird species would be the restoration of original ground surface contours, soils, and native plant communities associated with desert scrub, playa, and wash habitats.

11.6.11.2.3 SEZ-Specific Design Features and Design Feature Effectiveness

The successful implementation of programmatic design features presented in Appendix A, Section A.2.2, would reduce the potential for effects on birds, especially for those species that depend on habitat types that can be avoided (e.g., wash and playa habitats). Indirect impacts could be reduced to negligible levels by implementing programmatic design features, especially those engineering controls that would reduce runoff, sedimentation, spills, and fugitive dust. While SEZ-specific design features important to reducing impacts on birds are best established when project details are considered, some design features can be identified at this time:

- The requirements contained within the 2010 Memorandum of Understanding between the BLM and USFWS to promote the conservation of migratory birds will be followed.

- Take of golden eagles and other raptors should be avoided. Mitigation regarding the golden eagle should be developed in consultation with the USFWS and the NDOW. A permit may be required under the Bald and Golden Eagle Protection Act.

- Wash and playa habitats should be avoided.

If these SEZ-specific design features are implemented in addition to the programmatic design features, impacts on bird species could be reduced. However, as potentially suitable habitats for a number of the bird species occur throughout much of the SEZ, additional species-specific mitigation of direct effects for those species would be difficult or infeasible.

11.6.11.3 Mammals

11.6.11.3.1 Affected Environment

This section addresses mammal species that are known to occur, or for which potentially suitable habitat occurs, on or within the potentially affected area of the proposed Gold Point SEZ. The list of mammal species potentially present in the SEZ area was determined from the Nevada Natural Heritage Program (NDCNR 2002) and range maps and habitat information available from the California Wildlife Habitat Relationships System (CDFG 2008) and the SWReGAP (USGS 2007). Land cover types suitable for each species were determined from the SWReGAP (USGS 2004, 2005a, 2007). Appendix M contains additional information on the approach used.

More than 55 species of mammals have ranges that encompass the area of the proposed Gold Point SEZ (NDCNR 2002; USGS 2007); however, suitable habitats for a number of these species are limited or nonexistent within the SEZ (USGS 2007). Similar to the overview of mammals provided for the six-state study area (Section 4.10.2.3), the following discussion for the SEZ emphasizes big game and other mammal species that (1) have key habitats within or near the SEZ, (2) are important to humans (e.g., big game, small game, and furbearer species), and/or (3) are representative of other species that share similar habitats.

Big Game

The big game species that could occur within the area of the proposed Gold Point SEZ include cougar (*Puma concolor*), elk (*Cervus canadensis*), mule deer (*Odocoileus hemionus*), Nelson's bighorn sheep (*Ovis canadensis nelsoni*), and pronghorn (*Antilocapra americana*) (CDFG 2008; NDCNR 2002; USGS 2007). Because of its special species status, Nelson's bighorn sheep is addressed in Section 11.6.12. Based on land cover, potentially suitable habitat for the cougar and mule deer occur throughout the SEZ; whereas, limited suitable habitat for elk and pronghorn occurs within the SEZ (Table 11.6.11.3-1). Figures 11.6.11.3-1 and 11.6.11.3-2 show the location of the SEZ relative to the mapped ranges of mule deer and pronghorn, respectively.

Other Mammals

A number of furbearers and small game mammal species occur within the area of the proposed Gold Point SEZ. Species that could occur within the area of the SEZ include the American badger (*Taxidea taxus*), black-tailed jackrabbit (*Lepus californicus*), bobcat (*Lynx rufus*), coyote (*Canis latrans*), desert cottontail (*Sylvilagus audubonii*), gray fox (*Urocyon cinereoargenteus*), kit fox (*Vulpes macrotis*), and red fox (*Vulpes vulpes*) (CDFG 2008; NDCNR 2002; USGS 2007).

TABLE 11.6.11.3-1 Habitats, Potential Impacts, and Potential Mitigation for Representative Mammal Species That Could Occur on or in the Affected Area of the Proposed Gold Point SEZ

Common Name (Scientific Name)	Habitat[a]	Maximum Area of Potential Habitat Affected[b]			Overall Impact Magnitude[f] and Species-Specific Mitigation[g]
		Within SEZ Direct Effects)[c]	Outside SEZ (Indirect Effects)[d]	Within Transmission Corridor (Indirect and Direct Effects)[e]	
Big Game					
Cougar *(Puma concolor)*	Most common in rough, broken foothills and canyon country, often in association with montane forests, shrublands, and pinyon-juniper woodlands. About 5,040,400 acres[h] of potentially suitable habitat occurs in the SEZ region.	3,848 acres of potentially suitable habitat lost (0.08% of available potentially suitable habitat) during construction and operations	98,059 acres of potentially suitable habitat (1.9% of available potentially suitable habitat)	648 acres of potentially suitable habitat lost (0.01% of available potentially suitable habitat) and 13,038 acres in area of indirect effects	Small overall impact. No species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects.
Elk *Cervis canadensis)*	Semi-open forest, mountain meadows, foothills, plains, valleys, and alpine tundra. Uses open spaces such as alpine pastures, marshy meadows, river flats, brushy clean cuts, forest edges, and semidesert areas. About 1,242,200 acres of potentially suitable habitat occurs in the SEZ region.	2 acres of potentially suitable habitat lost (<0.0002% of available potentially suitable habitat) during construction and operations	27,044 acres of potentially suitable habitat (2.2% of available potentially suitable habitat)	216 acres of potentially suitable habitat lost (0.02% of available potentially suitable habitat) and 4,346 acres in area of indirect effects	Small overall impact.

TABLE 11.6.11.3-1 (Cont.)

Common Name (Scientific Name)	Habitat[a]	Maximum Area of Potential Habitat Affected[b]			Overall Impact Magnitude[f] and Species-Specific Mitigation[g]
		Within SEZ Direct Effects)[c]	Outside SEZ (Indirect Effects)[d]	Within Transmission Corridor (Indirect and Direct Effects)[e]	
Big Game (Cont.)					
Mule deer *(Odocoileus hemionus)*	Most habitats, including coniferous forests, desert shrub, chaparral, and grasslands with shrubs. Greatest densities in shrublands on rough, broken terrain that provides abundant browse and cover. About 4,182,100 acres of potentially suitable habitat occurs in the SEZ region.	3,848 acres of potentially suitable habitat lost (0.09% of available potentially suitable habitat) during construction and operations	98,401 acres of potentially suitable habitat (2.4% of available potentially suitable habitat)	658 acres of potentially suitable habitat lost (0.02% of available potentially suitable habitat) and 13,239 acres in area of indirect effects	Small overall impact. No species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects.
Pronghorn *(Antilocapra americana)*	Grasslands and semidesert shrublands on rolling topography that affords good visibility. Most abundant in shortgrass or midgrass prairies and least common in xeric habitats. About 1,582,200 acres of potentially suitable habitat occurs in the SEZ region.	131 acres of potentially suitable habitat lost (0.008% of available potentially suitable habitat) during construction and operations	35,757 acres of potentially suitable habitat (2.2% of available potentially suitable habitat)	256 acres of potentially suitable habitat lost (0.02% of available potentially suitable habitat) and 5,151 acres in area of indirect effects	Small overall impact.

TABLE 11.6.11.3-1 (Cont.)

Common Name (Scientific Name)	Habitat[a]	Maximum Area of Potential Habitat Affected[b]: Within SEZ Direct Effects)[c]	Maximum Area of Potential Habitat Affected[b]: Outside SEZ (Indirect Effects)[d]	Maximum Area of Potential Habitat Affected[b]: Within Transmission Corridor (Indirect and Direct Effects)[e]	Overall Impact Magnitude[f] and Species-Specific Mitigation[g]
Small Game and Furbearers					
American badger *(Taxidea taxus)*	Open grasslands and deserts, meadows in subalpine and montane forests, alpine tundra. Digs burrows in friable soils. Most common in areas with abundant populations of ground squirrels, prairie dogs, and pocket gophers. About 4,698,400 acres of potentially suitable habitat occurs in the SEZ region.	3,848 acres of potentially suitable habitat lost (0.08% of available potentially suitable habitat) during construction and operations	98,882 acres of potentially suitable habitat (2.1% of available potentially suitable habitat)	658 acres of potentially suitable habitat lost (0.01% of available potentially suitable habitat) and 13,239 acres in area of indirect effects	Small overall impact. No species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects.
Black-tailed jackrabbit *(Lepus californicus)*	Open plains, fields, and deserts with scattered thickets or patches of shrubs. Also open, early stages of forests and chaparral habitats. Rests during the day in shallow depressions, and uses shrubs for cover. About 5,121,100 acres of potentially suitable habitat occurs in the SEZ region.	3,848 acres of potentially suitable habitat lost (0.08% of available potentially suitable habitat) during construction and operations	98,969 acres of potentially suitable habitat (1.9% of available potentially suitable habitat)	665 acres of potentially suitable habitat lost (0.01% of available potentially suitable habitat) and 13,380 acres in area of indirect effects	Small overall impact. No species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects.
Bobcat *(Lynx rufus)*	Most habitats except subalpine coniferous forest and montane meadow grasslands. Most common in rocky country from deserts through ponderosa forests. About 2,922,300 acres of potentially suitable habitat occurs in the SEZ region.	160 acres of potentially suitable habitat lost (0.005% of available potentially suitable habitat) during construction and operations	37,360 acres of potentially suitable habitat (1.3% of available potentially suitable habitat)	263 acres of potentially suitable habitat lost (0.009% of available potentially suitable habitat) and 5,292 acres in area of indirect effects	Small overall impact.

TABLE 11.6.11.3-1 (Cont.)

Common Name (Scientific Name)	Habitat[a]	Maximum Area of Potential Habitat Affected[b]: Within SEZ Direct Effects)[c]	Maximum Area of Potential Habitat Affected[b]: Outside SEZ (Indirect Effects)[d]	Maximum Area of Potential Habitat Affected[b]: Within Transmission Corridor (Indirect and Direct Effects)[e]	Overall Impact Magnitude[f] and Species-Specific Mitigation[g]
Small Game and Furbearers (Cont.)					
Coyote *(Canis latrans)*	All habitats at all elevations. Least common in dense coniferous forest. Where human control efforts occur, restricted to broken, rough country with abundant shrub cover and a good supply of rabbits or rodents. About 5,406,700 acres of potentially suitable habitat occurs in the SEZ region.	3,848 acres of potentially suitable habitat lost (0.07% of available potentially suitable habitat) during construction and operations	99,023 acres of potentially suitable habitat (1.8% of available potentially suitable habitat)	666 acres of potentially suitable habitat lost (0.01% of available potentially suitable habitat) and 13,400 acres in area of indirect effects	Small overall impact. No species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects.
Desert cottontail *(Sylvilagus audubonii)*	Abundant to common in grasslands, open forests, and desert shrub habitats. Can occur in areas with minimal vegetation as long as adequate cover (e.g., rock piles, fallen logs, fence rows) is present. Thickets and patches of shrubs, vines, and brush also used as cover. About 4,302,400 acres of potentially suitable habitat occurs in the SEZ region.	3,848 acres of potentially suitable habitat lost (0.1% of available potentially suitable habitat) during construction and operations	110,264 acres of potentially suitable habitat (2.5% of available potentially suitable habitat)	94 acres of potentially suitable habitat lost (0.002% of available potentially suitable habitat) and 1,884 acres in area of indirect effects	Small overall impact. No species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects.
Gray fox *(Urocyon cinereoargenteus)*	Deserts, open forests and brush. Prefer wooded areas, broken country, brushlands, and rocky areas. Tolerant of low levels of residential development. About 3,572,000 acres of potentially suitable habitat occurs in the SEZ region.	3,848 acres of potentially suitable habitat lost (0.1% of available potentially suitable habitat) during construction and operations	70,473 acres of potentially suitable habitat (2.0% of available potentially suitable habitat)	442 acres of potentially suitable habitat lost (0.01% of available potentially suitable habitat) and 8,893 acres in area of indirect effects	Small overall impact. No species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects.

TABLE 11.6.11.3-1 (Cont.)

Common Name (Scientific Name)	Habitat[a]	Maximum Area of Potential Habitat Affected[b]			Overall Impact Magnitude[f] and Species-Specific Mitigation[g]
		Within SEZ Direct Effects)[c]	Outside SEZ (Indirect Effects)[d]	Within Transmission Corridor (Indirect and Direct Effects)[e]	
Small Game and Furbearers (Cont.)					
Kit fox *(Vulpes macrotis)*	Desert and semidesert areas with relatively open vegetative cover and soft soils. Seeks shelter in underground burrows. About 4,227,900 acres of potentially suitable habitat occurs in the SEZ region.	3,848 acres of potentially suitable habitat lost (0.09% of available potentially suitable habitat) during construction and operations	97,683 acres of potentially suitable habitat (2.3% of available potentially suitable habitat)	648 acres of potentially suitable habitat lost (<0.002% of available potentially suitable habitat) and 13,038 acres in area of indirect effects	Small overall impact. No species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects.
Red fox *(Vulpes vulpes)*	Most common in open woodlands, pasturelands, riparian areas, and agricultural lands. About 2,610,500 acres of potentially suitable habitat occurs in the SEZ region.	54 acres of potentially suitable habitat lost (0.002% of available potentially suitable habitat) during construction and operations	35,736 acres of potentially suitable habitat (1.4% of available potentially suitable habitat)	253 acres of potentially suitable habitat lost (0.01% of available potentially suitable habitat) and 5,090 acres in area of indirect effects	Small overall impact.

TABLE 11.6.11.3-1 (Cont.)

Common Name (Scientific Name)	Habitat[a]	Maximum Area of Potential Habitat Affected[b]			Overall Impact Magnitude[f] and Species-Specific Mitigation[g]
		Within SEZ Direct Effects)[c]	Outside SEZ (Indirect Effects)[d]	Within Transmission Corridor (Indirect and Direct Effects)[e]	
Nongame (small) Mammals					
Big brown bat *(Eptesicus fuscus)*	Most habitats from lowland deserts to timberline meadows. Roosts in hollow trees, rock crevices, mines, tunnels, and buildings. About 3,535,300 acres of potentially suitable habitat occurs in the SEZ region.	3,848 acres of potentially suitable habitat lost (0.1% of available potentially suitable habitat) during construction and operations	70,572 acres of potentially suitable habitat (2.0% of available potentially suitable habitat)	447 acres of potentially suitable habitat lost (0.01% of available potentially suitable habitat) and 8,994 acres in area of indirect effects	Small overall impact. No species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects.
Botta's pocket gopher *(Thomomys bottae)*	Variety of habitats, including shortgrass plains, oak savanna, agricultural lands, and deserts. Burrows are more common in disturbed areas such as roadways and stream floodplains. About 3,382,300 acres of potentially suitable habitat occurs in the SEZ region.	3,848 acres of potentially suitable habitat lost (0.1% of available potentially suitable habitat) during construction and operations	84,339 acres of potentially suitable habitat (2.5% of available potentially suitable habitat)	579 acres of potentially suitable habitat lost (0.02% of available potentially suitable habitat) and 11,649 acres in area of indirect effects	Small overall impact. No species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects.
Brazilian free-tailed bat *(Tadarida brasiliensis)*	Cliffs, deserts, grasslands, old fields, savannas, shrublands, woodlands, and suburban/urban areas. Roosts in buildings, caves, and hollow trees. May roost in rock crevices, bridges, signs, or cliff swallow nests during migration. Large maternity colonies inhabit caves, buildings, culverts, and bridges. About 4,307,900 acres of potentially suitable habitat occurs in the SEZ region.	3,848 acres of potentially suitable habitat lost (0.09% of available potentially suitable habitat) during construction and operations	84,574 acres of potentially suitable habitat (2.0% of available potentially suitable habitat)	587 acres of potentially suitable habitat lost (0.01% of available potentially suitable habitat) and 11,810 acres in area of indirect effects	Small overall impact. No species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects.

TABLE 11.6.11.3-1 (Cont.)

Common Name (Scientific Name)	Habitat[a]	Maximum Area of Potential Habitat Affected[b]			Overall Impact Magnitude[f] and Species-Specific Mitigation[g]
		Within SEZ Direct Effects)[c]	Outside SEZ (Indirect Effects)[d]	Within Transmission Corridor (Indirect and Direct Effects)[e]	
Nongame (small) Mammals (Cont.)					
Cactus mouse *(Peromyscus eremicus)*	Variety of areas, including desert scrub, semidesert chaparral, desert wash, semidesert grassland, and cliff and canyon habitats. About 1,780,400 acres of potentially suitable habitat occurs in the SEZ region.	129 acres of potentially suitable habitat lost (0.007% of available potentially suitable habitat) during construction and operations	10,537 acres of potentially suitable habitat (0.6% of available potentially suitable habitat)	43 acres of potentially suitable habitat lost (0.002% of available potentially suitable habitat) and 865 acres in area of indirect effects	Small overall impact. Avoid wash habitat.
California myotis *(Myotis californicus)*	Desertscrub, semidesert shrublands, lowland riparian, swamps, riparian suburban areas, plains grasslands, scrub-grasslands, woodlands, and forests. Roosts in caves, mine tunnels, hollow trees, and loose rocks. About 3,780,400 acres of potentially suitable habitat occurs in the SEZ region.	3,848 acres of potentially suitable habitat lost (0.1% of available potentially suitable habitat) during construction and operations	84,339 acres of potentially suitable habitat (2.2% of available potentially suitable habitat)	579 acres of potentially suitable habitat lost (0.015% of available potentially suitable habitat) and 11,649 acres in area of indirect effects	Small overall impact. No species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects.
Canyon mouse *(Peromyscus crinitus)*	Associated with rocky substrates in a variety of habitats including desert scrub, sagebrush shrublands, woodlands, cliffs and canyons, and volcanic rock and cinder lands. Source of free water not required. About 2,124,200 acres of potentially suitable habitat occurs in the SEZ region.	2 acres of potentially suitable habitat lost (<0.0001% of available potentially suitable habitat) during construction and operations	28,421 acres of potentially suitable habitat (1.3% of available potentially suitable habitat)	216 acres of potentially suitable habitat lost (0.01% of available potentially suitable habitat) and 4,346 acres in area of indirect effects	Small overall impact.

TABLE 11.6.11.3-1 (Cont.)

Common Name (Scientific Name)	Habitat[a]	Maximum Area of Potential Habitat Affected[b]			Overall Impact Magnitude[f] and Species-Specific Mitigation[g]
		Within SEZ Direct Effects)[c]	Outside SEZ (Indirect Effects)[d]	Within Transmission Corridor (Indirect and Direct Effects)[e]	
Nongame (small) Mammals (Cont.)					
Deer mouse *(Peromyscus maniculatus)*	Tundra; alpine and subalpine grasslands; plains grasslands; open, sparsely vegetated deserts; warm temperate swamps and riparian forests; and Sonoran desert scrub habitats. About 4,976,700 acres of potentially suitable habitat occurs in the SEZ region.	3,848 acres of potentially suitable habitat lost (0.08% of available potentially suitable habitat) during construction and operations	98,741 acres of potentially suitable habitat (2.0% of available potentially suitable habitat)	656 acres of potentially suitable habitat lost (0.01% of available potentially suitable habitat) and 13,199 acres in area of indirect effects	Small overall impact. No species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects.
Desert shrew *(Notiosorex crawfordi)*	Usually in arid areas with adequate cover such as semiarid grasslands, shortgrass plains, desert scrub, chaparral slopes, shortgrass plains, oak savannas and woodlands, and alluvial fans. About 3,479,900 acres of potentially suitable habitat occurs in the SEZ region.	3,848 acres of potentially suitable habitat lost (0.1% of available potentially suitable habitat) during construction and operations	71,340 acres of potentially suitable habitat (2.1% of available potentially suitable habitat)	440 acres of potentially suitable habitat lost (0.01% of available potentially suitable habitat) and 8,853 acres in area of indirect effects	Small overall impact. No species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects.

TABLE 11.6.11.3-1 (Cont.)

Common Name (Scientific Name)	Habitat[a]	Maximum Area of Potential Habitat Affected[b]			Overall Impact Magnitude[f] and Species-Specific Mitigation[g]
		Within SEZ Direct Effects)[c]	Outside SEZ (Indirect Effects)[d]	Within Transmission Corridor (Indirect and Direct Effects)[e]	
Nongame (small) Mammals (Cont.)					
Desert woodrat *(Neotoma lepida)*	Sagebrush scrub; chaparral; deserts and rocky slopes with scattered cactus, yucca, pine-juniper, or other low vegetation; creosotebush desert; Joshua tree woodlands; scrub oak woodlands, pinyon-juniper woodlands; and riparian zones. Dens built of debris on ground, among cacti or yucca, along cliffs, among rocks, or occasionally in trees. About 5,231,800 acres of potentially suitable habitat occurs in the SEZ region.	3,848 acres of potentially suitable habitat lost (0.07% of available potentially suitable habitat) during construction and operations	98,747 acres of potentially suitable habitat (1.9% of available potentially suitable habitat)	656 acres of potentially suitable habitat lost (0.01% of available potentially suitable habitat) and 13,199 acres in area of indirect effects	Small overall impact. No species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects.
Hoary bat *(Lasiurus cinereus)*	Chaparral, shortgrass plains, scrub-grassland, desertscrub, forests and woodlands. Usually roosts in trees, also in caves, rock crevices, and houses. About 1,799,700 acres of potentially suitable habitat occurs in the SEZ region.	158 acres of potentially suitable habitat lost (0.009% of available potentially suitable habitat) during construction and operations	9,379 acres of potentially suitable habitat (0.5% of available potentially suitable habitat)	50 acres of potentially suitable habitat lost (0.003% of available potentially suitable habitat) and 1,006 acres in area of indirect effects	Small overall impact.

TABLE 11.6.11.3-1 (Cont.)

Common Name (Scientific Name)	Habitat[a]	Maximum Area of Potential Habitat Affected[b]			Overall Impact Magnitude[f] and Species-Specific Mitigation[g]
		Within SEZ Direct Effects)[c]	Outside SEZ (Indirect Effects)[d]	Within Transmission Corridor (Indirect and Direct Effects)[e]	
Nongame (small) Mammals (Cont.)					
Little pocket mouse *(Perognathus longimembris)*	Mostly sandy and gravelly soils, but also stony soils and rarely rocky sites. About 2,314,300 acres of potentially suitable habitat occurs in the SEZ region.	25 acres of potentially suitable habitat lost (0.001% of available potentially suitable habitat) during construction and operations	36,543 acres of potentially suitable habitat (1.6% of available potentially suitable habitat)	248 acres of potentially suitable habitat lost (0.01% of available potentially suitable habitat) and 4,990 acres in area of indirect effects	Small overall impact.
Long-legged myotis *(Myotis volans)*	Prefers pine forest, desert, and riparian habitats. Old buildings, rock crevices, and hollow trees are used for daytime roosting and winter hibernation. Forages in open areas, such as forest clearings. About 3,605,000 acres of potentially suitable habitat occurs within the SEZ region.	3,848 acres of potentially suitable habitat lost (0.1% of available potentially suitable habitat) during construction and operations	70,925 acres of potentially suitable habitat (2.0% of available potentially suitable habitat)	449 acres of potentially suitable habitat lost (0.01% of available potentially suitable habitat) and 9,034 acres in area of indirect effects	Small overall impact. No species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects.
Merriam's kangaroo rat *(Dipodomys merriami)*	Plains grasslands, scrub-grasslands, desertscrub, shortgrass plains, oak and juniper savannas, mesquite dunes, and creosote flats. About 4,206,900 acres of potentially suitable habitat occurs in the SEZ region.	3,848 acres of potentially suitable habitat lost (0.09% of available potentially suitable habitat) during construction and operations	98,387 acres of potentially suitable habitat (2.3% of available potentially suitable habitat)	655 acres of potentially suitable habitat lost (0.02% of available potentially suitable habitat) and 13,179 acres in area of indirect effects	Small overall impact. No species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects.

TABLE 11.6.11.3-1 (Cont.)

Common Name (Scientific Name)	Habitat[a]	Maximum Area of Potential Habitat Affected[b]			Overall Impact Magnitude[f] and Species-Specific Mitigation[g]
		Within SEZ Direct Effects)[c]	Outside SEZ (Indirect Effects)[d]	Within Transmission Corridor (Indirect and Direct Effects)[e]	
Nongame (small) Mammals (Cont.)					
Northern grasshopper mouse *(Onychomys leucogaster)*	Occurs in grasslands, sagebrush deserts, overgrazed pastures, weedy roadside ditches, sand dunes, and other habitats with sandy soil and sparse vegetation. About 2,793,700 acres of potentially suitable habitat occurs within the SEZ region.	25 acres of potentially suitable habitat lost (<0.001% of available potentially suitable habitat) during construction and operations	36,637 acres of potentially suitable habitat (1.3% of available potentially suitable habitat)	248 acres of potentially suitable habitat lost (0.009% of available potentially suitable habitat) and 4,990 acres in area of indirect effects	Small overall impact.
Silver-haired bat *(Lasionycteris noctivagans)*	Urban areas, chaparral, alpine and subalpine grasslands, forests, scrub-grassland, oak savanna and desertscrub habitats. Roosts under bark, in hollow trees, caves and mines. Forages over clearings and open water. About 4,252,200 acres of potentially suitable habitat occurs in the SEZ region.	3,848 acres of potentially suitable habitat lost (0.09% of available potentially suitable habitat) during construction and operations	84,170 acres of potentially suitable habitat (2.0% of available potentially suitable habitat)	579 acres of potentially suitable habitat lost (0.01% of available potentially suitable habitat) and 11,649 acres in area of indirect effects	Small overall impact. No species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects.
Southern grasshopper mouse *(Onychomys torridus)*	Low, arid, shrub and semiscrub vegetation of deserts. About 2,882,400 acres of potentially suitable habitat occurs within the SEZ region.	3,848 acres of potentially suitable habitat lost (0.1% of available potentially suitable habitat) during construction and operations	70,577 acres of potentially suitable habitat (2.4% of available potentially suitable habitat)	430 acres of potentially suitable habitat lost (0.015% of available potentially suitable habitat) and 8,652 acres in area of indirect effects	Small overall impact. No species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects.

TABLE 11.6.11.3-1 (Cont.)

Common Name (Scientific Name)	Habitat[a]	Maximum Area of Potential Habitat Affected[b]			Overall Impact Magnitude[f] and Species-Specific Mitigation[g]
		Within SEZ Direct Effects)[c]	Outside SEZ (Indirect Effects)[d]	Within Transmission Corridor (Indirect and Direct Effects)[e]	
Nongame (small) Mammals (Cont.)					
Western pipistrelle *(Parastrellus esperus)*	Deserts and lowlands, desert mountain ranges, desert scrub flats, and rocky canyons. Roosts mostly in rock crevices, sometimes mines and caves, and rarely in buildings. Suitable roosts occur in rocky canyons and cliffs. Most abundant bat in desert regions. About 3,726,700 acres of potentially suitable habitat occurs in the SEZ region.	3,848 acres of potentially suitable habitat lost (0.1% of available potentially suitable habitat) during construction and operations	84,495 acres of potentially suitable habitat (2.3% of available potentially suitable habitat)	587 acres of potentially suitable habitat lost (0.02% of available potentially suitable habitat) and 11,810 acres in area of indirect effects	Small overall impact. No species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects.
White-tailed antelope squirrel *(Ammospermophilus leucurus)*	Low deserts, semidesert and montane shrublands, plateaus, and foothills in areas with sparse vegetation and hard gravelly surfaces. Spends nights and other periods of inactivity in underground burrows. About 3,735,000 acres of potentially suitable habitat occurs within the SEZ region.	3,848 acres of potentially suitable habitat lost (0.1% of available potentially suitable habitat) during construction and operations	84,085 acres of potentially suitable habitat (2.3% of available potentially suitable habitat)	516 acres of potentially suitable habitat lost (0.01% of available potentially suitable habitat) and 10,382 acres in area of indirect effects	Small overall impact. No species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects.

TABLE 11.6.11.3-1 (Cont.)

Common Name (Scientific Name)	Habitat[a]	Maximum Area of Potential Habitat Affected[b]			Overall Impact Magnitude[f] and Species-Specific Mitigation[g]
		Within SEZ Direct Effects)[c]	Outside SEZ (Indirect Effects)[d]	Within Transmission Corridor (Indirect and Direct Effects)[e]	
Nongame (small) Mammals (Cont.)					
Yuma myotis *(Myotis yumanensis)*	Riparian areas, grasslands, semidesert shrubland, mountain brush, woodlands, and deserts. Occurs where there is open water, regardless of the habitat. Roosts in caves, mines, cliffs, crevices, buildings, and swallow nests. About 3,762,800 acres of potentially suitable habitat occurs in the SEZ region.	3,848 acres of potentially suitable habitat lost (0.1% of available potentially suitable habitat) during construction and operations	83,651 acres of potentially suitable habitat (2.2% of available potentially suitable habitat)	571 acres of potentially suitable habitat lost (0.015% of available potentially suitable habitat) and 11,489 acres in area of indirect effects	Small overall impact. No species-specific mitigation of direct effects is feasible, because suitable habitat is widespread in the area of direct effects.

[a] Potentially suitable habitat was determined by using SWReGAP habitat suitability and land cover models. Area of potentially suitable habitat for each species is presented for the SEZ region, which is defined as the area within 50 mi (80 km) of the SEZ center.

[b] 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 and land cover models. This approach probably overestimates the amount of suitable habitat in the project area. A maximum of 3,848 acres (15.6 km^2) of direct effects within the SEZ was assumed.

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

[d] The area of indirect effects was assumed to be the area adjacent to the SEZ within 5 mi (8 km) of the SEZ boundary and within the 1-mi (1.6-km) wide transmission line corridor (less the assumed area of direct effects) that extends beyond the 5-mi (8-km) area adjacent to the SEZ boundary. Potentially suitable habitat within the SEZ greater than the maximum of 3,848 acres (15.6 km^2) of direct effects was also added to the area of indirect effects. Indirect effects include those from surface runoff, dust, noise, lighting, and so on from the SEZ, but do not include ground-disturbing activities. The potential degree of indirect effects would decrease with increasing distance from the SEZ.

[e] For transmission line development, direct effects were estimated within a 22-mi (35-km) long, 250-ft (76-m) wide ROW for an assumed new transmission line connecting to the nearest existing line. Indirect effects were estimated within a 1-mi (1.6-km) wide transmission corridor to the existing transmission line, less the assumed area of direct effects. Additional indirect effects for the transmission line only considered the 17-mi (27-km) long portion that extends outside of the 5 mi (8 km) area of indirect effects for the SEZ

Footnotes continued on next page.

TABLE 11.6.11.3-1 (Cont.)

[f] 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. Programmatic design features would reduce most indirect effects to negligible levels.

[g] 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.

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

Sources: CDFG (2008); NatureServe (2010); NDCNR (2002); USGS (2004, 2005a, 2007).

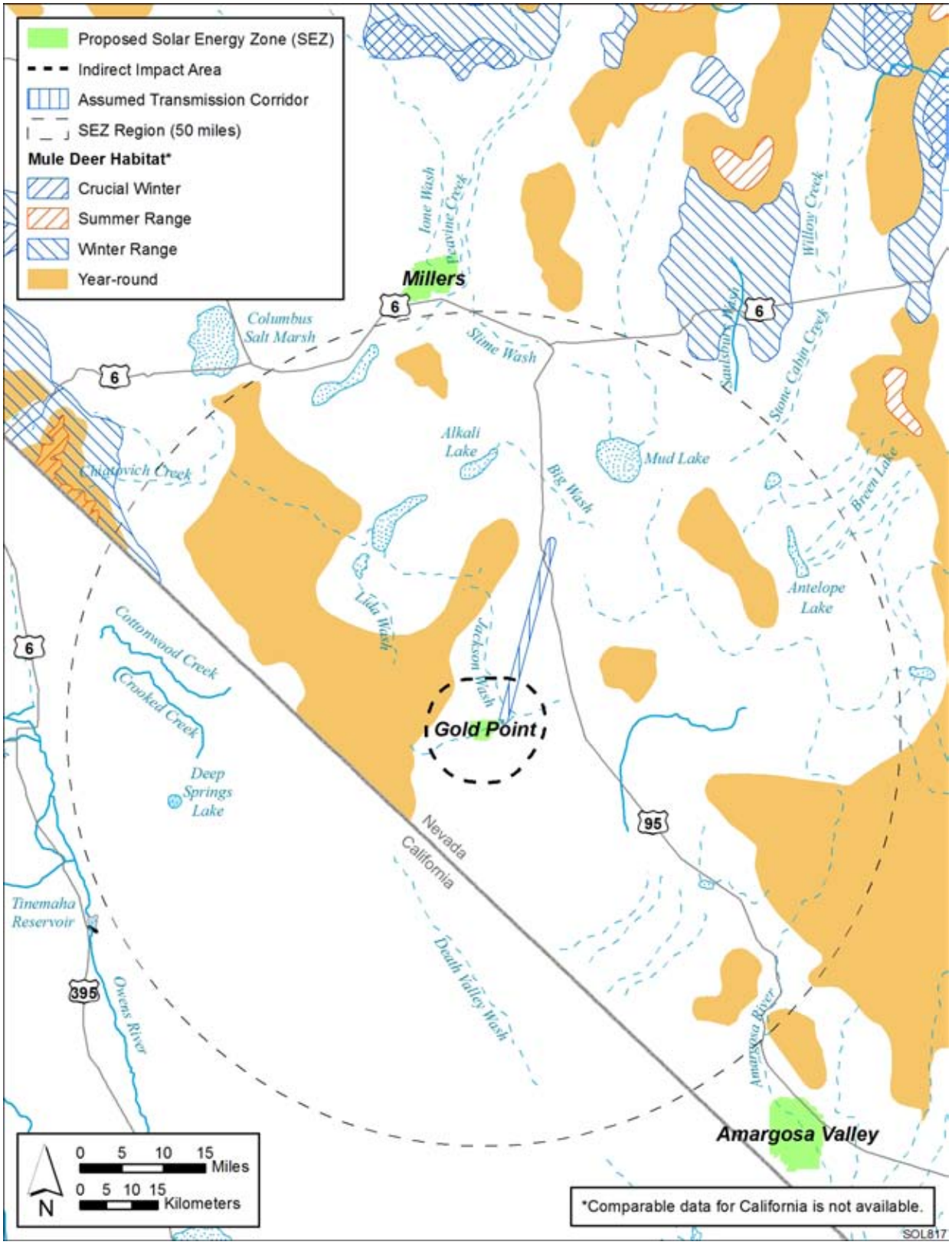

FIGURE 11.6.11.3-1 Location of the Proposed Gold Point SEZ Relative to the Mapped Range of Mule Deer (Source: NDOW 2010)

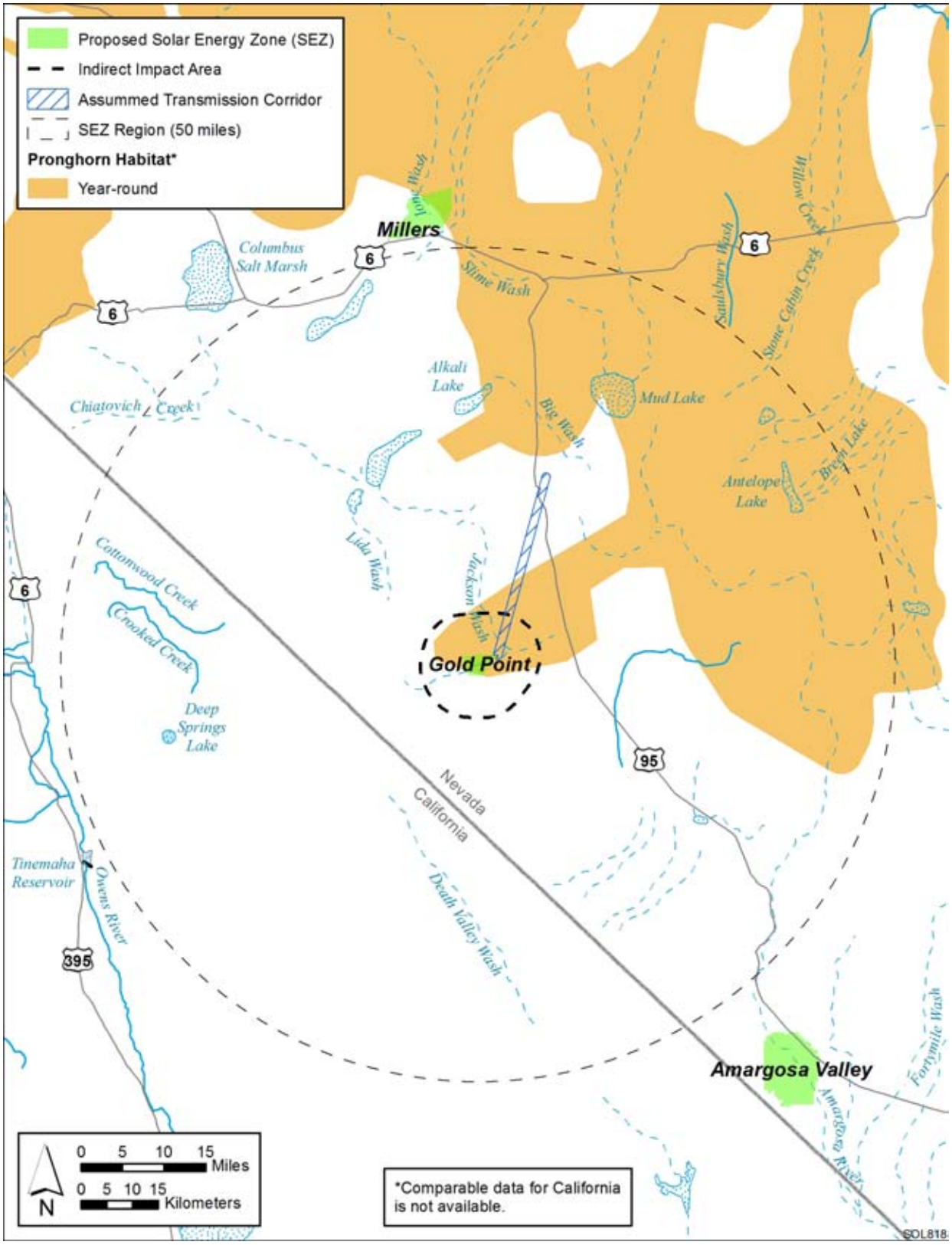

FIGURE 11.6.11.3-2 Location of the Proposed Gold Point SEZ Relative to the Mapped Range of Pronghorn (Source: NDOW 2010)

The nongame (small) mammals include bats, rodents, and shrews. Representative species for which potentially suitable habitat occurs within the proposed Gold Point SEZ include 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*), little pocket mouse (*Perognathus longimembris*), Merriam's pocket mouse (*Dipodomys merriami*), northern grasshopper mouse (*Onychomys leucogaster*), southern grasshopper mouse (*O. torridus*), and white-tailed antelope squirrel (*Ammospermophilus leucurus*) (CDFG 2008; NDCNR 2002; USGS 2007). 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*) (CDFG 2008; NDCNR 2002; USGS 2007). However, roost sites for the bat species (e.g., caves, hollow trees, rock crevices, or buildings) would be limited or absent within the SEZ. Several other special status bat species that could occur within the SEZ area are addressed in Section 11.6.12.

Table 11.6.11.3-1 provides habitat information for representative mammal species that could occur within the proposed Gold Point SEZ. Special status mammal species are discussed in Section 11.6.12.

11.6.11.3.2 Impacts

The types of impacts that mammals could incur from construction, operation, and decommissioning of utility-scale solar energy facilities are discussed in Section 5.10.2.1. Any such impacts would be minimized through the implementation of required programmatic design features described in Appendix A, Section A.2.2, and through the application of any additional mitigation measures. Section 11.6.11.3.3, below, identifies design features of particular relevance to mammals for the proposed Gold Point SEZ.

The assessment of impacts on mammal species is based on available information on the presence of species in the affected area as presented in Section 11.6.11.3.1, following the analysis approach described in Appendix M. Additional NEPA assessments and coordination with state natural resource agencies may be needed to address project-specific impacts more thoroughly. These assessments and consultations could result in additional required actions to avoid or mitigate impacts on mammals (see Section 11.6.11.3.3). Table 11.6.11.3-1 summarizes the magnitude of potential impacts on representative mammal species resulting from solar energy development (with the inclusion of programmatic design features) in the proposed Gold Point SEZ.

Cougar

Up to 3,848 acres (15.6 km^2) of potentially suitable cougar habitat could be lost by solar energy development within the proposed Gold Point SEZ and another 648 acres (2.6 km^2) by transmission line construction. This represents about 0.09% of potentially suitable cougar habitat

within the SEZ region. More than 98,000 acres (396 km^2) of potentially suitable cougar habitat occurs within the area of indirect effects. Overall, impacts on cougar from solar energy development in the SEZ would be small.

Elk

Only 2 acres (0.008 km^2) of potentially suitable elk habitat could be lost by solar energy development within the proposed Gold Point SEZ and another 216 acres (0.9 km^2) by transmission line construction. This represents about 0.02% of potentially suitable elk habitat within the SEZ region. More than 27,000 acres (109 km^2) of potentially suitable elk habitat occurs within the area of indirect effects. No mapped elk range occurs near the SEZ (NDOW 2010). Overall, impacts on elk from solar energy development in the SEZ would be small.

Mule Deer

Based on land cover analyses, up to 3,848 acres (15.6 km^2) of potentially suitable mule deer habitat could be lost by solar energy development within the proposed Gold Point SEZ and another 658 acres (2.7 km^2) by transmission line construction. This represents about 0.1% of potentially suitable mule deer habitat within the SEZ region. More than 98,000 acres (396 km^2) of potentially suitable mule deer habitat occurs within the area of indirect effects. Based on mapped range, the closest year-round mule deer habitat is about 4.0 mi (6.4 km) from the SEZ (Figure 11.6.11.3-1). About 4,560 acres (18.5 km^2) of year-round mule deer habitat occurs within the area of indirect effects. This is about 0.6% of the year-round mule deer habitat within the SEZ region. The closest summer range, winter range, and crucial winter ranges are over 40 mi (64 km) from the SEZ (Figure 11.6.11.3-1). Thus, no direct or indirect effects on these mule deer ranges would occur. Overall, impacts on mule deer from solar energy development in the SEZ would be small.

Pronghorn

Based on land cover analyses, about 130 acres (0.5 km^2) of potentially suitable pronghorn habitat could be lost by solar energy development within the proposed Gold Point SEZ and another 256 acres (1.0 km^2) by transmission line construction. This represents about 0.03% of potentially suitable pronghorn habitat within the SEZ region. Fewer than 35,800 acres (145 km^2) of potentially suitable pronghorn habitat occurs within the area of indirect effects. Based on mapped range, year-round pronghorn habitat occurs within the SEZ (Figure 11.6.11.3-2). Over 4,430 acres (17.9 km^2) of year-round habitat occurs within the SEZ; therefore, up to 3,848 acres (15.6 km^2) could be lost by solar energy development within the SEZ and about 300 acres (1.2 km^2) could be lost by construction of the proposed transmission line. These losses would total about 0.3% of the year-round pronghorn range within the SEZ region. About 45,630 acres (185 km^2) of year-round pronghorn habitat occurs within the area of indirect effects. This is about 3.9% of the year-round pronghorn habitat within the SEZ region. Overall, impacts on pronghorn from solar energy development in the SEZ would be small.

Other Mammals

Direct impacts on small game, furbearers, and nongame (small) mammal species would be small, as about 0.01 to 0.1% of potential habitats identified for the representative species would be lost by solar energy development within the SEZ and associated transmission line construction (Table 11.6.11.3-1). Larger areas of potentially suitable habitat for these species occur within the area of potential indirect effects (i.e., ranging from 0.5% for the hoary bat to 2.5% for the desert cottontail and Botta's pocket gopher).

Summary of Impacts on Mammals

Overall, direct impacts on mammal species would be small for all species, as only 0.1% or less of potentially suitable habitats for the representative mammal species would be lost (Table 11.6.11.3-1). Larger areas of potentially suitable habitat for mammal species occur within the area of potential indirect effects (e.g., up to 2.5% for the desert cottontail and Botta's pocket gopher). Other impacts on mammals could result from collision with vehicles and facilities (e.g., fences), surface water and sediment runoff from disturbed areas, fugitive dust generated by project activities, noise, lighting, spread of invasive species, accidental spills, and harassment. Indirect impacts on areas outside the SEZ (e.g., impacts caused by dust generation, erosion, and sedimentation) would be negligible with implementation of programmatic design features.

Decommissioning after operations cease could result in short-term negative impacts on individuals and habitats within and adjacent to the SEZ. The negative impacts of decommissioning would be reduced or eliminated as reclamation proceeds. Potentially long-term benefits could accrue as habitats are restored in previously disturbed areas. Section 5.10.2.1.4 provides an overview of the impacts of decommissioning and reclamation on wildlife. Of particular importance for mammal species would be the restoration of original ground surface contours, soils, and native plant communities associated with semiarid shrublands.

11.6.11.3.3 SEZ-Specific Design Features and Design Feature Effectiveness

The implementation of required programmatic design features presented in Appendix A, Section A.2.2, would reduce the potential for effects on mammals. Indirect impacts could be reduced to negligible levels by implementing programmatic design features, especially those engineering controls that would reduce runoff, sedimentation, spills, and fugitive dust. While SEZ-specific design features important for reducing impacts on mammals are best established when considering specific project details, design features that can be identified at this time are:

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

- Wash and playa habitats should be avoided.

If these SEZ-specific design features are implemented in addition to the programmatic design features, impacts on mammals could be reduced. However, potentially suitable habitats for a number of the mammal species occur throughout much of the SEZ; therefore, species-specific mitigation of direct effects for those species would be difficult or infeasible.

11.6.11.4 Aquatic Biota

11.6.11.4.1 Affected Environment

The proposed Gold Point SEZ is in a desert valley where surface waters are typically limited to ephemeral and intermittent washes that contain water only for short periods during or following precipitation. No perennial streams or water bodies are present in the proposed Gold Point SEZ or within the area of direct effects associated with the proposed new transmission line corridor. Approximately 3 mi (5 km) of an unnamed intermittent stream runs through the center of the SEZ and flows into the intermittent Jackson Wash. Several ephemeral streams also cross the SEZ, flowing to the northeast and terminating in dry lakes. In addition, the presumed new transmission line (250 ft [76 m] wide) would cross the intermittent Jackson Wash. The intermittent and ephemeral streams within the area of direct effects flow primarily in response to rainfall and typically do not support wetland or riparian habitats or flow into perennial surface waters. Although not considered aquatic habitat, such nonpermanent surface waters may contain invertebrates that are either aquatic opportunists (i.e., species that occupy both temporary and permanent waters) or specialists adapted to living in temporary aquatic environments (Graham 2001). On the basis of information from ephemeral pools in the American Southwest, ostracods (seed shrimp) and small planktonic crustaceans (e.g., copepods or cladocerans) may be present, and larger branchiopod crustaceans such as fairy shrimp could occur (Graham 2001). Various types of insects that have aquatic larval stages, such as dragonflies and a variety of midges and other fly larvae, may also occur depending on the duration of standing water, the distance to permanent water features, and the abundance of other invertebrates for prey (Graham 2001). The NWI mapping does not indicate any wetlands within the Gold Point SEZ (USFWS 2009).

No perennial streams or water bodies are present within the area of indirect effects associated with the proposed Gold Point SEZ or the presumed new transmission line corridor. There are 8 mi (13 km) of the intermittent Jackson Wash and 8 mi (13 km) of an unnamed intermittent stream present within the area of indirect effects associated with the SEZ. In addition, the 1-mi (2-km) area of indirect effects associated with the proposed new transmission line corridor crosses over Jackson Wash. Washes within the area of indirect effects are typically dry and do not flow into any perennial surface waters. There are also several ephemeral streams within the area of indirect effects. Although typically dry, such ephemeral and intermittent habitat may contain opportunistic crustaceans and aquatic insect larvae. The National Wetlands Inventory mapping does not indicate any wetlands within the area of indirect effects associated with the Gold Point SEZ (USFWS 2009).

Outside of the indirect effects area, but within 50 mi (80 km) of the proposed Gold Point SEZ, are approximately 70 mi (113 km) of perennial streams and 449 mi (723 km) of intermittent streams, 44,389 acres (180 km^2) of dry lakes and 1,255 acres (5 km^2) of intermittent lakes. The nearest permanent surface water is more than 14 mi (22 km) from the SEZ. Intermittent streams are the only surface water feature in the area of direct and indirect effects, and their area represents approximately 0.7 % of the total amount of intermittent stream present in the 50-mi (80-km) SEZ region.

11.6.11.4.2 Impacts

Because surface water habitats are a unique feature in the arid landscape in the vicinity of the proposed Gold Point SEZ, the maintenance and protection of such habitats may be important to the survival of aquatic and terrestrial organisms. The types of impacts that aquatic habitats and biota could incur from the development of utility-scale solar energy facilities are described in detail in Section 5.10.3. Aquatic habitats present on or near the locations selected for construction of solar energy facilities could be affected in a number of ways, including (1) direct disturbance, (2) deposition of sediments, (3) changes in water quantity, and (4) degradation of water quality.

There are no permanent water bodies, streams, or wetlands within the area of direct or indirect effects associated with the proposed Gold Point SEZ or the presumed new transmission line corridors, and consequently there would be no direct impacts on aquatic habitat from solar energy development. There are intermittent and ephemeral streams in the area of direct and indirect effects associated with the SEZ and presumed new transmission line corridor, and ground disturbance associated with solar development could increase the transport of soil into these streams via water- and airborne pathways. However, intermittent and ephemeral streams in the area of direct and indirect effects are typically dry and are not expected to support aquatic habitat or communities, nor do they flow into perennial surface waters. It is unlikely that significant airborne dust associated with ground disturbance within the SEZ would reach aquatic habitat, given the large distance from the SEZ to the nearest stream (14 mi [22 km]). However, fugitive dust could be minimized using the appropriate dust suppression measures as needed.

In arid environments, reductions in the quantity of water in aquatic habitats are of particular concern. Water quantity in aquatic habitats could also be affected if significant amounts of surface water or groundwater are utilized for power plant cooling water, for washing mirrors, or for other needs. The greatest need for water would occur if technologies employing wet cooling, such as parabolic trough or power tower, were developed at the site; the associated impacts would ultimately depend on the water source used (including groundwater from aquifers at various depths). There are no surface water habitats on the proposed Gold Point SEZ that could be used to supply water needs. Water demands during normal operations would most likely be met by withdrawing groundwater from wells constructed on-site, and given the subsurface connection between regional groundwater and basins outside the SEZ (see Section 11.6.9.1.2), there is the potential that groundwater withdrawals could reduce surface water levels in streams and wetlands outside of the proposed SEZ. Additional details on the

volume of water required and the types of organisms present in potentially affected water bodies would be required in order to further evaluate the potential for impacts from water withdrawals.

As described in Section 5.10.3, water quality in aquatic habitats could be affected by the introduction of contaminants such as fuels, lubricants, or pesticides/herbicides during site characterization, construction, operation, or decommissioning/reclamation of a solar energy facility. Construction activities occurring near intermittent streams in the Gold Point SEZ and in the proposed new transmission line corridor could introduce contaminants into intermittent streams. However, these features are not expected to contain aquatic habitat or biota and do not connect to any perennial surface waters. The introduction of contaminants could be further minimized by avoiding construction near streams.

11.6.11.4.3 SEZ-Specific Design Features and Design Feature Effectiveness

No SEZ-specific design features are identified at this time. If programmatic design features described in Appendix A, Section A.2.2, are implemented as needed and if the utilization of water from groundwater or surface water sources is adequately controlled to maintain sufficient water levels in aquatic habitats, the potential impacts on aquatic biota and habitats from solar energy development at the proposed Gold Point SEZ would be negligible.

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11.6.12 Special Status Species (Threatened, Endangered, Sensitive, and Rare Species)

This section addresses special status species that are known to occur, or for which suitable habitat occurs, on or within the potentially affected area of the proposed Gold Point SEZ. Special status species include the following types of species[3]:

- Species listed as threatened or endangered under the ESA;
- Species that are proposed for listing, are under review, or are candidates for listing under the ESA;
- Species that are listed by the BLM as sensitive;
- Species that are listed by the State of Nevada4; and
- Species that have been ranked by the State of Nevada as S1 or S2 or species of concern by the State of Nevada or the USFWS; hereafter referred to as "rare" species.

Special status species known to occur within 50 mi (80 km) of the Gold Point SEZ center (i.e., the SEZ region) were determined from natural heritage records available through NatureServe Explorer (NatureServe 2010), information provided by the NDOW NNHP (Miskow 2009; NDCNR 2004, 2009a,b), CNDDB (CDFG 2010), the SWReGAP (USGS 2004, 2005a, 2007), the CAReGAP (Davis et al. 1998; USGS 2010e), and the USFWS ECOS (USFWS 2010). Information reviewed consisted of county-level occurrences as determined from Nature Serve, element occurrences provided by the CDFG and NNHP, as well as modeled land cover types and predicted suitable habitats for the species within the 50 mi (80 km) region as determined from CAReGAP and SWReGAP. The 50-mi (80-km) SEZ region intersects Esmeralda and Nye Counties, Nevada, as well as Inyo and Mono Counties, California. However, the SEZ and affected area occurs only in Esmeralda County, Nevada. See Appendix M for additional information on the approach used to identify species that could be affected by development within the SEZ.

11.6.12.1 Affected Environment

The affected area considered in the assessment included the areas of direct and indirect effects. The area of direct effects was defined as the area that would be physically modified during project development (i.e., where ground-disturbing activities would occur). For the Gold Point SEZ, the area of direct effects included the SEZ and the areas within the transmission

[3] See Section 4.6.4 for definitions of these species categories. Note that some of the categories of species included here do not fit BLM's definition of special status species as defined in BLM Manual 6840 (BLM 2008b). These species are included here to ensure broad consideration of species that may be most vulnerable to impacts.

[4] State-listed species for the state of Nevada are those protected under NRS 501.110 (animals) or NRS **527 (plants).**

corridor where ground-disturbing activities are assumed to occur. No new access roads are expected to be needed to serve development on the SEZ because of the proximity of existing infrastructure (refer to Section 11.6.1.2 for development assumptions). The area of indirect effects was defined as the area within 5 mi (8 km) of the SEZ boundary and the portion of the transmission corridor where ground-disturbing activities would not occur but that could be indirectly affected by activities in the area of direct effects. Indirect effects considered in the assessment included effects from surface runoff, dust, noise, lighting, and accidental spills from the SEZ and transmission construction area, but did not include ground-disturbing activities. The potential magnitude of indirect effects would decrease with increasing distance from the SEZ. This area of indirect effects was identified on the basis of professional judgment and was considered sufficiently large to bound the area that would potentially be subject to indirect effects. The affected area includes both the direct and indirect effects areas.

The primary land cover habitat type within the affected area is intermountain basin mixed desert scrub (see Section 11.6.10). Potentially unique habitats in the affected area in which special status species may reside include rocky cliffs and outcrops, desert washes, playas, and woodland habitats. There are no permanent or perennial surface water features on the SEZ or within the area of indirect effects. However, various intermittent streams (washes) and playas occur on the SEZ and throughout the area of indirect effects. In particular, Jackson Wash occurs northeast of the SEZ within the transmission corridor, and an unnamed tributary to Jackson Wash occurs on the SEZ (Figure 11.6.12.1-1).

All special status species that are known to occur within the Gold Point SEZ region (i.e., within 50 mi [80 km] of the center of the SEZ) are listed, with their status, nearest recorded occurrence, and habitats, in Appendix J. Of these species, 21 could be affected by solar energy development on the SEZ based on recorded occurrences or the presence of potentially suitable habitat in the area. These species, their status, and their habitats are presented in Table 11.6.12.1-1. For many of the species listed in the table, their predicted potential occurrence in the affected area is based only on a general correspondence between mapped SWReGAP land cover types and descriptions of species habitat preferences. This overall approach to identifying species in the affected area probably overestimates the number of species that actually occur in the affected area. For many of the species identified as having potentially suitable habitat in the affected area, the nearest known occurrence is more than 20 mi (32 m) away from the SEZ.

Based on NNHP records, there are no special status species known to occur within the affected area of the Gold Point SEZ (Table 11.6.12.1-1). There are no groundwater-dependent species in the vicinity of the SEZ based upon NNHP records, comments provided by the USFWS (Stout 2009), and the evaluation of groundwater resources in the Gold Point SEZ region (Section 11.6.9).

11.6.12.1.1 Species Listed under the Endangered Species Act That Could Occur in the Affected Area

In scoping comments on the proposed Gold Point SEZ (Stout 2009), the USFWS did not express concern for impacts of project development within the SEZ on any species listed as

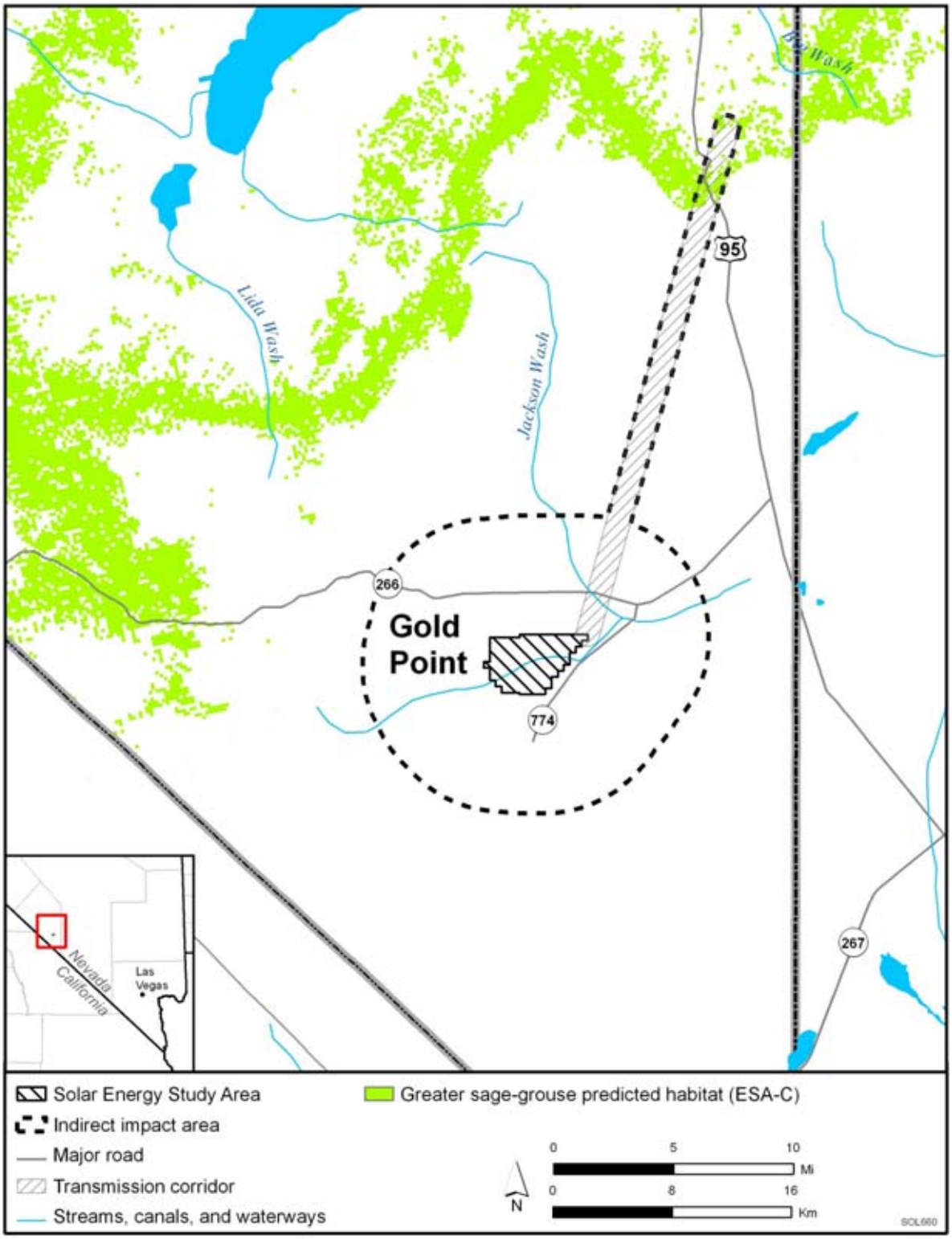

FIGURE 11.6.12.1-1 Known or Potential Occurrences of Species Listed as Endangered or Threatened under the ESA, Candidates for Listing under the ESA, or Species under Review for ESA Listing in the Affected Area of the Proposed Gold Point SEZ (Sources: Miskow 2009; USGS 2007)

TABLE 11.6.12.1-1 Habitats, Potential Impacts, and Potential Mitigation for Special Status Species That Could Be Affected by Solar Energy Development on the Proposed Gold Point SEZ

Common Name	Scientific Name	Listing Status[a]	Habitat[b]	Maximum Area of Potential Habitat Affected[c]: Within SEZ (Direct Effects)[d]	Maximum Area of Potential Habitat Affected[c]: Transmission Line (Direct Effects)[e]	Maximum Area of Potential Habitat Affected[c]: Indirect Effects (Outside SEZ)[f]	Overall Impact Magnitude[g] and Species-Specific Mitigation[h]
Plants							
Bullfrog Hills sweetpea	*Lathyrus hitchcockianus*	NV-S2	Open, dry to slightly moist gravels of rocky drainage bottoms in canyons and on upper alluvial slopes, often at bases of boulders or canyon walls and climbing up through shrubs, in areas of volcanic tuff or carbonate rocks in the mixed-shrub, sagebrush, and pinyon-juniper zones. Elevation ranges between 4,000 and 7,000 ft.[i] Nearest recorded occurrence is 35 mi[j] southeast of the SEZ. About 512,600 acres[k] of potentially suitable habitat occurs in the SEZ region.	3,850 acres of potentially suitable habitat lost (0.1% of available potentially suitable habitat)	30 acres of potentially suitable habitat lost (<0.1% of available potentially suitable habitat)	90,300 acres of potentially suitable habitat (2.9% of available potentially suitable habitat)	Small overall impact. Pre-disturbance surveys and avoidance or minimization of disturbance to occupied habitats in the area of direct effects; translocation of individuals from area of direct effects; or compensatory mitigation of direct effects on occupied habitats could reduce impacts. Note that these same potential mitigations apply to all special status plants.
Clokey paintbrush	*Castilleja martinii* var. *clokeyi*	FWS-SC	Pinyon-juniper woodland at elevations between 6,500 and 9,500 ft. Nearest recorded occurrence is 15 mi east of the SEZ. About 513,700 acres of potentially suitable habitat occurs in the SEZ region.	0 acres	0 acres	80 acres of potentially suitable habitat (<0.1% of available potentially suitable habitat)	Small overall impact; no direct effects. No species-specific mitigation is warranted.

TABLE 11.6.12.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[a]	Habitat[b]	Maximum Area of Potential Habitat Affected[c]: Within SEZ (Direct Effects)[d]	Maximum Area of Potential Habitat Affected[c]: Transmission Line (Direct Effects)[e]	Maximum Area of Potential Habitat Affected[c]: Indirect Effects (Outside SEZ)[f]	Overall Impact Magnitude[g] and Species-Specific Mitigation[h]
Plants (Cont.)							
Eastwood milkweed	*Asclepias eastwoodiana*	BLM-S; FWS-SC; NV-S2	Endemic to Nevada in Esmeralda, Lander, Lincoln, and Nye Counties in open areas on a wide variety of basic (pH usually >8) soils, including calcareous clay knolls, sand, carbonate or basaltic gravels, or shale outcrops, generally barren and lacking competition. Frequently occurs in small washes or other moisture-accumulating microsites at elevations between 4,700 and 7,100 ft. Nearest recorded occurrence is 30 mi northeast of the SEZ. About 37,900 acres of potentially suitable habitat occurs in the SEZ region.	An unquantified amount of potentially suitable desert wash habitat occurs on the SEZ.[l]	An unquantified amount of potentially suitable desert wash habitat occurs in the transmission corridor.[l]	420 acres of potentially suitable habitat (1.1% of available potentially suitable habitat)	Small to large overall impact. Avoiding or minimizing disturbance to desert wash habitats in the area of direct effects could reduce impacts. The amount of potentially suitable desert wash habitat in the area of direct effects is not quantified. See the Bullfrog Hills sweetpea for a list of other potential mitigation measures.
Holmgren lupine	*Lupinus holmgrenianus*	BLM-S; NV-S2	Inhabits dry desert slopes, washes, and valleys on volcanic substrates, in association with sagebrush and pinyon-juniper woodland. Elevation ranges between 4,600 and 8,200 ft. Nearest recorded occurrence is 9 mi west of the SEZ. About 119,700 acres of potentially suitable habitat occurs in the SEZ region.	0 acres	10 acres of potentially suitable habitat lost (<0.1% of available potentially suitable habitat)	27,300 acres of potentially suitable habitat (1.8% of available potentially suitable habitat)	Small overall impact. Avoiding or minimizing disturbance to sagebrush habitats in the area of direct effects could reduce impacts. See the Bullfrog Hills sweetpea for a list of other potential mitigations.

TABLE 11.6.12.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[a]	Habitat[b]	Maximum Area of Potential Habitat Affected[c]			Overall Impact Magnitude[g] and Species-Specific Mitigation[h]
				Within SEZ (Direct Effects)[d]	Transmission Line (Direct Effects)[e]	Indirect Effects (Outside SEZ)[f]	
Plants (Cont.)							
Panamint Mountains bedstraw	*Galium hilendiae* ssp. *carneum*	NV-S1	Rocky or gravelly substrates of rocky slopes or open flats within Mojave desert scrub and pinyon-juniper woodlands at elevations between 4,000 and 11,200 ft. Nearest recorded occurrence is 30 mi southeast of the SEZ. About 962,400 acres of potentially suitable habitat occurs in the SEZ region.	0 acres	0 acres	160 acres of potentially suitable habitat (<0.1% of available potentially suitable habitat)	Small overall impact; no direct effects. No species-specific mitigation is warranted.
Squalid milkvetch	*Astragalus serenoi* var. *sordescens*	NV-S2	Endemic to Nevada on dry, open, gravelly, or sandy soils along gentle slopes of alluvial fans or light-colored clay hills, within mixed-shrub, sagebrush, and lower pinyon-juniper communities at elevations between 5,000 and 6,800 ft. Nearest recorded occurrence is 35 mi north of the SEZ. About 2,815,250 acres of potentially suitable habitat occurs in the SEZ region.	3,850 acres of potentially suitable habitat lost (0.1% of available potentially suitable habitat)	30 acres of potentially suitable habitat lost (<0.1% of available potentially suitable habitat)	90,000 acres of potentially suitable habitat (3.2% of available potentially suitable habitat)	Small overall impact. See the Bullfrog Hills sweetpea for a list of potential mitigations.

TABLE 11.6.12.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[a]	Habitat[b]	Maximum Area of Potential Habitat Affected[c]			Overall Impact Magnitude[g] and Species-Specific Mitigation[h]
				Within SEZ (Direct Effects)[d]	Transmission Line (Direct Effects)[e]	Indirect Effects (Outside SEZ)[f]	
Plants (Cont.)							
Tonopah pincushion cactus	*Sclerocactus nyensis*	BLM-S; NV-P; NV-S1	Endemic to Esmeralda and Nye Counties, Nevada on dry rocky soils and low outcrops of rhyolite, tuff, and possibly other rock types, on gentle slopes in open areas or under shrubs in the upper salt desert and lower sagebrush zones. Elevation ranges between 5,700 and 5,800 ft. Known to occur in Esmeralda County, Nevada. About 2,370,300 acres of potentially suitable habitat occurs in the SEZ region.	3,850 acres of potentially suitable habitat lost (0.2% of available potentially suitable habitat)	30 acres of potentially suitable habitat lost (<0.1% of available potentially suitable habitat)	88,600 acres of potentially suitable habitat (3.7% of available potentially suitable habitat)	Small overall impact. See the Bullfrog Hills sweetpea for a list of potential mitigations.
Weasel phacelia	*Phacelia mustelina*	NV-S2	Mojave desert scrub and pinyon-juniper woodlands on volcanic or gravelly substrates at elevations between 5,000 and 5,500 ft. Nearest recorded occurrence is 35 mi southeast of the SEZ. About 1,462,700 acres of potentially suitable habitat occurs in the SEZ region.	0 acres	0 acres	1,450 acres of potentially suitable habitat (0.1% of available potentially suitable habitat)	Small overall impact; no direct effect. No species-specific mitigation is warranted.

TABLE 11.6.12.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[a]	Habitat[b]	Maximum Area of Potential Habitat Affected[c]: Within SEZ (Direct Effects)[d]	Maximum Area of Potential Habitat Affected[c]: Transmission Line (Direct Effects)[e]	Maximum Area of Potential Habitat Affected[c]: Indirect Effects (Outside SEZ)[f]	Overall Impact Magnitude[g] and Species-Specific Mitigation[h]
Birds							
Ferruginous hawk	*Buteo regalis*	BLM-S; FWS-SC	Winter resident in project area in grasslands, sagebrush and saltbrush habitats, as well as the periphery of pinyon-juniper woodlands throughout the project area. Known to occur in Esmeralda County, Nevada. About 790,000 acres of potentially suitable habitat occurs in the SEZ region.	200 acres of potentially suitable foraging habitat lost (<0.1% of available potentially suitable habitat)	225 acres of potentially suitable foraging habitat lost (<0.1% of available potentially suitable habitat)	28,100 acres of potentially suitable foraging habitat (3.6% of available potentially suitable habitat)	Small overall impact on foraging habitat only. Avoidance of direct impacts on foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects.
Greater sage-grouse	*Centrocercus urophasianus*	ESA-C; BLM-S;	Year-round resident in SEZ region. Plains, foothills, and mountain valleys dominated by sagebrush. Lek sites are located in relatively open areas surrounded by sagebrush or in areas where sagebrush density is low. Nesting usually occurs on the ground where sagebrush density is higher. Some populations may travel up to 60 mi between summer and winter habitats. Known to occur in Esmeralda County, Nevada. About 312,800 acres of potentially suitable habitat occurs in the SEZ region.	0 acres	50 acres of potentially suitable habitat lost (<0.1% of available potentially suitable habitat)	900 acres of potentially suitable foraging habitat (0.3% of available potentially suitable habitat)	Small overall impact. Pre-disturbance surveys and avoidance or minimization of disturbance to occupied habitats and/or suitable leks and nesting sites in the area of direct effects or compensatory mitigation of direct effects on occupied habitats could reduce impacts. The potential for impact and need for mitigation should be determined in coordination with the USFWS and NDOW.

TABLE 11.6.12.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[a]	Habitat[b]	Maximum Area of Potential Habitat Affected[c]: Within SEZ (Direct Effects)[d]	Maximum Area of Potential Habitat Affected[c]: Transmission Line (Direct Effects)[e]	Maximum Area of Potential Habitat Affected[c]: Indirect Effects (Outside SEZ)[f]	Overall Impact Magnitude[g] and Species-Specific Mitigation[h]
Birds (Cont.)							
Prairie falcon	*Falco mexicanus*	BLM-S	Year-round resident in the project area, primarily in open habitats in mountainous areas, steppe, grasslands, or cultivated areas. Nests in well-sheltered ledges of rocky cliffs and outcrops. Known to occur in Esmeralda County, Nevada. About 2,387,300 acres of potentially suitable habitat occurs in the SEZ region.	4,500 acres of potentially suitable foraging habitat lost (0.2% of available potentially suitable habitat)	500 acres of potentially suitable foraging habitat lost (<0.1% of available potentially suitable habitat)	81,350 acres of potentially suitable habitat (3.4% of available potentially suitable habitat)	Small overall impact. No direct effects on nesting habitat. Avoidance of direct impacts on foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects.
Swainson's hawk	*Buteo swainsoni*	BLM-S; NV-P; CA-S2; NV-S2	Summer breeding resident in the SEZ region. Savanna, open pine-oak woodlands, grasslands, and cultivated lands. Nests typically in solitary trees, bushes, or small groves; sometimes nests near urban areas. Known to occur in Esmeralda County, Nevada. About 735,600 acres of potentially suitable habitat occurs in the SEZ region.	0 acres	50 acres of potentially suitable foraging habitat lost (<0.1% of available potentially suitable habitat)	9,650 acres of potentially suitable habitat (1.3% of available potentially suitable habitat)	Small overall impact. No direct impact on nesting habitat. Avoidance of direct impacts on foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects.

TABLE 11.6.12.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[a]	Habitat[b]	Maximum Area of Potential Habitat Affected[c]: Within SEZ (Direct Effects)[d]	Maximum Area of Potential Habitat Affected[c]: Transmission Line (Direct Effects)[e]	Maximum Area of Potential Habitat Affected[c]: Indirect Effects (Outside SEZ)[f]	Overall Impact Magnitude[g] and Species-Specific Mitigation[h]
Western burrowing owl	*Athene cunicularia hypugaea*	BLM-S; FWS-SC	Year-round resident in open grasslands and prairies, as well as disturbed sites such as golf courses, cemeteries, and airports throughout the SEZ region. Nests in burrows constructed by mammals (prairie dog, badger, etc.). Known to occur in Esmeralda County, Nevada. About 3,082,700 acres of potentially suitable habitat occurs in the SEZ region.	4,625 acres of potentially suitable habitat lost (0.2% of available potentially suitable habitat)	650 acres of potentially suitable habitat lost (<0.1% of available potentially suitable habitat)	97,000 acres of potentially suitable habitat (3.1% of available potentially suitable habitat)	Small overall impact on foraging and nesting habitat. Pre-disturbance surveys; avoidance or minimization of disturbance to occupied burrows and habitats in the area of direct effects; or compensatory mitigation of direct effects on occupied habitats could reduce impacts.
Mammals							
Brazilian free-tailed bat	*Tadarida brasiliensis*	BLM-S; NV-P	Year-round resident in SEZ region. Forages in desert grassland, old fields, savanna, shrubland, and woodland habitats as well as urban areas. Roosts in old buildings, caves, mines, and hollow trees. Nearest recorded occurrence is 15 mi west of the SEZ. About 2,651,850 acres of potentially suitable habitat occurs in the SEZ region.	4,800 acres of potentially suitable foraging habitat lost (0.2% of available potentially suitable habitat)	590 acres of potentially suitable foraging habitat lost (<0.1% of available potentially suitable habitat)	83,500 acres of potentially suitable habitat (3.1% of available potentially suitable habitat)	Small overall impact; direct impact on foraging habitat only. Avoidance of direct impacts on foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects.

TABLE 11.6.12.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[a]	Habitat[b]	Maximum Area of Potential Habitat Affected[c]			Overall Impact Magnitude[g] and Species-Specific Mitigation[h]
				Within SEZ (Direct Effects)[d]	Transmission Line (Direct Effects)[e]	Indirect Effects (Outside SEZ)[f]	
Mammals (Cont.)							
Fringed myotis	*Myotis thysanodes*	BLM-S; NV-P; FWS-SC; NV-S2	Year-round resident in SEZ region. Wide range of habitats including lowland riparian, desert shrub, pinyon-juniper, and sagebrush habitats. Roost in buildings and caves. Known to occur in Esmeralda County, Nevada. About 3,051,200 acres of potentially suitable habitat occurs in the SEZ region.	4,700 acres of potentially suitable foraging habitat lost (0.2% of available potentially suitable habitat)	620 acres of potentially suitable foraging habitat lost (<0.1% of available potentially suitable habitat)	88,200 acres of potentially suitable habitat (2.9% of available potentially suitable habitat)	Small overall impact; direct impact on foraging habitat only. Avoidance of direct impacts on foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects.
Nelson's bighorn sheep	*Ovis canadensis nelsoni*	BLM-S; FWS-SC	Open, steep rocky terrain in mountainous habitats of the eastern Mojave and Sonoran Deserts in California. Rarely uses desert lowlands, but may use them as corridors for travel between mountain ranges. Known to occur in Esmeralda County, Nevada. About 941,500 acres of potentially suitable habitat occurs in the SEZ region.	0 acres	150 acres of potentially suitable foraging habitat lost (<0.1% of available potentially suitable habitat)	24,100 acres of potentially suitable habitat (2.6% of available potentially	Small overall impact. Impacts could be reduced by conducting pre-disturbance surveys and avoiding occupied habitats and important movement corridors in the area of direct effects.

TABLE 11.6.12.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[a]	Habitat[b]	Maximum Area of Potential Habitat Affected[c]			Overall Impact Magnitude[g] and Species-Specific Mitigation[h]
				Within SEZ (Direct Effects)[d]	Transmission Line (Direct Effects)[e]	Indirect Effects (Outside SEZ)[f]	
Mammals (Cont.)							
Pale kangaroo mouse	*Microdipodops pallidus*	NV-P; NV-S2	Known from southwestern Nevada and southeastern California. Inhabits fine sands in alkali sink and desert scrub dominated by shadscale or big sagebrush. Often burrows in areas of soft, windblown sand piled at the bases of shrubs. Known to occur in Esmeralda County, Nevada. About 1,251,250 acres of potentially suitable habitat occurs in the SEZ region.	4,700 acres of potentially suitable foraging habitat lost (0.4% of available potentially suitable habitat)	200 acres of potentially suitable foraging habitat lost (<0.1% of available potentially suitable habitat)	50,500 acres of potentially suitable habitat (4.0% of available potentially suitable habitat)	Small overall impact. Pre-disturbance surveys; avoidance or minimization of disturbance to occupied habitats on the SEZ; or compensatory mitigation of direct effects on occupied habitats could reduce impacts.
Pallid bat	*Antrozous pallidus*	BLM-S; NV-P; FWS-SC	Year-round resident in SEZ region. Low-elevation desert communities, including grasslands, shrublands, and woodlands. Roosts in caves, crevices, and mines. Nearest recorded occurrence is 15 mi west of the SEZ. About 2,616,400 acres of potentially suitable habitat occurs in the SEZ region.	4,550 acres of potentially suitable foraging habitat lost (0.2% of available potentially suitable habitat)	575 acres of potentially suitable foraging habitat lost (<0.1% of available potentially suitable habitat)	83,175 acres of potentially suitable habitat (3.2% of available potentially suitable habitat)	Small overall impact; direct impact on foraging habitat only. Avoidance of direct impacts on foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects.

TABLE 11.6.12.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[a]	Habitat[b]	Maximum Area of Potential Habitat Affected[c]			Overall Impact Magnitude[g] and Species-Specific Mitigation[h]
				Within SEZ (Direct Effects)[d]	Transmission Line (Direct Effects)[e]	Indirect Effects (Outside SEZ)[f]	
Mammals (Cont.)							
Silver-haired bat	*Lasionycteris noctivagans*	BLM-S; FWS-SC	Year-round resident in SEZ region. Primarily high-elevation (1,600 to 8,500 ft) forested areas comprising aspen, cottonwood, white fir, pinyon-juniper, subalpine fir, willow, and spruce communities. Roost and nursery sites occur in tree foliage, cavities, or under loose bark. Rarely hibernates in caves. Nearest recorded occurrence is 15 mi west of the SEZ. About 2,609,400 acres of potentially suitable habitat occurs in the SEZ region.	4,600 acres of potentially suitable foraging habitat lost (0.2% of available potentially suitable habitat)	580 acres of potentially suitable foraging habitat lost (<0.1% of available potentially suitable habitat)	83,200 acres of potentially suitable habitat (3.2% of available potentially suitable habitat)	Small overall impact; direct impact on foraging habitat only. Avoidance of direct impacts on foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects.
Spotted bat	*Euderma maculatum*	BLM-S; NV-P; FWS-SC; NV-S2	Year-round resident in SEZ region. Year-round resident in SEZ region near forests and shrubland habitats throughout the SEZ region. Uses caves and rock crevices for day roosting and winter hibernation. Nearest recorded occurrence is 15 mi west of the SEZ. About 2,605,300 acres of potentially suitable habitat occurs in the SEZ region.	4,700 acres of potentially suitable foraging habitat lost (0.2% of available potentially suitable habitat)	550 acres of potentially suitable foraging habitat lost (<0.1% of available potentially suitable habitat)	76,750 acres of potentially suitable habitat (2.9% of available potentially suitable habitat)	Small overall impact; direct impact on foraging habitat only. Avoidance of direct impacts on foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects.

TABLE 11.6.12.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[a]	Habitat[b]	Maximum Area of Potential Habitat Affected[c]			Overall Impact Magnitude[g] and Species-Specific Mitigation[h]
				Within SEZ (Direct Effects)[d]	Transmission Line (Direct Effects)[e]	Indirect Effects (Outside SEZ)[f]	
Mammals (Cont.)							
Townsend's big-eared bat	*Corynorhinus townsendii*	BLM-S; NV-P; NV-S2	Year-round resident in SEZ region near forests and shrubland habitats below 9,000 ft elevation throughout the SEZ region. Roosts and hibernates in caves, mines, and buildings. Nearest recorded occurrence is 8 mi west of the SEZ. About 2,347,800 acres of potentially suitable habitat occurs in the SEZ region.	4,600 acres of potentially suitable foraging habitat lost (0.2% of available potentially suitable habitat)	450 acres of potentially suitable foraging habitat lost (<0.1% of available potentially suitable habitat)	68,550 acres of potentially suitable habitat (2.9% of available potentially suitable habitat)	Small overall impact; direct impact on foraging habitat only. Avoidance of direct impacts on foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects.
Western small-footed myotis	*Myotis ciliolabrum*	BLM-S; FWS-SC	Year-round resident in SEZ region in a variety of woodlands and riparian habitats at elevations below 9,000 ft. Roosts in caves, buildings, mines, and crevices of cliff faces. Nearest recorded occurrence is 9 mi south of the SEZ. About 3,374,000 acres of potentially suitable habitat occurs in the SEZ region.	4,800 acres of potentially suitable foraging habitat lost (0.2% of available potentially suitable habitat)	650 acres of potentially suitable foraging habitat lost (<0.1% of available potentially suitable habitat)	97,950 acres of potentially suitable habitat (2.9% of available potentially suitable habitat)	Small overall impact; direct impact on foraging habitat only. Avoidance of direct impacts on foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects.

[a] BLM-S = listed as a sensitive species by the BLM; ESA-C = candidate for listing under the ESA; FWS-SC = USFWS species of concern; NV-P = protected in the State of Nevada under NRS 501.110 (animals) or NRS 527 (plants); NV-S1 = ranked as S1 in the State of Nevada; NV-S2 = ranked as S2 in the State of Nevada.

[b] For plant species, potentially suitable habitat was determined by using SWReGAP land cover types. For terrestrial vertebrate species, potentially suitable habitat was determined by using SWReGAP habitat suitability and land cover models. Area of potentially suitable habitat for each species is presented for the SEZ region, which is defined as the area within 50 mi (80 km) of the SEZ center.

Footnotes continued on next page.

TABLE 11.6.12.1-1 (Cont.)

[c] 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 and land cover models. This approach probably overestimates the amount of suitable habitat in the project area. Impacts of access road construction, upgrade, or operation are not assessed in this evaluation due to the proximity of existing infrastructure to the SEZ.

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

[e] For transmission line development, direct effects were estimated within a 22-mi (8-km), 250-ft (76-m) wide ROW from the SEZ to the nearest transmission line. Direct impacts within this area were determined from the proportion of potentially suitable habitat within the 1-mi (1.6-km) wide transmission corridor.

[f] Area of indirect effects was assumed to be the area adjacent to the SEZ within 5 mi (8 km) of the SEZ boundary and the portion of the transmission corridor where ground-disturbing activities would not occur. Indirect effects include effects from surface runoff, dust, noise, lighting, and so on from projects. 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, 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. Programmatic 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 mi to km, multiply by 1.609.

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

[l] Although the SWReGAP did not map any wash habitat on the SEZ, there appear to be numerous desert washes that could provide habitat for this species on the SEZ, in the transmission corridor, and in the area of indirect effects, including Jackson Wash and its tributaries. The area of these washes has not been quantified.

threatened or endangered under the ESA. There are no NNHP records or potentially suitable habitats for any ESA-listed species within the affected area. According to SWReGAP and USGS habitat suitability models, potentially suitable habitat for the desert tortoise, a species listed as threatened under the ESA, does not occur within the affected area of the Gold Point SEZ.

11.6.12.1.2 Species That Are Candidates for Listing under the ESA

In scoping comments on the proposed Gold Point SEZ, the USFWS did not identify any candidate species for listing under the ESA that may be directly or indirectly affected by solar energy development on the SEZ (Stout 2009). However, one candidate species, the greater sage-grouse, may occur within the affected area. This species primarily inhabits sagebrush habitats in plains, foothills, and mountain valley regions. This species is known to occur in Esmeralda County, Nevada, and potentially suitable year-round sagebrush habitat is expected to occur within the affected area (Figure 11.6.12.1-1). According to the SWReGAP habitat suitability model, suitable habitat for this species is not expected to occur on the SEZ. However, approximately 50 acres (0.2 km^2) of potentially suitable habitat for this species is estimated to occur in the assumed transmission ROW; approximately 900 acres (4 km^2) of potentially suitable habitat occurs in the area of indirect effects (Table 11.6.12.1-1). Additional basic information on life history, habitat needs, and threats to populations of the greater sage-grouse is provided in Appendix J.

11.6.12.1.3 Species That Are under Review for Listing under the ESA

On the basis of information provided by the NNHP and the USFWS (Stout 2009) and on availability of potentially suitable habitats, there are no species under review for ESA listing that may occur in the affected area of the Gold Point SEZ.

11.6.12.1.4 BLM-Designated Sensitive Species

There are 16 BLM-designated sensitive species that may occur in the affected area of the Gold Point SEZ or that may be affected by solar energy development on the SEZ (Table 11.6.12.1-1). These BLM-designated sensitive species include the following: (1) plants: Eastwood milkweed, Holmgren lupine, and Tonopah pincushion cactus; (2) birds: ferruginous hawk, greater sage-grouse, prairie falcon, Swainson's hawk, and western burrowing owl; and (3) mammals: Brazilian free-tailed bat, fringed myotis, Nelson's bighorn sheep, pallid bat, silver-haired bat, spotted bat, Townsend's big-eared bat, and western small-footed myotis. Habitats in which BLM-designated sensitive species are found, the amount of potentially suitable habitat in the affected area, and known locations of the species relative to the SEZ are presented in Table 11.6.12.1-1. The greater sage-grouse has been discussed previously because of its candidate status under the ESA (Section 11.6.12.1.2). The remaining 15 species as related to the SEZ are described in the remainder of this section. Additional life history information for these species is provided in Appendix J.

Eastwood Milkweed

The Eastwood milkweed is a perennial herb endemic to Nevada on public and private lands in Esmeralda, Lander, Lincoln, and Nye Counties. It occurs in open areas on a wide variety of basic (pH usually >8) soils, including calcareous clay knolls, sand, carbonate, or basaltic gravels, washes, or shale outcrops at elevations between 4,700 and 7,100 ft (1,430 and 2,150 m). According to the SWReGAP land cover model, potentially suitable rocky cliffs and wash habitats do not occur on the SEZ or in the transmission corridor; however, these suitable habitats may occur within the area of indirect effects (Table 11.6.12.1-1). Although the SWReGAP did not map any wash habitat on the SEZ or transmission corridor, there appear to be numerous washes that could provide habitat for this species in the area of direct effects, including Jackson Wash and its tributaries. The area of these washes has not been quantified.

Holmgren Lupine

The Holmgren lupine is a perennial herb known from southeastern California and southwestern Nevada. It inhabits dry desert slopes, washes, and valleys on volcanic substrates in sagebrush communities and pinyon-juniper woodlands. The species occurs at elevations between 4,600 and 8,200 ft (1,400 and 2,500 m). The nearest known occurrences are approximately 9 mi (14 km) west of the Gold Point SEZ. According to the SWReGAP land cover model, potentially suitable sagebrush and pinyon-juniper woodland habitats may occur within the transmission corridor and in the area of indirect effects. On the basis of an evaluation of SWReGAP land cover types, potentially suitable habitat for this species does not occur on the SEZ.

Tonopah Pincushion Cactus

The Tonopah pincushion cactus is endemic to Esmeralda and Nye Counties, Nevada. This species occurs on dry rocky soils and low outcrops on gentle slopes in open areas or under shrubs in the upper salt desert and lower sagebrush zones. This species is not known to occur in the affected area of the Gold Point SEZ; however, potentially suitable alkaline playa habitat may occur on the SEZ and within the area of indirect effects (Table 11.6.12.1-1).

Ferruginous Hawk

The ferruginous hawk occurs throughout the western United States. According to the SWReGAP habitat suitability model, only potentially suitable winter habitat for the ferruginous hawk is predicted to occur within the affected area of the Gold Point SEZ, although potentially suitable year-round habitat is expected to occur outside of the affected area within the SEZ region. The species inhabits open grasslands, sagebrush flats, desert scrub, and the edges of pinyon-juniper woodlands. This species occurs in Esmeralda County, Nevada, and potentially suitable foraging habitat occurs on the SEZ and in other portions of the affected area (Table 11.6.12.1-1).

Prairie Falcon

The prairie falcon occurs throughout the western United States. According to the SWReGAP habitat suitability model, potentially suitable year-round habitat for the prairie falcon may occur within the affected area of the Gold Point SEZ. The species occurs in open habitats in mountainous areas, sagebrush-steppe, grasslands, or cultivated areas. Nests are typically constructed in well-sheltered ledges of rocky cliffs and outcrops. This species occurs in Esmeralda County, Nevada, and potentially suitable foraging habitat occurs on the SEZ and in other portions of the affected area (Table 11.6.12.1-1). On the basis of an evaluation of SWReGAP land cover types, there is no suitable nesting habitat within the area of direct effects, but approximately 350 acres (1.5 km^2) of cliff and rock outcrop habitat that may be potentially suitable nesting habitat occurs in the area of indirect effects.

Swainson's Hawk

The Swainson's hawk occurs throughout the southwestern United States. According to the SWReGAP habitat suitability model for the Swainson's hawk, only summer breeding habitat occurs in the Gold Point SEZ region. This species inhabits desert, savanna, open pine-oak woodland, grassland, and cultivated habitats. Nests are typically constructed in solitary trees, bushes, or small groves. This species occurs in Esmeralda County, Nevada. According to the SWReGAP habitat suitability model, suitable habitat for this species does not occur on the SEZ; however, potentially suitable foraging habitat occurs in the transmission corridor and in portions of the area of indirect effects (Table 11.6.12.1-1). On the basis of an evaluation of SWReGAP land cover types, there is no suitable nesting habitat within the area of direct effects, but approximately 80 acres (0.3 km^2) of pinyon-juniper woodland habitat that may be potentially suitable nesting habitat occurs in the area of indirect effects.

Western Burrowing Owl

According to the SWReGAP habitat suitability model for the western burrowing owl, the species is a summer breeding resident of open, dry grasslands and desert habitats in the Gold Point SEZ region. The species occurs locally in open areas with sparse vegetation, where it forages in grasslands, shrublands, open disturbed areas, and nests in burrows typically constructed by mammals. The species occurs in Esmeralda County, Nevada, and potentially suitable summer breeding habitat may occur in the SEZ, the transmission corridor, and portions of the area of indirect effects (Table 11.6.12.1-1). The availability of nest sites (burrows) within the affected area has not been determined, but shrubland habitat that may be suitable for either foraging or nesting occurs throughout the affected area.

Brazilian Free-Tailed Bat

The Brazilian free-tailed bat is known from isolated locations throughout the southwestern United States and is considered to be a year-round resident in the Gold Point SEZ

region. The species roosts in buildings, caves, mines, and hollow trees. Foraging occurs in desert grasslands, old fields, savannas, shrublands, woodlands, and urban areas. This species occurs approximately 15 mi (24 km) west of the SEZ. According to the SWReGAP habitat suitability model, potentially suitable foraging habitat may occur on the SEZ, in the transmission corridor, and in portions of the area of indirect effects (Table 11.6.12.1-1). On the basis of an evaluation of SWReGAP land cover types, there is no potentially suitable roosting habitat (rocky cliffs and outcrops) on the SEZ or in the transmission corridor, but approximately 350 acres (1.5 km^2) of potentially suitable roosting habitat occurs in the area of indirect effects.

Fringed Myotis

The fringed myotis is a year-round resident in the Gold Point SEZ region, where it occurs in a variety of habitats including riparian, shrubland, sagebrush, and pinyon-juniper woodlands. Roosting occurs in buildings and caves. This species occurs in Esmeralda County, Nevada. According to the SWReGAP habitat suitability model, potentially suitable foraging habitat may occur on the SEZ, in the transmission corridor, and in portions of the area of indirect effects (Table 11.6.12.1-1). On the basis of an evaluation of SWReGAP land cover types, there is no potentially suitable roosting habitat (rocky cliffs and outcrops) on the SEZ or transmission corridor, but approximately 350 acres (1.5 km^2) of potentially suitable roosting habitat occurs in the area of indirect effects.

Nelson's Bighorn Sheep

The Nelson's bighorn sheep is one of several subspecies of bighorn sheep that occurs in the southwestern United States. This species occurs in desert mountain ranges in Arizona, California, Nevada, Oregon, and Utah. The Nelson's bighorn sheep uses primarily montane shrubland, forest, and grassland habitats, and may utilize desert valleys as corridors for travel between range habitats. According to information provided by the NDOW, the Nelson's bighorn sheep occurs in Esmeralda County, Nevada and potentially suitable habitat may occur in the Silver Peak Range west of the SEZ. According to the SWReGAP habitat suitability model, potentially suitable habitat for this species does not occur on the SEZ; however, potentially suitable habitat may occur in the transmission corridor and in portions of the area of indirect effects. Despite the apparent lack of suitable habitat on the SEZ, this species may utilize portions of the Gold Point SEZ and the transmission corridor as migratory habitat between range habitats (Table 11.6.12.1-1).

Pallid Bat

The pallid bat is a large pale bat with large ears locally common in desert grasslands and shrublands in the southwestern United States. It roosts in caves, crevices, and mines. The species is a year-round resident throughout southern Nevada. The nearest recorded occurrence is approximately 15 mi (24 km) west of the Gold Point SEZ. According to the SWReGAP habitat suitability model, potentially suitable foraging habitat may occur on the SEZ, in the transmission

corridor, and in portions of the area of indirect effects (Table 11.6.12.1-1). On the basis of an evaluation of SWReGAP land cover types, there is no potentially suitable roosting habitat (rocky cliffs and outcrops) on the SEZ or in the transmission corridor, but approximately 350 acres (1.5 km^2) of potentially suitable roosting habitat occurs in the area of indirect effects.

Silver-Haired Bat

The silver-haired bat is a year-round resident in the Gold Point SEZ region, where it occurs in montane forested habitats such as aspen, pinyon-juniper, and spruce communities. Foraging may occur in desert shrubland habitats. This species roosts in tree foliage, rock outcrops, cavities, or under loose bark. The species is known to occur about 15 mi (24 km) west of the SEZ. According to the SWReGAP habitat suitability model, potentially suitable foraging habitat may occur on the SEZ, in the transmission corridor, and in portions of the area of indirect effects (Table 11.6.12.1-1). On the basis of an evaluation of SWReGAP land cover types, there is no potentially suitable roosting habitat (woodlands) on the SEZ or transmission corridor, but approximately 80 acres (0.3 km^2) of potentially suitable roosting habitat occurs in the area of indirect effects.

Spotted Bat

The spotted bat is a year-round resident in the Gold Point SEZ region, where it occurs in a variety of forested and shrubland habitats. It roosts in caves and rock crevices. The species is known to occur approximately 15 mi (24 km) west of the SEZ. Potentially suitable foraging habitat may occur on the SEZ, in the transmission corridor, and in portions of the area of indirect effects (Table 11.6.12.1-1). On the basis of an evaluation of SWReGAP land-cover types, there is no suitable roosting habitat within the SEZ or transmission corridor, but approximately 350 acres (1.5 km^2) of cliff and rock outcrop habitat that may be potentially suitable roosting habitat occurs in the area of indirect effects.

Townsend's Big-Eared Bat

The Townsend's big-eared bat is widely distributed throughout the western United States. According to the SWReGAP habitat suitability model, the species forages year-round in a wide variety of desert and nondesert habitats in the Gold Point SEZ region. The species roosts in caves, mines, tunnels, buildings, and other man-made structures. Nearest recorded occurrences are approximately 8 mi (13 km) west of the Gold Point SEZ. According to the SWReGAP habitat suitability model, potentially suitable foraging habitat may occur on the SEZ, in the transmission corridor, and in portions of the area of indirect effects (Table 11.6.12.1-1). On the basis of an evaluation of SWReGAP land cover types, there is no suitable roosting habitat within the SEZ or transmission corridor, but approximately 350 acres (1.5 km^2) of cliff and rock outcrop habitat that may be potentially suitable roosting habitat occurs in the area of indirect effects.

Western Small-Footed Myotis

The western small-footed myotis is widely distributed throughout the western United States. According to the SWReGAP habitat suitability model, this species is a year-round resident in southern Nevada, where it occupies a wide variety of desert and nondesert habitats including cliffs and rock outcrops, grasslands, shrubland, and mixed woodlands. The species roosts in caves, mines, tunnels, beneath boulders or loose bark, buildings, and other man-made structures. Nearest recorded occurrences are approximately 9 mi (14 km) south of the Gold Point SEZ. According to the SWReGAP habitat suitability model, potentially suitable foraging habitat may occur on the SEZ, in the transmission corridor, and in portions of the area of indirect effects (Table 11.6.12.1-1). On the basis of an evaluation of SWReGAP land cover types, there is no suitable roosting habitat within the SEZ or transmission corridor, but approximately 350 acres (1.5 km^2) of cliff and rock outcrop habitat that may be potentially suitable roosting habitat occurs in the area of indirect effects.

11.6.12.1.5 State-Listed Species

There are 8 species listed by the State of Nevada that may occur in the Gold Point SEZ affected area or may be affected by solar energy development on the SEZ (Table 11.6.12.1-1). These state-listed species include the following: (1) plants: Tonopah pincushion cactus; (2) bird: Swainson's hawk; and (3) mammals: Brazilian free-tailed bat, fringed myotis, pale kangaroo mouse, pallid bat, spotted bat, and Townsend's big-eared bat. All of these species are protected in the State of Nevada under NRS 501.110 or NRS 527. Of these state-listed species, only the pale kangaroo mouse has not been previously discussed and is described in the remainder of this section. Additional life history information for these species is provided in Appendix J.

The pale kangaroo mouse is a rodent endemic to southwestern Nevada and southeastern California. This species inhabits fine sands in alkali sink and desert scrub habitats dominated by shadscale (*Atriplex confertifolia*) or big sagebrush (*Artemisia tridentata*). The species often burrows in areas of soft windblown sand piled at the bases of shrubs. Although the pale kangaroo mouse is not known to occur in the affected area of the Gold Point SEZ, the species is known to occur in Esmeralda County, Nevada, and potentially suitable habitat may occur on the SEZ, transmission corridor, and throughout portions of the area of indirect effects (Table 11.6.12.1-1).

11.6.12.1.6 Rare Species

There are 19 rare species (i.e., state rank of S1 or S2 in the State of Nevada or a species of concern by the State of Nevada or the USFWS) that may be affected by solar energy development on the Gold Point SEZ (Table 11.6.12.1-1). Of these species, five—all plants—have not been previously discussed: Bullfrog Hills sweetpea, Clokey paintbrush, Panamint Mountains bedstraw, squalid milkvetch, and weasel phacelia. The habitats and known occurrences of these species relative to the SEZ are shown in Table 11.6.12.1-1. Additional life history information for these species is provided in Appendix J.

11.6.12.2 Impacts

The potential for impacts on special status species from utility-scale solar energy development within the proposed Gold Point SEZ is presented in this section. The types of impacts that special status species could incur from construction and operation of utility-scale solar energy facilities are discussed in Section 5.10.4.

The assessment of impacts on special status species is based on available information on the presence of species in the affected area as presented in Section 11.6.12.1, following the analysis approach described in Appendix M. It is assumed that, prior to development, surveys would be conducted to determine the presence of special status species and their habitats in and near areas where ground-disturbing activities would occur. Additional NEPA assessments, ESA consultations, and coordination with state natural resource agencies may be needed to address project-specific impacts more thoroughly. These assessments and consultations could result in additional required actions to avoid, minimize, or mitigate impacts on special status species (see Section 11.6.12.3).

Solar energy development within the Gold Point SEZ could affect a variety of habitats (see Sections 11.6.9 and 11.6.10). Impacts on these habitats could in turn affect special status species that are dependent on those habitats. As discussed in Section 11.6.12.1, this approach to identifying the species that could occur in the affected area probably overestimates the number of species that actually occur in the affected area, and may therefore overestimate impacts on some special status species. Based on NNHP records, there are no special status species known to occur within the affected area of the Gold Point SEZ. There are no groundwater-dependent species within the affected area of the Gold Point SEZ based upon NNHP records, information provided by the USFWS (Stout 2009), and the evaluation of groundwater resources within the SEZ region (Section 11.6.9).

Impacts on special status species could occur during all phases of development (construction, operation, and decommissioning and reclamation) of a utility-scale solar energy project within the SEZ. Construction and operation activities could result in short- or long-term impacts on individuals and their habitats, especially if these activities are sited in areas where special status species are known to or could occur. As presented in Section 11.6.1.2, a 22-mi (35-km) long transmission corridor is assumed to be needed to serve solar facilities within this SEZ. No new access road development is assumed to be needed because of the proximity of State Route 774 adjacent to the eastern boundary of the SEZ.

Direct impacts would result from habitat destruction or modification. It is assumed that direct impacts would occur only within the SEZ and the transmission line ROW where ground-disturbing activities are expected to occur. Indirect impacts could result from surface water and sediment runoff from disturbed areas, fugitive dust generated by project activities, accidental spills, harassment, and lighting. No ground-disturbing activities associated with project development are anticipated to occur within the area of indirect effects. Decommissioning of facilities and reclamation of disturbed areas after operations cease could result in short-term negative impacts on individuals and habitats adjacent to project areas, but long-term benefits

would accrue if original land contours and native plant communities were restored in previously disturbed areas.

The successful implementation of programmatic design features (discussed in Appendix A, Section A.2.2) would reduce direct impacts on some special status species, especially those that depend on habitat types that can be relatively easy to avoid (e.g., washes and playas). Indirect impacts on special status species could be reduced to negligible levels by implementing programmatic design features, especially those engineering controls that would reduce runoff, sedimentation, spills, and fugitive dust.

11.6.12.2.1 Impacts on Species Listed under the ESA

On the basis of information provided by the NNHP and the USFWS (Stout 2009) and on availability of potentially suitable habitats, there are no species listed under the ESA that may be affected by solar energy development on the Gold Point SEZ. According to SWReGAP and USGS habitat suitability models, potentially suitable habitat for the desert tortoise, a species listed as threatened under the ESA, does not occur within the affected area of the Gold Point SEZ.

11.6.12.2.2 Impacts on Species That Are Candidates for Listing under the ESA

The greater sage-grouse is the only ESA candidate species that could occur in the affected area of the Gold Point SEZ, based upon information provided by the NNHP (NDCNR 2004) and the SWReGAP (USGS 2007). This species is known to occur in Esmeralda County, Nevada, and potentially suitable year-round sagebrush habitat is expected to occur in portions of the affected area (Figure 11.6.12.1-1). According to the SWReGAP habitat suitability model, suitable habitat for this species is not expected to occur on the SEZ. However, approximately 50 acres (0.2 km^2) of potentially suitable habitat in the assumed transmission corridor may be directly affected by construction and operations (Table 11.6.12.1-1). This direct effects area represents less than 0.1% of available suitable habitat for the greater sage-grouse in the SEZ region. About 900 acres (4 km^2) of suitable habitat occurs in the area of potential indirect effects; this area represents about 0.3% of the available suitable habitat in the SEZ region (Table 11.6.12.1-1).

The overall impact on the greater sage-grouse from construction, operation, and decommissioning of utility-scale solar energy facilities within the Gold Point 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 SEZ region. The implementation of programmatic design features alone may not be sufficient to reduce impacts to negligible levels, because it may not be possible to avoid all potentially suitable sagebrush habitats in the area of direct effects.

Efforts to mitigate the impacts of solar energy development on the greater sage-grouse should be developed in coordination with the USFWS and the NDOW following the *Strategic*

Plan for Management of Sage Grouse (UDWR 2002) and *Guidelines to Manage Sage Grouse Populations and Their Habitats* (Connelly et al. 2000). Impacts could be reduced by conducting pre-disturbance surveys and avoiding or minimizing disturbance to occupied habitats (especially active leks and suitable nesting areas) in the areas 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. Any mitigation plans should be developed in consultation with the USFWS and the NDOW.

11.6.12.2.3 Impacts on Species That Are under Review for Listing under the ESA

On the basis of information provided by the NNHP and the USFWS (Stout 2009) and on availability of potentially suitable habitats, there are no species under review for ESA listing that may be affected by solar energy facilities on the Gold Point SEZ.

11.6.12.2.4 Impacts on BLM-Designated Sensitive Species

BLM-designated sensitive species that may be affected by solar energy development on the Gold Point SEZ and are not previously discussed as ESA-listed (Section 11.6.12.2.1), candidates for ESA listing (Section 11.6.12.2.2), or under review for ESA listing (Section 11.6.12.2.3) are discussed below.

Eastwood Milkweed

According to the SWReGAP land cover model, potentially suitable habitats do not occur in the SEZ or transmission corridor; however, these suitable habitats may occur within the area of indirect effects (Table 11.6.12.1-1). Although SWReGAP did not map any wash habitat on the SEZ, there appear to be numerous washes that could provide habitat for this species on the SEZ, in the transmission corridor, and in the area of indirect effects, including Jackson Wash and its tributaries. The area of these washes has not been quantified, but they could be affected by construction and operations of solar energy development on the SEZ (Table 11.6.12.1-1). About 420 acres (1.5 km^2) of potentially suitable mapped habitat occurs in the area of indirect effects; this area represents about 1.1% of the potentially suitable habitat in the SEZ region (Table 11.6.12.1-1).

Impacts of solar energy development in the Gold Point SEZ on the Eastwood milkweed cannot be determined without quantification of the amount of potentially suitable wash habitat in the area of direct effects, but is expected to be small given the unquantified, but apparently large amount of wash habitat in the SEZ region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts to negligible levels.

Avoiding or minimizing disturbance to wash habitat in the area of direct effects could reduce direct impacts on the Eastwood milkweed. In addition, pre-disturbance surveys and

avoiding or minimizing disturbance to occupied habitats in the area of direct effects could reduce impacts. 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 used one or more of these options could be designed to completely offset the impacts of development.

Holmgren Lupine

The Holmgren lupine is not known to occur in the affected area of the Gold Point SEZ. According to the SWReGAP land cover model, potentially suitable sagebrush and pinyon-juniper woodland habitats do not occur on the SEZ. However, approximately 10 acres (<0.1 km^2) of potentially suitable habitat in the transmission corridor could be directly affected by construction and operations (Table 11.6.12.1-1). This direct effects area represents less than 0.1% of potentially suitable habitat in the SEZ region. About 27,300 acres (110 km^2) of potentially suitable habitat occurs in the area of indirect effects; this area represents about 1.8% of the potentially suitable habitat in the SEZ region (Table 11.6.12.1-1).

The overall impact on the Holmgren lupine from construction, operation, and decommissioning of utility-scale solar energy facilities within the Gold Point 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 SEZ region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts to negligible levels.

Avoiding or minimizing disturbance to sagebrush habitat in the transmission line corridor could reduce direct impacts on the Holmgren lupine. In addition, impacts could be reduced with the implementation of the mitigation options described previously for the Eastwood milkweed. The need for mitigation, other than programmatic design features, should be determined by conducting pre-disturbance surveys for the species and its habitat on the SEZ.

Tonopah Pincushion Cactus

The Tonopah pincushion cactus is not known to occur in the affected area of the Gold Point SEZ; however, approximately 3,850 acres (16 km^2) of potentially suitable habitat on the SEZ and 30 acres (0.1 km^2) of potentially suitable habitat in the transmission corridor could be directly affected by construction and operations (Table 11.6.12.1-1). This direct effects area represents 0.2% of potentially suitable habitat in the SEZ region. About 88,600 acres (559 km^2) of potentially suitable habitat occurs in the area of indirect effects; this area represents about 3.7% of the potentially suitable habitat in the SEZ region (Table 11.6.12.1-1).

The overall impact on the Tonopah pincushion cactus from construction, operation, and decommissioning of utility-scale solar energy facilities within the Gold Point 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 SEZ region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts to negligible levels.

Avoidance of all potentially suitable habitats to mitigate impacts on the Tonopah pincushion cactus is not feasible, because potentially suitable shrubland is widespread throughout the area of direct effects. However, impacts could be reduced with the implementation of programmatic design features and the mitigation options described previously for the Eastwood milkweed. The need for mitigation, other than programmatic design features, should be determined by conducting pre-disturbance surveys for the species and its habitat on the SEZ.

Ferruginous Hawk

The ferruginous hawk is a winter resident in the Gold Point SEZ region and is known to occur in Esmeralda County, Nevada. According to the SWReGAP habitat suitability model, approximately 200 acres (0.8 km^2) of potentially suitable habitat on the SEZ and 225 acres (0.9 km^2) of potentially suitable habitat in the transmission corridor could be directly affected by construction and operations (Table 11.6.12.1-1). This direct effects area represents less than 0.1% of potentially suitable habitat in the SEZ region. About 28,100 acres (114 km^2) of potentially suitable habitat occurs in the area of indirect effects; this area represents about 3.6% of the potentially suitable habitat in the SEZ region (Table 11.6.12.1-1).

The overall impact on the ferruginous hawk from construction, operation, and decommissioning of utility-scale solar energy facilities within the Gold Point 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 foraging habitat (shrublands) is not feasible, because suitable foraging habitat (shrublands) is widespread in the area of direct effects and readily available in other portions of the affected area.

Prairie Falcon

The prairie falcon is a year-round resident in the Gold Point SEZ region, and potentially suitable foraging and nesting habitat is expected to occur in the affected area. Approximately 4,500 acres (18 km^2) of potentially suitable habitat on the SEZ and 500 acres (2 km^2) of potentially suitable habitat within the transmission corridor could be directly affected by construction and operations (Table 11.6.12.1-1). This direct effects area represents 0.2% of potentially suitable habitat in the SEZ region. About 81,350 acres (329 km^2) of potentially suitable habitat occurs in the area of indirect effects; this area represents about 3.4% of the

potentially suitable habitat in the SEZ region (Table 11.6.12.1-1). Most of this area could serve as foraging habitat (open shrublands). On the basis of SWReGAP land cover data, potentially suitable nesting habitat (cliffs and rock outcrops) does not occur on the SEZ. However, approximately 350 acres (1.5 km^2) of cliff and rock outcrop habitat that may be potentially suitable nesting habitat occurs in the area of indirect effects.

The overall impact on the prairie falcon from construction, operation, and decommissioning of utility-scale solar energy facilities within the Gold Point 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 foraging habitat (shrublands) is not feasible, because suitable foraging habitat (shrublands) is widespread in the area of direct effects and readily available in other portions of the affected area.

Swainson's Hawk

The Swainson's hawk is a summer breeding resident within the Gold Point SEZ region and is known to occur in Esmeralda County, Nevada. According to the SWReGAP habitat suitability model, suitable habitat for this species does not occur on the SEZ. However, approximately 50 acres (0.2 km^2) of potentially suitable habitat within the transmission corridor could be directly affected by construction and operations (Table 11.6.12.1-1). This direct effects area represents less than 0.1% of potentially suitable habitat in the SEZ region. About 15,200 acres (62 km^2) of potentially suitable habitat occurs in the area of indirect effects; this area represents about 1.1% of the potentially suitable habitat in the SEZ region (Table 11.6.12.1-1). On the basis of SWReGAP land cover data, potentially suitable nesting habitat (solitary trees) does not occur on the SEZ or within the transmission corridor. However, approximately 80 acres (0.3 km^2) of woodland habitat (pinyon-juniper) that may be potentially suitable nesting habitat occurs in the area of indirect effects.

The overall impact on the Swainson's hawk from construction, operation, and decommissioning of utility-scale solar energy facilities within the Gold Point 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 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 foraging habitat (shrublands) is not feasible, because suitable foraging habitat (shrublands) is widespread in the area of direct effects and readily available in other portions of the affected area.

Western Burrowing Owl

The western burrowing owl is a summer breeding resident within the Gold Point SEZ region and is known to occur in Esmeralda County, Nevada. According to the SWReGAP habitat suitability model, approximately 4,625 acres (19 km^2) of potentially suitable habitat on the SEZ

and 650 acres (3 km^2) of potentially suitable habitat in the transmission corridor could be directly affected by construction and operations (Table 11.6.12.1-1). This direct effects area represents about 0.2% of potentially suitable habitat in the SEZ region. About 97,000 acres (393 km^2) of potentially suitable habitat occurs in the area of indirect effects; this area represents about 3.1% of the potentially suitable habitat in the SEZ region (Table 11.6.12.1-1). Most of this area could serve as foraging and nesting habitat (shrublands). The abundance of burrows suitable for nesting on the SEZ and in the area of indirect effects has not been determined.

The overall impact on the western burrowing owl from construction, operation, and decommissioning of utility-scale solar energy facilities within the Gold Point SEZ is considered small, because the amount of potentially suitable foraging and nesting habitat for this species in the area of direct effects represents less than 1% of potentially suitable foraging and nesting habitat in the region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts to negligible levels.

Avoidance of all potentially suitable habitats is not a feasible way to mitigate impacts on the western burrowing owl, because potentially suitable shrubland habitats are widespread throughout the area of direct effects and readily available in other portions of the SEZ region. Impacts on the western burrowing owl could be reduced by implementing programmatic design features, conducting pre-disturbance surveys, and avoiding or minimizing disturbance to occupied burrows and habitat on the SEZ. If avoidance or minimization is not feasible, a compensatory mitigation plan could be developed and implemented to mitigate direct effects. 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. The need for mitigation, other than programmatic design features, should be determined by conducting pre-disturbance surveys for the species and its habitat within the area of direct effects.

Brazilian Free-Tailed Bat

The Brazilian free-tailed bat is a year-round resident within the Gold Point SEZ region and is known to occur approximately 15 mi (24 km) west of the SEZ. According to the SWReGAP habitat suitability model, approximately 4,800 acres (19 km^2) of potentially suitable habitat on the SEZ and 590 acres (2 km^2) of potentially suitable habitat in the transmission corridor could be directly affected by construction and operations (Table 11.6.12.1-1). This direct effects area represents 0.2% of potentially suitable habitat in the SEZ region. About 83,500 acres (338 km^2) of potentially suitable habitat occurs in the area of indirect effects; this area represents about 3.1% of the available suitable habitat in the region (Table 11.6.12.1-1). Most of the potentially suitable habitat in the affected area is foraging habitat represented by desert shrubland. On the basis of an evaluation of SWReGAP land cover data, potentially suitable roost habitat (rocky cliffs and outcrops) does not occur on the SEZ or transmission corridor, but about 350 acres (1.5 km^2) of potentially suitable roost habitat may occur in the area of indirect effects.

The overall impact on the Brazilian free-tailed bat from construction, operation, and decommissioning of utility-scale solar energy facilities within the Gold Point 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 all potentially suitable foraging habitats is not feasible, because potentially suitable habitat is widespread throughout the area of direct effects and readily available in other portions of the SEZ region.

Fringed Myotis

The fringed myotis is a year-round resident within the Gold Point SEZ region and is known to occur in Esmeralda County, Nevada. According to the SWReGAP habitat suitability model, approximately 4,700 acres (19 km^2) of potentially suitable habitat on the SEZ and 620 acres (2.5 km^2) of potentially suitable habitat in the transmission corridor could be directly affected by construction and operations (Table 11.6.12.1-1). This direct effects area represents 0.2% of potentially suitable habitat in the SEZ region. About 88,200 acres (357 km^2) of potentially suitable habitat occurs in the area of indirect effects; this area represents about 2.9% of the available suitable habitat in the region (Table 11.6.12.1-1). Most of the potentially suitable habitat in the affected area is foraging habitat represented by desert shrubland. On the basis of an evaluation of SWReGAP land cover data, potentially suitable roost habitat (buildings and caves) does not occur on the SEZ or in the transmission corridor, but about 350 acres (1.5 km^2) of potentially suitable roost habitat may occur in the area of indirect effects.

The overall impact on the fringed myotis from construction, operation, and decommissioning of utility-scale solar energy facilities within the Gold Point 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 all potentially suitable foraging habitats is not feasible, because potentially suitable habitat is widespread throughout the area of direct effects and readily available in other portions of the SEZ region.

Nelson's Bighorn Sheep

The Nelson's bighorn sheep occurs within the affected area of the Gold Point SEZ, but suitable range habitat is not expected to occur on the SEZ. According to the SWReGAP habitat suitability model; however, approximately 150 acres (0.6 km^2) of potentially suitable habitat within the transmission corridor could be directly affected by construction and operations (Table 11.6.12.1-1). This direct effects area represents less than 0.1% of potentially suitable habitat in the SEZ region. About 24,100 acres (98 km^2) of potentially suitable habitat occurs in the area of indirect effects; this area represents about 2.6% of the available suitable habitat in the region (Table 11.6.12.1-1). Despite the apparent lack of suitable habitat on the SEZ, the Nelson's bighorn sheep may utilize portions of the SEZ as a migratory corridor between range habitats.

The overall impact on the Nelson's bighorn sheep from construction, operation, and decommissioning of utility-scale solar energy facilities within the Gold Point 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 the 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.

Direct impacts on the Nelson's bighorn sheep could be reduced to small or negligible levels by conducting pre-disturbance surveys and avoiding or minimizing disturbance to occupied habitats and important movement corridors within 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. The need for mitigation should first be determined by conducting pre-disturbance surveys for the species and its habitat within the area of direct effects.

Pallid Bat

The pallid bat is a year-round resident within the Gold Point SEZ region and is known to occur approximately 15 mi (24 km) west of the SEZ. According to the SWReGAP habitat suitability model, approximately 4,550 acres (18 km^2) of potentially suitable habitat on the SEZ and 575 acres (2.5 km^2) of potentially suitable habitat in the transmission corridor could be directly affected by construction and operations (Table 11.6.12.1-1). This direct effects area represents 0.2% of potentially suitable habitat in the SEZ region. About 83,175 acres (337 km^2) of potentially suitable habitat occurs in the area of indirect effects; this area represents about 3.2% of the available suitable habitat in the region (Table 11.6.12.1-1). Most of the potentially suitable habitat in the affected area is foraging habitat represented by desert shrubland. On the basis of an evaluation of SWReGAP land cover data, potentially suitable roost habitat (caves and crevices) does not occur on the SEZ or in the transmission corridor, but about 350 acres (1.5 km^2) of potentially suitable roost habitat may occur in the area of indirect effects.

The overall impact on pallid bat from construction, operation, and decommissioning of utility-scale solar energy facilities within the Gold Point 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 all potentially suitable foraging habitats is not feasible, because potentially suitable habitat is widespread throughout the area of direct effects and readily available in other portions of the SEZ region.

Silver-Haired Bat

The silver-haired bat is a year-round resident within the Gold Point SEZ region and is known to occur approximately 15 mi (25 km) west of the SEZ. According to the SWReGAP

habitat suitability model, approximately 4,600 acres (19 km^2) of potentially suitable habitat on the SEZ and 580 acres (2.5 km^2) of potentially suitable habitat in the transmission corridor could be directly affected by construction and operations (Table 11.6.12.1-1). This direct effects area represents 0.2% of potentially suitable habitat in the SEZ region. About 83,200 acres (337 km^2) of potentially suitable habitat occurs in the area of indirect effects; this area represents about 3.2% of the available suitable habitat in the region (Table 11.6.12.1-1). Most of the potentially suitable habitat in the affected area is foraging habitat represented by desert shrubland. On the basis of an evaluation of SWReGAP land cover data, potentially suitable roost habitat (woodlands) does not occur on the SEZ or in the transmission corridor, but about 80 acres (0.3 km^2) of potentially suitable roost habitat may occur in the area of indirect effects.

The overall impact on the silver-haired bat from construction, operation, and decommissioning of utility-scale solar energy facilities within the Gold Point 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 all potentially suitable foraging habitats is not feasible, because potentially suitable habitat is widespread throughout the area of direct effects and readily available in other portions of the SEZ region.

Spotted Bat

The spotted bat is a year-round resident within the Gold Point SEZ region and is known to occur approximately 15 mi (24 km) west of the SEZ. According to the SWReGAP habitat suitability model, approximately 4,700 acres (19 km^2) of potentially suitable habitat on the SEZ and 550 acres (2 km^2) of potentially suitable habitat in the transmission corridor could be directly affected by construction and operations (Table 11.6.12.1-1). This direct effects area represents 0.2% of potentially suitable habitat in the SEZ region. About 76,750 acres (311 km^2) of potentially suitable habitat occurs in the area of indirect effects; this area represents about 3.2% of the available suitable habitat in the region (Table 11.6.12.1-1). Most of the potentially suitable habitat in the affected area is foraging habitat represented by desert shrubland. On the basis of an evaluation of SWReGAP land cover data, potentially suitable roost habitat (caves and crevices) does not occur on the SEZ or transmission corridor, but about 350 acres (1.5 km^2) of potentially suitable roost habitat may occur in the area of indirect effects.

The overall impact on the spotted bat from construction, operation, and decommissioning of utility-scale solar energy facilities within the Gold Point 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 all potentially suitable foraging habitats is not feasible, because potentially suitable habitat is widespread throughout the area of direct effects and readily available in other portions of the SEZ region.

Townsend's Big-Eared Bat

The Townsend's big-eared bat is a year-round resident within the Gold Point SEZ region and is known to occur approximately 8 mi (13 km) west of the SEZ. According to the SWReGAP habitat suitability model, approximately 4,600 acres (19 km^2) of potentially suitable habitat on the SEZ and 450 acres (2 km^2) of potentially suitable habitat in the transmission corridor could be directly affected by construction and operations (Table 11.6.12.1-1). This direct effects area represents 0.2% of potentially suitable habitat in the SEZ region. About 68,550 acres (277 km^2) of potentially suitable habitat occurs in the area of indirect effects; this area represents about 2.9% of the available suitable habitat in the region (Table 11.6.12.1-1). Most of the potentially suitable habitat in the affected area is foraging habitat represented by desert shrubland. On the basis of an evaluation of SWReGAP land cover data, potentially suitable roost habitat (caves and rocky cliffs and outcrops) does not occur on the SEZ or in the transmission corridor, but about 350 acres (1.5 km^2) of potentially suitable roost habitat may occur in the area of indirect effects.

The overall impact on the Townsend's big-eared bat from construction, operation, and decommissioning of utility-scale solar energy facilities within the Gold Point 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 all potentially suitable foraging habitats is not feasible, because potentially suitable habitat is widespread throughout the area of direct effects and readily available in other portions of the SEZ region.

Western Small-Footed Myotis

The western small-footed myotis is a year-round resident within the Gold Point SEZ region and is known to occur approximately 9 mi (14 km) south of the SEZ. According to the SWReGAP habitat suitability model, approximately 4,800 acres (19 km^2) of potentially suitable habitat on the SEZ and 650 acres (2.5 km^2) of potentially suitable habitat in the transmission corridor could be directly affected by construction and operations (Table 11.6.12.1-1). This direct impact area represents 0.2% of potentially suitable habitat in the SEZ region. About 97,950 acres (396 km^2) of potentially suitable habitat occurs in the area of indirect effects; this area represents about 2.9% of the available suitable habitat in the region (Table 11.6.12.1-1). Most of the potentially suitable habitat in the affected area is foraging habitat represented by desert shrubland. On the basis of an evaluation of SWReGAP land cover data, potentially suitable roost habitat (rocky cliffs and outcrops) does not occur on the SEZ or in the transmission corridor, but about 350 acres (1.5 km^2) of potentially suitable roost habitat may occur in the area of indirect effects.

The overall impact on the western small-footed myotis from construction, operation, and decommissioning of utility-scale solar energy facilities within the Gold Point 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 all potentially suitable foraging habitats is not feasible, because potentially suitable habitat is widespread throughout the area of direct effects and readily available in other portions of the SEZ region.

11.6.12.2.5 Impacts on State-Listed Species

There are eight species listed by the State of Nevada that may occur in the Gold Point SEZ affected area or that may be affected by solar energy development on the SEZ (Table 11.6.12.1-1). Of these species, only the pale kangaroo mouse has not been previously discussed. Impacts on this species are discussed below.

The pale kangaroo mouse is known to occur in Esmeralda County, Nevada, although it is not known to occur in the affected area of the Gold Point SEZ. According to the SWReGAP habitat suitability model, approximately 4,700 acres (19 km^2) of potentially suitable habitat on the SEZ and 200 acres (0.8 km^2) of potentially suitable habitat in the transmission corridor could be directly affected by construction and operations (Table 11.6.12.1-1). This direct effects area represents 0.4% of potentially suitable habitat in the SEZ region. About 50,500 acres (204 km^2) of potentially suitable habitat occurs in the area of indirect effects; this area represents about 4.0% of the available suitable habitat in the region (Table 11.6.12.1-1).

The overall impact on the pale kangaroo mouse from construction, operation, and decommissioning of utility-scale solar energy facilities within the Gold Point 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 SEZ region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels.

Direct impacts on the pale kangaroo mouse could be further reduced by conducting pre-disturbance surveys and avoiding occupied habitats within 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. The need for mitigation should first be determined by conducting pre-disturbance surveys for the species and its habitat within the area of direct effects.

11.6.12.2.6 Impacts on Rare Species

There are 19 rare species (state rank of S1 or S2 in Nevada or a species of concern by the State of Nevada or the USFWS) that may be affected by solar energy development on the Gold Point SEZ. Five species—all plants—have not been previously discussed: Bullfrog Hills sweetpea, Clokey paintbrush, Panamint Mountains bedstraw, squalid milkvetch, and weasel

phacelia. Impacts and potentially applicable mitigation measures (if necessary) for each of these species is provided in Table 11.6.12.1-1. Additional life history information is provided in Appendix J.

11.6.12.3 SEZ-Specific Design Features and Design Feature Effectiveness

The implementation of required programmatic design features described in Appendix A, Section A.2.2, would greatly reduce or eliminate the potential for effects of utility-scale solar energy development on special status species. While some SEZ-specific design features are best established when specific project details are being considered, some design features can be identified at this time, including the following:

- Pre-disturbance surveys should be conducted within the SEZ to determine the presence and abundance of special status species, including those identified in Table 11.6.12.1-1; disturbance to occupied habitats for these species should 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 could reduce impacts. A comprehensive mitigation strategy for special status species that used one or more of these options to offset the impacts of development should be developed in coordination with the appropriate federal and state agencies.

- Avoiding or minimizing disturbance to desert wash and playa habitats within the area of direct effects could reduce or eliminate impacts on the Eastwood milkweed.

- Avoiding or minimizing disturbance to sagebrush habitat within the area of direct effects could reduce or eliminate impacts on the Holmgren lupine.

- Coordination with the USFWS and the NDOW should be conducted for the greater sage-grouse—a candidate species for listing under the ESA. Coordination would identify an appropriate survey protocol and mitigation requirements, which may include avoidance, minimization, translocation, or compensation.

- Harassment or disturbance of special status species and their habitats in the affected area should be avoided or minimized. This can be accomplished by identifying any additional sensitive areas and implementing necessary protection measures based upon consultation with the USFWS and the NDOW.

If these SEZ-specific design features are implemented in addition to required programmatic design features, impacts on the special status and rare species could be reduced.

11.6.13 Air Quality and Climate

11.6.13.1 Affected Environment

11.6.13.1.1 Climate

The proposed Gold Point SEZ is located in the southern portion of Esmeralda County in southwestern Nevada. Nevada lies on the eastern lee side of the Sierra Nevada Range, which markedly influences the climate of the state under the prevailing westerlies (NCDC 2010a). In addition, the mountains east and north of Nevada act as barriers to the cold arctic air masses, thus making long periods of extremely cold weather uncommon. The SEZ lies at an average elevation of about 4,960 ft (1,512 m) in the southwestern portion of the Great Basin Desert, which has a high desert climate marked by pleasant weather (mild winters and warm summers) with large daily temperature swings due to dry air, scant precipitation, low relative humidity, and abundant sunshine. Meteorological data collected at the Tonopah Airport, about 45 mi (72 km) north-northeast of the Gold Point SEZ boundary, and at Goldfield, about 20 mi (32 km) north-northeast, are summarized below.

A wind rose from the Tonopah Airport, taken at a level of 33 ft (10 m), for the 5-year period 2005 to 2009 is presented in Figure 11.6.13.1-1 (NCDC 2010b). During this period, the annual average wind speed at the airport was about 9.6 mph (4.3 m/s), with the prevailing wind direction from the north (about 19.7% of the time) and secondarily from the north-northwest (about 16.4% of the time). The northerly wind component predominates, with about 46.7% of wind directions from the northwest clockwise to the north. Winds blew more frequently from the north every month throughout the year except January and April, when wind blew more frequently from the north-northwest. Wind speeds categorized as calm (less than 1.1 mph [0.5 m/s]) occurred frequently (about 10% of the time) because of the stable conditions caused by strong radiative cooling from late night to sunrise. Average wind speeds were relatively uniform by season: they were highest in spring at 11.2 mph (5.0 m/s), lower in summer and fall at 9.2 mph (4.1 m/s), and lowest in winter at 9.0 mph (4.0 m/s).

For the period 1906 to 2009, the annual average temperature at Goldfield was 51.4°F (10.8°C) (WRCC 2010e). January was the coldest month, with an average minimum temperature of 20.3°F (–6.5°C), and July was the warmest, with an average maximum of 89.6°F (32.0°C). In the summer, daytime maximum temperatures higher than 90°F (32.2°C) are common, and minimums are in the 50s. The minimum temperatures recorded were below freezing (≤32°F [0°C]) throughout the year except July and August (with a peak of about 29 days in January and December), and subzero temperatures were recorded about 1.5 days per year during winter months. During the same period, the highest temperature, 108°F (42.2°C), was reached in July 1906 and the lowest, –23°F (−30.6°C), in January 1937. In a typical year, about 36 days had a maximum temperature of at least 90°F (32.2°C), while about 146 days had minimum temperatures at or below freezing.

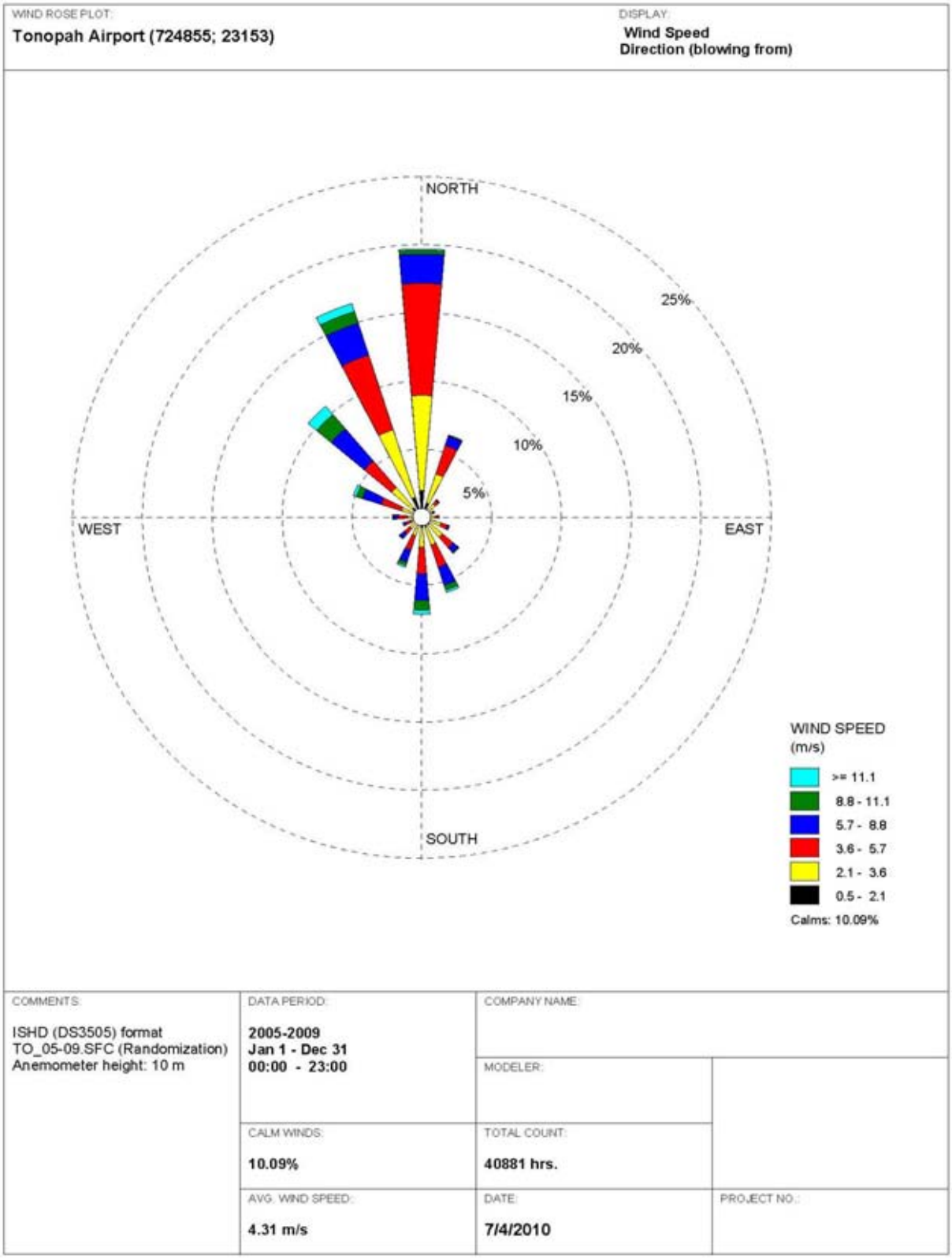

FIGURE 11.6.13.1-1 Wind Rose at 33 ft (10 m) at Tonopah Airport, Nevada, 2005 to 2009 (Source: NCDC 2010b)

Along with prevailing westerlies, Pacific air masses lose most of their moisture on the windward side of the Sierra Nevada Range parallel to Nevada's western boundary with California. Thus, leeward areas such as the region around Gold Point SEZ experience a lack of precipitation (NCDC 2010a). For 1906 to 2009, annual precipitation at Goldfield averaged about 6.06 in. (15.4 cm) (WRCC 2010e). On average, 29 days annually have measurable precipitation (0.01 in. [0.025 cm] or higher). Precipitation is relatively evenly distributed by season, although it is slightly higher in winter and spring than in summer and fall. Snow falls as early as October and continues as late as May; most of the snow falls from December to March. The annual average snowfall at Goldfield is about 17.8 in. (45.2 cm).

The proposed Gold Point SEZ is far from major water bodies (more than 240 mi [386 km] to the Pacific Ocean). Severe weather events, such as severe thunderstorms and tornadoes, are rare in Esmeralda County, which encompasses the Gold Point SEZ (NCDC 2010c).

In Nevada, flooding could occur from melting of heavy snowpack. On occasion, heavy summer thunderstorms also cause flooding of local streams, usually in sparsely populated mountainous areas, but they are seldom destructive (NCDC 2010a). Since 1997, four flash floods have been reported in Esmeralda County, two of which occurred about 10 mi (16 km) from the SEZ and one of which caused minor property damage.

In Esmeralda County, no hail storms have been reported (NCDC 2010c). Forty-two high wind events have been reported since 1999. Events with a maximum wind speed of up to 127 mph (57 m/s) can occur any month of the year, with peaks in March and June; they have caused no deaths or injuries but some property damage (NCDC 2010c). In addition, one thunderstorm wind event with a maximum wind speed of 52 mph (23 m/s) was reported in 2010, which caused minor property damage.

No dust storms have been reported in Esmeralda County (NCDC 2010c). However, the ground surface of the SEZ is covered primarily with sandy loams, gravelly sandy loams, and gravelly loams, which have a relatively moderate dust storm potential. High winds can trigger large amounts of blowing dust in areas of Esmeralda County that have dry and loose soils with sparse vegetation. Dust storms can deteriorate air quality and visibility and may have adverse effects on health, particularly for people with asthma or other respiratory problems.

Hurricanes and tropical storms formed off the coast of Central America and Mexico weaken over the cold waters off the California coast. Accordingly, hurricanes never hit Nevada, but one tropical depression has passed within 100 mi (160 km) of the proposed Gold Point SEZ (CSC 2010). Historically, only one tornado was reported in 1982 in Esmeralda County (NCDC 2010c). However, the tornado occurred far from the SEZ, was relatively weak (i.e., F0 on the Fujita tornado scale), and did not cause deaths, injuries, or property damage.

11.6.13.1.2 Existing Air Emissions

Esmeralda County has a few industrial emission sources related to minerals and mining, but their emissions are relatively small. All industrial sources are located far from the proposed Gold Point SEZ. Because of the sparse population, only a handful of major roads, such as U.S. 6, U.S. 95, and several State Routes (264, 265, 266, 773, and 774) are present in Esmeralda County. Thus, onroad mobile source emissions are not substantial. Data on annual emissions of criteria pollutants and volatile organic compounds (VOCs) in Esmeralda County are presented in Table 11.6.13.1-1 for 2002 (WRAP 2009). Emission data are classified into six source categories: point, area, onroad mobile, nonroad mobile, biogenic, and fire (wildfires, prescribed fires, agricultural fires, structural fires). In 2002, point sources were major contributors to total emissions of SO_2 (about 78%). Biogenic sources (i.e., vegetation—including trees, plants, and crops—and soils) that release naturally occurring emissions primarily contributed to NO_x and CO emissions (about 62% and 64%, respectively) and accounted for most of the VOC emissions (about 99%). Area sources were major contributors to total emissions of PM_{10} (about 96%) and $PM_{2.5}$ (about 91%), and secondary contributors to SO_2 emissions (about 20%). Onroad sources were secondary contributors to NO_x and CO emissions (about 30% and 35%, respectively). In Esmeralda County, nonroad sources were minor contributors to criteria pollutants and VOCs. (Fire emissions were not estimated in Esmeralda County in 2002.)

TABLE 11.6.13.1-1 Annual Emissions of Criteria Pollutants and VOCs in Esmeralda County, Nevada, Encompassing the Proposed Gold Point SEZ, 2002[a]

Pollutant[b]	Emissions (tons/yr)[c]
SO_2	106
NO_x	1,116
CO	13,832
VOCs	59,144
PM_{10}	937
$PM_{2.5}$	202

[a] Includes point, area, onroad and nonroad mobile, biogenic, and fire emissions.

[b] Notation: CO = carbon monoxide; NO_x = nitrogen oxides; $PM_{2.5}$ = particulate matter with a diameter of ≤2.5 μm; PM_{10} = particulate matter with a diameter of ≤10 μm; SO_2 = sulfur dioxide; and VOCs = volatile organic compounds.

[c] To convert tons to kilograms, multiply by 907.

Source: WRAP (2009).

In 2005, Nevada produced about 56.3 MMt of *gross*[5] carbon dioxide equivalent (CO_2e)[6] emissions, which is about 0.8% of total U.S. GHG emissions in that year (NDEP 2008). Gross GHG emissions in Nevada increased by about 65% from 1990 to 2005 because of Nevada's rapid population growth, compared to 16.3% growth in U.S. GHG emissions during the same period. In 2005, electrical generation (48%) and transportation (30%) were the primary contributors to gross GHG emission sources in Nevada. Fuel use in the residential, commercial, and industrial sectors combined accounted for about 12% of total state emissions. Nevada's *net* emissions were about 51.3 MMt CO_2e, considering carbon sinks from forestry activities and agricultural soils throughout the state. The EPA (2009a) also estimated

[5] Excluding GHG emissions removed as a result of forestry and other land uses and excluding GHG emissions associated with exported electricity.

[6] A measure used to compare the emissions from various GHGs on the basis of their global warming potential, defined as the cumulative radiative forcing effects of a gas over a specified time horizon resulting from the emission of a unit mass of gas relative to a reference gas, CO_2. The CO_2e for a gas is derived by multiplying the mass of the gas by the associated global warming potential.

2005 emissions in Nevada. Its estimate of CO_2 emissions from fossil fuel combustion was 49.6 MMt, which was comparable to the state's estimate. Electric power generation and transportation accounted for about 52.7% and 33.6% of the CO_2 emissions total, respectively, while the residential, commercial, and industrial sectors accounted for the remainder (about 13.7%).

11.6.13.1.3 Air Quality

The EPA set NAAQS for six criteria pollutants (EPA 2010a): SO_2, NO_2, CO, O_3, PM (PM_{10} and $PM_{2.5}$), and Pb. Nevada has its own SAAQS, which are generally similar to the NAAQS but with some differences (NAC 445B.22097). In addition, Nevada has set standards for 1-hour H_2S, which are not addressed by the NAAQS. The NAAQS and Nevada SAAQS for criteria pollutants are presented in Table 11.6.13.1-2.

Esmeralda County is located administratively in the Nevada Intrastate AQCR, along with 10 other counties in Nevada. Not included are Las Vegas Intrastate AQCR, including Clark County only, which encompasses Las Vegas; and Northwest Nevada Intrastate AQCR, including five northwest counties, which encompasses Reno. Currently, the area surrounding the proposed SEZ is designated as being in unclassifiable/attainment of NAAQS for all criteria pollutants (Title 40, Part 81, Section 329 of the *Code of Federal Regulations* [40 CFR 81.329]).

Because of Esmeralda County's low population density, it has no significant emission sources of its own and only minor mobile emissions along major highways. Accordingly, ambient air quality in Esmeralda County is relatively good. No ambient air-monitoring stations are located in Esmeralda County. To characterize ambient air quality around the SEZ, one monitoring station in Clark County was chosen as being representative of a rural environment: Jean, about 156 mi (251 km) southeast of the SEZ. The Jean station is located upwind of the Las Vegas area but to some extent its air quality is influenced by transport of air pollutants from the South Coast Air Basin, which includes Los Angeles, along with prevailing westerlies and nearby highway traffic on I-15 (about 1.6 mi [2.6 km] away). Ambient concentrations of NO_2, O_3, PM_{10}, and $PM_{2.5}$ are recorded at Jean. The East Sahara Avenue station, which is on the outskirts of Las Vegas, has only one SO_2 monitor in the area. The CO concentrations at the East Tonopah Avenue station in Las Vegas, which is the farthest downwind of Las Vegas among CO monitoring stations, were presented. No Pb measurements have been made in the State of Nevada because of low Pb concentration levels after the phase-out of leaded gasoline. The background concentrations of criteria pollutants at these stations for the period 2004 to 2008 are presented in Table 11.6.13.1-2 (EPA 2010b). Monitored concentration levels at either station were lower than their respective standards (up to 44%), except O_3, which approaches the 1-hour NAAQS/SAAQS and exceeds the 8-hour NAAQS. Except for PM_{10} and $PM_{2.5}$, ambient concentrations around the SEZ are anticipated to be lower than those presented in the table, which are mostly associated with industrial activities and road traffic in and around urban areas, However, PM_{10} and $PM_{2.5}$ might be either higher or lower, as their concentrations in arid non-urbanized areas may be influenced by windblown dust or agricultural activities.

The PSD regulations (see 40 CFR 52.21), which are designed to limit the growth of air pollution in clean areas, apply to a major new source or modification of an existing major

TABLE 11.6.13.1-2 NAAQS, SAAQS, and Background Concentration Levels Representative of the Proposed Gold Point SEZ in Esmeralda County, Nevada, 2004 to 2008

				Background Concentration Level	
Pollutant[a]	Averaging Time	NAAQS	SAAQS	Concentration[b,c]	Measurement Location, Year[d]
SO_2	1-hour	75 ppb[e]	NA[f]	NA	NA
	3-hour	0.5 ppm	0.5 ppm	0.009 ppm (1.8%)	Las Vegas, 2005
	24-hour	0.14 ppm	0.14 ppm	0.008 ppm (5.7%)	Las Vegas, 2005
	Annual	0.030 ppm	0.030 ppm	0.006 ppm (20%)	Las Vegas, 2005
NO_2	1-hour	100 ppb[g]	NA	NA	NA
	Annual	0.053 ppm	0.053 ppm	0.004 ppm (7.5%)	Jean, 2007
CO	1-hour	35 ppm	35 ppm	5.7 ppm (16%)	Las Vegas, 2004
	8-hour	9 ppm	9 ppm	3.9 ppm (43%)	Las Vegas, 2005
O_3	1-hour	0.12 ppm[h]	0.12 ppm	0.098 ppm (82%)	Jean, 2005
	8-hour	0.075 ppm	NA	0.083 ppm (111%)	Jean, 2007
PM_{10}	24-hour	150 μg/m^3	150 μg/m^3	66 μg/m^3 (44%)	Jean, 2008
	Annual	NA	50 μg/m^3	17 μg/m^3 (34%)	Jean, 2005
$PM_{2.5}$	24-hour	35 μg/m^3	NA	12.9 μg/m^3 (37%)	Jean, 2008
	Annual	15.0 μg/m^3	NA	4.9 μg/m^3 (33%)	Jean, 2008
Pb	Calendar quarter	1.5 μg/m^3	1.5 μg/m^3	NA	NA
	Rolling 3-month	0.15 μg/m^3 [i]	NA	NA	NA

[a] Notation: CO = carbon monoxide; NO_2 = nitrogen dioxide; O_3 = ozone; Pb = lead; $PM_{2.5}$ = particulate matter with a diameter of ≤2.5 μm; PM_{10} = particulate matter with a diameter of ≤10 μm; and SO_2 = sulfur dioxide.

[b] Monitored concentrations are the second-highest for all averaging times less than or equal to 24-hour averages, except fourth-highest daily maximum for 8-hour O_3 and the 98th percentile for 24-hour $PM_{2.5}$ and arithmetic mean for annual SO_2, NO_2, PM_{10}, and $PM_{2.5}$.

[c] Values in parentheses are background concentration levels as a percentage of NAAQS or SAAQS, respectively. Calculation of 1-hour SO_2 and NO_2 to NAAQS was not made, because no measurement data based on new NAAQS are available.

[d] All air monitoring stations listed are located in Clark County.

[e] Effective August 23, 2010.

[f] NA = not applicable or not available.

[g] Effective April 12, 2010.

[h] The EPA revoked the 1-hour O_3 standard in all areas, although some areas have continuing obligations under that standard ("anti-backsliding").

[i] Effective January 12, 2009.

Sources: EPA (2010a,b); NAC 445B.22097.

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source within an attainment or unclassified area (see Section 4.11.2.3). As a matter of policy, EPA recommends that the permitting authority notify the Federal Land Managers when a proposed PSD source would locate within 62 mi (100 km) of a sensitive Class I area. Several Class I areas are located around the Gold Point SEZ, two of which are situated within 62 mi (100 km): John Muir WA and Kings Canyon NP in California (40 CFR 81.405), about 58 mi (93 km) west and about 61 mi (98 km) west-southwest, respectively, of the proposed Gold Point SEZ. These Class I areas are not located downwind of prevailing winds at the Gold Point SEZ (Figure 11.6.13.1-1). The next nearest Class I areas in California include Sequoia NP, Ansel Adams WA, and Kaiser WA, which are about 71 mi (115 km) southwest, 84 mi (135 km) west-northwest, and 93 mi (150 km) west of the Gold Point SEZ, respectively.

11.6.13.2 Impacts

Potential impacts on ambient air quality associated with a solar project would be of most concern during the construction phase. Impacts on ambient air quality from fugitive dust emissions resulting from soil disturbances are anticipated, but they would be of short duration. During the operations phase, only a few sources with generally low levels of emissions would exist for any of the four types of solar technologies evaluated. A solar facility would either not burn fossil fuels or burn only small amounts during operation. (For facilities using HTFs, fuel could be used to maintain the temperature of the HTFs for more efficient daily start-up.) Conversely, use of solar facilities to generate electricity could displace air emissions that would otherwise be released from fossil fuel power plants.

Air quality impacts shared by all solar technologies are discussed in detail in Section 5.11.1, and technology-specific impacts are discussed in Section 5.11.2. Impacts specific to the proposed Gold Point SEZ are presented in the following sections. Any such impacts would be minimized through the implementation of required programmatic design features described in Appendix A, Section A.2.2, and through the application of any additional mitigation measures. Section 11.6.13.3, below, identifies SEZ-specific design features of particular relevance to the Gold Point SEZ.

11.6.13.2.1 Construction

The Gold Point SEZ site has a relatively flat terrain; thus, only a minimum number of site preparation activities, perhaps with no large-scale earthmoving operations, would be required. However, fugitive dust emissions from soil disturbances during the entire construction phase would be a major concern because of the large areas that would be disturbed in a region that experiences windblown dust problems. Fugitive dusts, which are released near ground level, typically have more localized impacts than similar emissions from an elevated stack with additional plume rise induced by buoyancy and momentum effects.

Methods and Assumptions

Air quality modeling for PM_{10} and $PM_{2.5}$ emissions associated with construction activities was performed by using the EPA-recommended AERMOD model (EPA 2009b). Details for emissions estimation, the description of AERMOD, input data processing procedures, and modeling assumption are described in Appendix M, Section M.13. Estimated air concentrations were compared with the applicable NAAQS/SAAQS levels at the site boundaries and nearby communities and with PSD increment levels at nearby Class I areas.[7] However, no receptors were modeled for PSD analysis at the nearest Class I area, John Muir WA in California, because this area is about 58 mi (93 km) from the SEZ, which is more than the maximum modeling distance of 31 mi (50 km) for the AERMOD. Rather, several regularly spaced receptors in the direction of the John Muir WA in California were selected as surrogates for the PSD analysis. For the Gold Point SEZ, the modeling was conducted based on the following assumptions and input:

- Uniformly distributed emissions of 3,000 acres (12.1 km^2) in the southern portion of the SEZ, close to the nearest residences near Gold Point,

- Surface hourly meteorological data from the Tonopah Airport[8] and upper air sounding data from the Mercury/Desert Rock Airport for the 2005 to 2009 period, and

- A regularly spaced receptor grid over a modeling domain of 62 × 62 mi (100 km × 100 km) centered on the proposed SEZ, and additional discrete receptors at the SEZ boundaries.

Results

The modeling results for concentration increments and total concentrations (modeled plus background concentrations) for both PM_{10} and $PM_{2.5}$ that would result from construction-related fugitive emissions are summarized in Table 11.6.13.2-1. Maximum 24-hour PM_{10} concentration increments modeled to occur at the site boundaries would be an estimated 465 $\mu g/m^3$, which far exceeds the relevant standard level of 150 $\mu g/m^3$. Total 24-hour PM_{10} concentrations of 531 $\mu g/m^3$ would also exceed the standard level at the SEZ boundary. However, high PM_{10}

[7] To provide a quantitative assessment, the modeled air impacts of construction were compared to the NAAQS/SAAQS levels and the PSD Class I increment levels. Although the Clean Air Act exempts construction activities from PSD requirements, a comparison with the Class I increment levels was used to quantify potential impacts. Only monitored data can be used to determine the attainment status. Modeled data are used to assess potential problems and as a consideration in the permitting process.

[8] The number of missing hours at the Tonopah Airport amounts to about 17.6% of the total hours, which may not be acceptable for regulatory applications because that percentage exceeds the 10% limit defined by the EPA. However, because the wind patterns at Tonopah Airport are more representative of wind at the Gold Point SEZ than the wind patterns at other airports (which have more complete data but are located in different topographic features), the former values were used for the screening analysis.

TABLE 11.6.13.2-1 Maximum Air Quality Impacts from Emissions Associated with Construction Activities for the Proposed Gold Point SEZ

Pollutant[a]	Averaging Time	Rank[b]	Concentration ($\mu g/m^3$)				Percentage of NAAQS/SAAQS	
			Maximum Increment[b]	Background[c]	Total	NAAQS/ SAAQS	Increment	Total
PM_{10}	24 hours	H6H	465	66.0	531	150	310	354
	Annual	–[d]	68.3	17.0	85.3	50	137	171
$PM_{2.5}$	24 hours	H8H	27.8	12.9	40.7	35	79	116
	Annual	–	6.8	4.9	11.8	15.0	46	78

[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 11.6.13.1-2.

[d] A dash indicates not applicable.

concentrations would be limited to the immediate areas surrounding the SEZ boundary and would decrease quickly with distance. Predicted maximum 24-hour PM_{10} concentration increments would be about 15 $\mu g/m^3$ at Gold Point (closest town, about 2 mi [3 km] south of the SEZ), about 3 $\mu g/m^3$ at Lida, and about 2 $\mu g/m^3$ or less at Goldfield and Silver Peak. Annual average modeled concentration increments and total concentrations (increment plus background) for PM_{10} at the SEZ boundary would be about 68.3 $\mu g/m^3$ and 85.3 $\mu g/m^3$, respectively, both of which are higher than the SAAQS level of 50 $\mu g/m^3$. Annual PM_{10} increments would be much lower, about 2.5 $\mu g/m^3$ at Gold Point, about 0.1 $\mu g/m^3$ at Lida, and less than 0.1 $\mu g/m^3$ at Goldfield and Silver Peak. Total 24-hour $PM_{2.5}$ concentrations would be 40.7 $\mu g/m^3$ at the SEZ boundary, which is higher than the NAAQS level of 35 $\mu g/m^3$; modeled increments contribute about two times the amount of background concentration to this total. The total annual average $PM_{2.5}$ concentration would be 11.8 $\mu g/m^3$, which is lower than the NAAQS level of 15.0 $\mu g/m^3$. At Gold Point, predicted maximum 24-hour and annual $PM_{2.5}$ concentration increments would be about 1.0 and 0.3 $\mu g/m^3$, respectively.

Predicted 24-hour and annual PM_{10} concentration increments at the surrogate receptors for the nearest Class I Area—John Muir WA, California—would be about 4.1 $\mu g/m^3$ and 0.06 $\mu g/m^3$, or 51% and 1.5% of the PSD increments for the Class I area, respectively. These surrogate receptors are more than 28 mi (46 km) from the John Muir WA, and thus, predicted concentrations in John Muir WA would be lower than the above values (about 27% of the PSD increments for 24-hour PM_{10}), considering the same decay ratio with distance.

In conclusion, 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. Annual $PM_{2.5}$ concentration levels are predicted to be lower than the standard level. Modeling indicates that emissions from construction activities are not anticipated to exceed Class I PSD PM_{10} increments at the nearest federal Class I area (John Muir WA in California). Construction activities are not subject to the PSD program, and the comparison provides only a screen for gauging the magnitude of the impact. Accordingly, it is anticipated that impacts of construction activities on ambient air quality would be moderate and temporary.

Emissions from the engine exhaust from heavy construction equipment and vehicles have the potential to cause impacts on AQRVs (e.g., visibility and acid deposition) at the nearby federal Class I areas. However, SO_x emissions from engine exhaust would be very low, because programmatic design features would require ultra-low-sulfur fuel with a sulfur content of 15 ppm. NO_x emissions from engine exhaust would be primary contributors to potential impacts on AQRVs. Construction-related emissions are temporary in nature and thus would cause some unavoidable but short-term impacts.

Transmission lines within a designated ROW would be constructed to connect to the nearest regional grid. A regional 120-kV transmission line is located about 22 mi (35 km) from the proposed Gold Point SEZ; thus, construction of a transmission line over this relatively long distance would likely be needed. Construction activities would result in fugitive dust emissions from soil disturbance and engine exhaust emissions from heavy equipment and vehicles. Construction time for the transmission line could be about 2 years. However, the site of construction along the transmission line ROW would move continuously, so no particular area would be exposed to air emissions for a prolonged period. Therefore, potential air quality impacts on nearby residences along the transmission line ROW, if any, would be minor and temporary in nature.

11.6.13.2.2 Operations

Emission sources associated with the operation of a solar facility would include auxiliary boilers; vehicle (commuter, visitor, support, and delivery) traffic; maintenance (e.g., mirror cleaning and repair and replacement of damaged mirrors); and drift from cooling towers for the parabolic trough or power-tower technology, if wet cooling was implemented (drift constitutes low-level PM emissions).

The type of emission sources caused by and offset by operation of a solar facility are discussed in Section M.13.4 of Appendix M.

Estimates of potential air emissions displaced by solar project development at the Gold Point SEZ are presented in Table 11.6.13.2-2. Total power generation capacity ranging from 428 to 770 MW is estimated for the Gold Point SEZ for various solar technologies

TABLE 11.6.13.2-2 Annual Emissions from Combustion-Related Power Generation Avoided by Full Solar Development of the Proposed Gold Point SEZ

Area Size (acres)	Capacity (MW)[a]	Power Generation (GWh/yr)[b]	Emissions Displaced (tons/yr; 10^3 tons/yr for CO_2)[c]			
			SO_2	NO_x	Hg	CO_2
4,810	428–770	749–1,348	1,057–1,902	906–1,632	0.006–0.011	582–1,047
Percentage of total emissions from electric power systems in Nevada[d]			2.0–3.6%	2.0–3.6%	2.0–3.6%	2.0–3.6%
Percentage of total emissions from all source categories in Nevada[e]			1.6–2.9%	0.60–1.1%	–[f]	1.1–1.9%
Percentage of total emissions from electric power systems in the six-state study area[d]			0.42–0.76%	0.25–0.44%	0.21–0.37%	0.22–0.40%
Percentage of total emissions from all source categories in the six-state study area[e]			0.22–0.40%	0.03–0.06%	–	0.07–0.13%

[a] 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.

[b] A capacity factor of 20% was assumed.

[c] 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.

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

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

[f] A dash indicates not estimated.

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

(see Section 11.6.2). The estimated amount of emissions avoided for the solar technologies evaluated depends only on the megawatts of conventional fossil fuel–generated power displaced, because a composite emission factor per megawatt-hour of power by conventional technologies is assumed (EPA 2009c). It is estimated that if the Gold Point SEZ eventually had development on 80% of its land, emissions avoided could range from 2.0 to 3.6% of total emissions of SO_2, NO_x, Hg, and CO_2 from electric power systems in the State of Nevada (EPA 2009c). Avoided emissions could be up to 0.76% of total emissions from electric power systems in the six-state study area. When compared to all source categories, power production from the same solar facilities could displace up to 2.9% of SO_2, 1.1% of NO_x, and 1.9% of CO_2 emissions in the State of Nevada (EPA 2009a; WRAP 2009). These emissions could be up to 0.40% of total emissions from all source categories in the six-state study area. Power generation from fossil fuel–fired power plants accounts for about 93% of the total electric power generated in Nevada (EPA 2009c). The contribution of natural gas combustion is about 47%, followed by that of coal

combustion at about 45%. Thus, solar facilities built in the Gold Point SEZ could displace relatively more fossil fuel emissions than those built in other states that rely less on fossil fuel–generated power.

As discussed in Section 5.11.1.5, the operation of associated transmission lines would generate some air pollutants from activities such as periodic site inspections and maintenance. However, these activities would occur infrequently, and the amount of emissions would be small. In addition, transmission lines could produce minute amounts of O_3 and its precursor NO_x associated with corona discharge (i.e., the breakdown of air near high-voltage conductors), which is most noticeable for high-voltage lines during rain or very humid conditions. Since the proposed Gold Point SEZ is located in an arid desert environment, these emissions would be small, and potential impacts on ambient air quality associated with transmission lines would be negligible, considering the infrequent occurrences and small amount of emissions from corona discharges.

11.6.13.2.3 Decommissioning/Reclamation

As discussed in Section 5.11.1.4, decommissioning/reclamation activities are similar to construction activities but occur on a more limited scale and are of shorter duration. Potential impacts on ambient air quality would be correspondingly smaller than those from construction activities. Decommissioning activities would last for a short period, and their potential impacts would be moderate and temporary. The same mitigation measures adopted during the construction phase would also be implemented during the decommissioning phase (Section 5.11.6).

11.6.13.3 SEZ-Specific Design Features and Design Feature Effectiveness

No SEZ-specific design features are required. Limiting dust generation during construction and operations at the proposed Gold Point SEZ (such as increased watering frequency or road paving or treatment) is a required 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.

11.6.14 Visual Resources

11.6.14.1 Affected Environment

The proposed Gold Point SEZ is located in Esmeralda County in southwestern Nevada. The SEZ occupies 4,810 acres (19.47 km^2) within Lida Valley. It extends about 2.5 mi (4.0 km) north–south and is about 4.0 mi (6.4 km) wide. The SEZ ranges in elevation from 4,840 ft (1,475 m) in the northeastern portion to 5,050 ft (1,539 m) in the northwestern portion.

The SEZ is within the Central Basin and Range Level III ecoregion, which consists of northerly trending fault-block ranges and intervening drier basins. Valleys, lower slopes, and alluvial fans are either shrub- and grass-covered or shrub-covered. Higher elevation mountain slopes support woodland, mountain brush, and scattered forests. The land is used primarily for grazing, with some irrigated cropland in valleys near mountain water sources. Gold Point SEZ is located within the Tonopah Basin Level IV ecoregion, which is a transition between the Great Basin and the more southerly Mojave Desert. It is typified by broad, nearly flat to rolling valleys containing lake plains, scattered hills, alluvial fans, bajadas, sand dunes, and hot springs. Ephemeral washes occur. Surface water comes from springs and sporadic foothill precipitation events, but is generally scarce (Bryce et al. 2003).

The SEZ occupies a narrow northeast-to-southwest trending valley surrounded by mountains. Although scenic quality within the SEZ itself is low, the nearby mountains add substantially to the overall visual qualities within the SEZ viewshed. Magruder Mountain (elevation 9,044 ft [2,756 m]), located west of the SEZ, is sacred to the Timbisha Shoshone. Mt. Jackson at 6,411 ft (1,954 m) is north of the SEZ. The mountain slopes and peaks surrounding the SEZ generally are visually pristine. The SEZ and surrounding mountain ranges are shown in Figure 11.6.14.1-1.

The SEZ is flat to slightly sloping, with the strong horizon line and surrounding mountain ranges being the dominant visual features. There is very little topographic relief, with playas occurring in the northeast portion of the SEZ, and washes that slope downward slightly from southwest to northeast. The surrounding mountains are generally a muted brown, with white and dark accents in some areas; more distant mountains appear blue to purple. In contrast, pink, tan, and gray gravels dominate the desert floor, which is sparsely dotted with the subtle greens, browns, and grays of vegetation. No permanent surface water is present within the SEZ.

Vegetation is generally sparse in much of the SEZ, with widely spaced shrubs growing on more or less barren gravel flats. Vegetation within the SEZ is predominantly scrubland, with shadscale, greasewood, and winterfat dominating the desert floor. Small Joshua trees add short vertical accents and color contrasts that add visual interest to portions of the SEZ. During an August 2009 site visit, the vegetation presented a range of muted greens, grays, and browns, with medium to coarse textures. Visual interest is generally low.

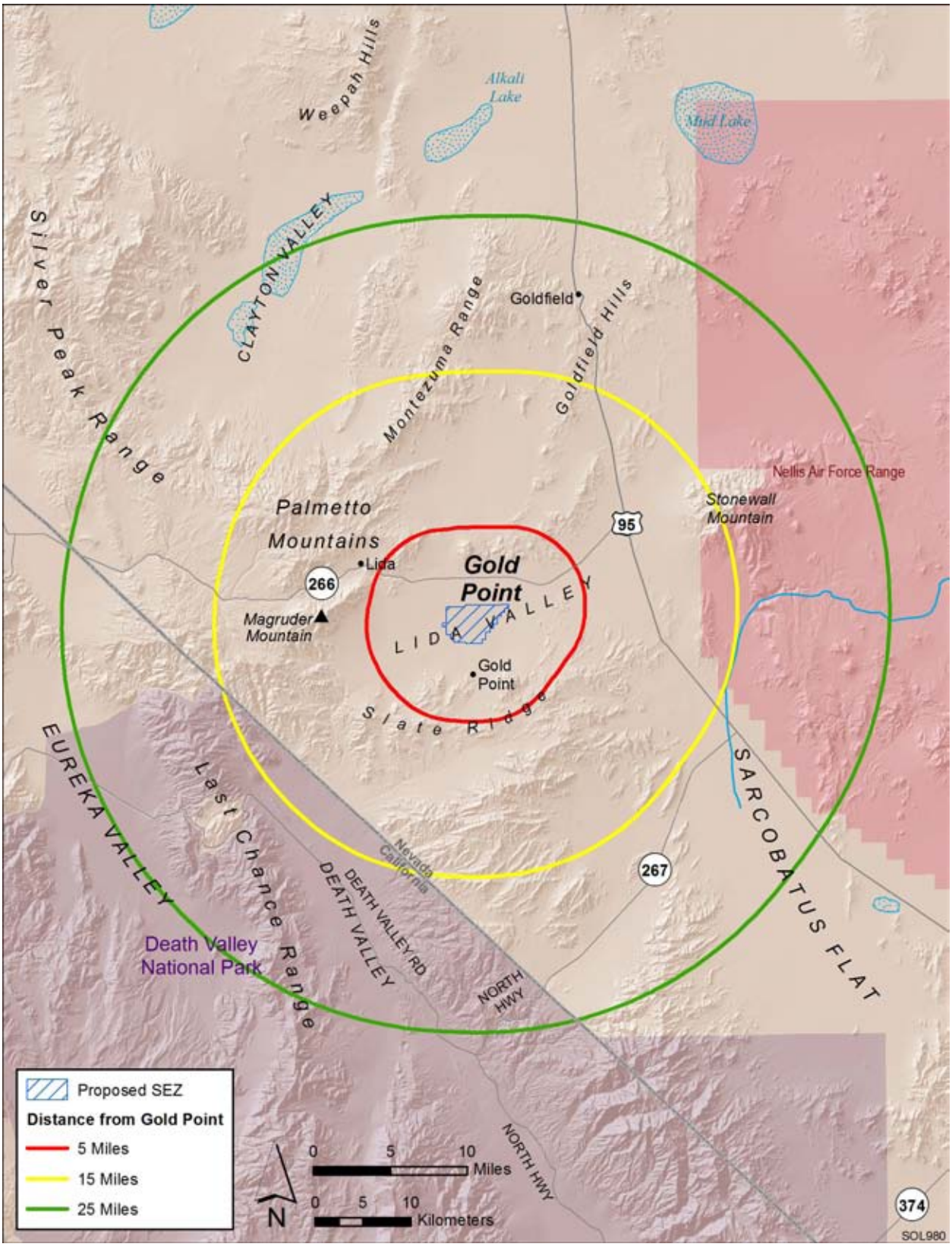

FIGURE 11.6.14.1-1 Proposed Gold Point SEZ and Surrounding Lands

Other than roads, transmission lines, and the very small community of Gold Point visible south of the SEZ, the area is relatively free of cultural modifications that would detract from the scenic qualities of the landscape. Upslope roads provide a noticeable line contrast in the landscape.

The general lack of topographic relief, water, and physical variety results in low scenic value within the SEZ itself; however, because of the flatness of the landscape, the lack of trees, and the breadth of the open desert, the SEZ presents a vast panoramic landscape with sweeping views of the surrounding mountains that add significantly to the scenic values within the SEZ viewshed. In general, the mountains appear to be devoid of vegetation, and their varied and irregular forms and muted brown colors provide visual contrasts to the strong horizontal line, particularly when viewed from nearby locations within the SEZ. Panoramic views of the SEZ are shown in Figures 11.6.14.1-2, 11.6.14.1-3, and 11.6.14.1-4.

The BLM conducted a visual resource inventory (VRI) for the SEZ and surrounding lands in 2010; however, the VRI was not completed in time for the new data to be included in the draft PEIS. The new VRI data will be incorporated into the analyses presented in the final PEIS. The VRI evaluates BLM-administered lands on the basis of scenic quality; sensitivity level, in terms of public concern for preservation of scenic values in the evaluated lands; and distance from travel routes or KOPs. Based on these three factors, BLM-administered lands are placed into one of four VRI Classes, which represent the relative value of the visual resources. Class I and II are the most valued; Class III represents a moderate value; and Class IV represents the least value. Class I is reserved for specially designated areas, such as national wildernesses and other congressionally and administratively designated areas where decisions have been made to preserve a natural landscape. Class II is the highest rating for lands without special designation. More information about VRI methodology is presented in Section 5.12 and in *Visual Resource Inventory*, BLM Manual Handbook 8410-1 (BLM 1986a).

The Tonopah Resource Management Plan (BLM 1997) indicates that the SEZ and surrounding area is managed as VRM Class IV, which permits major modification of the existing character of the landscape. More information about the BLM VRM program is presented in Section 5.12 and in *Visual Resource Management*, BLM Manual Handbook 8400 (BLM 1984).

11.6.14.2 Impacts

The potential for impacts from utility-scale solar energy development on visual resources within the proposed Gold Point SEZ and surrounding lands, as well as the impacts of related projects (e.g., access roads and transmission lines) outside of the SEZ, is presented in this section.

Site-specific impact assessment is needed to systematically and thoroughly assess visual impact levels for a particular project. Without precise information about the location of a project and a relatively complete and accurate description of its major components and their layout, it is not possible to assess precisely the visual impacts associated with the facility. However, if the general nature and location of a facility are known, a more generalized assessment of potential

FIGURE 11.6.14.1-2 Approximately 120° Panoramic View of the Proposed Gold Point SEZ from Northwest Corner of the SEZ Facing Southeast, with Mount Dunfee and Slate Ridge in Background

FIGURE 11.6.14.1-3 Approximately 180° Panoramic View of the Proposed Gold Point SEZ from Southwestern Portion of SEZ Facing Northeast, with Magruder Mountain at Left, Mt. Jackson and Mt. Jackson Ridge at Right

FIGURE 11.6.14.1-4 Approximately 120° Panoramic View of the Proposed Gold Point SEZ from Southeastern Edge of SEZ Facing West-Southwest, with Slate Ridge at Left, Last Chance Mountains at Far Background Center, and Magruder Mountain at Right

visual impacts can be made by describing the range of expected visual changes and discussing contrasts typically associated with these changes. In addition, a general analysis can identify sensitive resources that may be at risk if a future project is sited in a particular area. Detailed information about the methodology employed for the visual impact assessment used in this PEIS, including assumptions and limitations, is presented in Appendix M.

Potential Glint and Glare Impacts. Similarly, the nature and magnitude of potential glint- and glare-related visual impacts for a given solar facility is highly dependent on viewer position, sun angle, the nature of the reflective surface and its orientation relative to the sun and the viewer, atmospheric conditions and other variables. The determination of potential impacts from glint and glare from solar facilities within a given proposed SEZ would require precise knowledge of these variables, and is not possible given the scope of the PEIS. Therefore, the following analysis does not describe or suggest potential contrast levels arising from glint and glare for facilities that might be developed within the SEZ; however, it should be assumed that glint and glare are possible visual impacts from *any* utility-scale solar facility, regardless of size, landscape setting, or technology type. The occurrence of glint and glare at solar facilities could potentially cause large though temporary increases in brightness and visibility of the facilities. The visual contrast levels projected for sensitive visual resource areas discussed in the following analysis do not account for potential glint and glare effects; however, these effects would be incorporated into a future site-and project-specific assessment that would be conducted for specific proposed utility-scale solar energy projects. For more information about potential glint and glare impacts associated with utility-scale solar energy facilities, see Section 5.12 of this PEIS.

11.6.14.2.1 Impacts on the Proposed Gold Point SEZ

Some or all of the SEZ could be developed for one or more utility-scale solar energy projects, utilizing one or more of the solar energy technologies described in Appendix F. Because of the industrial nature and large size of utility-scale solar energy facilities, large visual impacts on the SEZ would occur as a result of their construction, operation, and decommissioning. In addition, large impacts could occur at solar facilities incorporating highly reflective surfaces or major light-emitting components (solar dish, parabolic trough, and power tower technologies), with lesser impacts associated with reflective surfaces expected from PV facilities. These impacts would be expected to involve major modification of the existing character of the landscape and would likely dominate the views nearby. Additional, and potentially large impacts could occur as a result of the construction, operation, and decommissioning of related facilities, such as access roads and electric transmission lines. While the primary visual impacts associated with solar energy development within the SEZ would occur during daylight hours, lighting required for utility-scale solar energy facilities would be a potential source of visual impacts at night, both within the SEZ and on surrounding lands.

Common and technology-specific visual impacts from utility-scale solar energy development, as well as impacts associated with electric transmission lines, are discussed in Section 5.12 of this PEIS. Impacts would last throughout construction, operation, and decommissioning, and some impacts could continue after project decommissioning. Visual

impacts resulting from solar energy development in the SEZ would be in addition to impacts from solar energy development and other development that may occur on other public or private lands within the SEZ viewshed. For discussion of cumulative impacts, see Section 11.6.22.4.13 of this PEIS.

The changes described above would be expected to be consistent with BLM VRM objectives for VRM Class IV, as seen from nearby KOPs. As noted above, the lands that include the SEZ are currently managed as VRM Class IV. More information about impact determination using the BLM VRM program is presented in Section 5.12 and in *Visual Resource Contrast Rating*, BLM Manual Handbook 8431-1 (BLM 1986b).

Implementation of the programmatic design features intended to reduce visual impacts (described in Appendix A, Section A.2.2) would be expected to reduce visual impacts associated with utility-scale solar energy development within the SEZ; however, the degree of effectiveness of these design features could be assessed only 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 would generally be limited, but would be important to reduce visual contrasts to the greatest extent possible.

11.6.14.2.2 Impacts on Lands Surrounding the Proposed Gold Point SEZ

Because of the large size of utility-scale solar energy facilities and the generally flat, open nature of the proposed SEZ, lands outside the SEZ would be subjected to visual impacts related to construction, operation, and decommissioning of utility-scale solar energy facilities. The affected areas and extent of impacts would depend on a number of visibility factors and viewer distance (for a detailed discussion of visibility and related factors, see Section 5.12). A key component in determining impact levels is the intervisibility between the project and potentially affected lands; if topography, vegetation, or structures screen the project from viewer locations, there is no impact.

Preliminary viewshed analyses were conducted to identify which lands surrounding the proposed SEZ would have views of solar facilities in at least some portion of the SEZ (see Appendix M for information on the assumptions and limitations of the methods used). Four viewshed analyses were conducted, assuming four different heights representative of project components 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]). Viewshed maps for the SEZ for all four solar technology heights are presented in Appendix N.

Figure 11.6.14.2-1 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

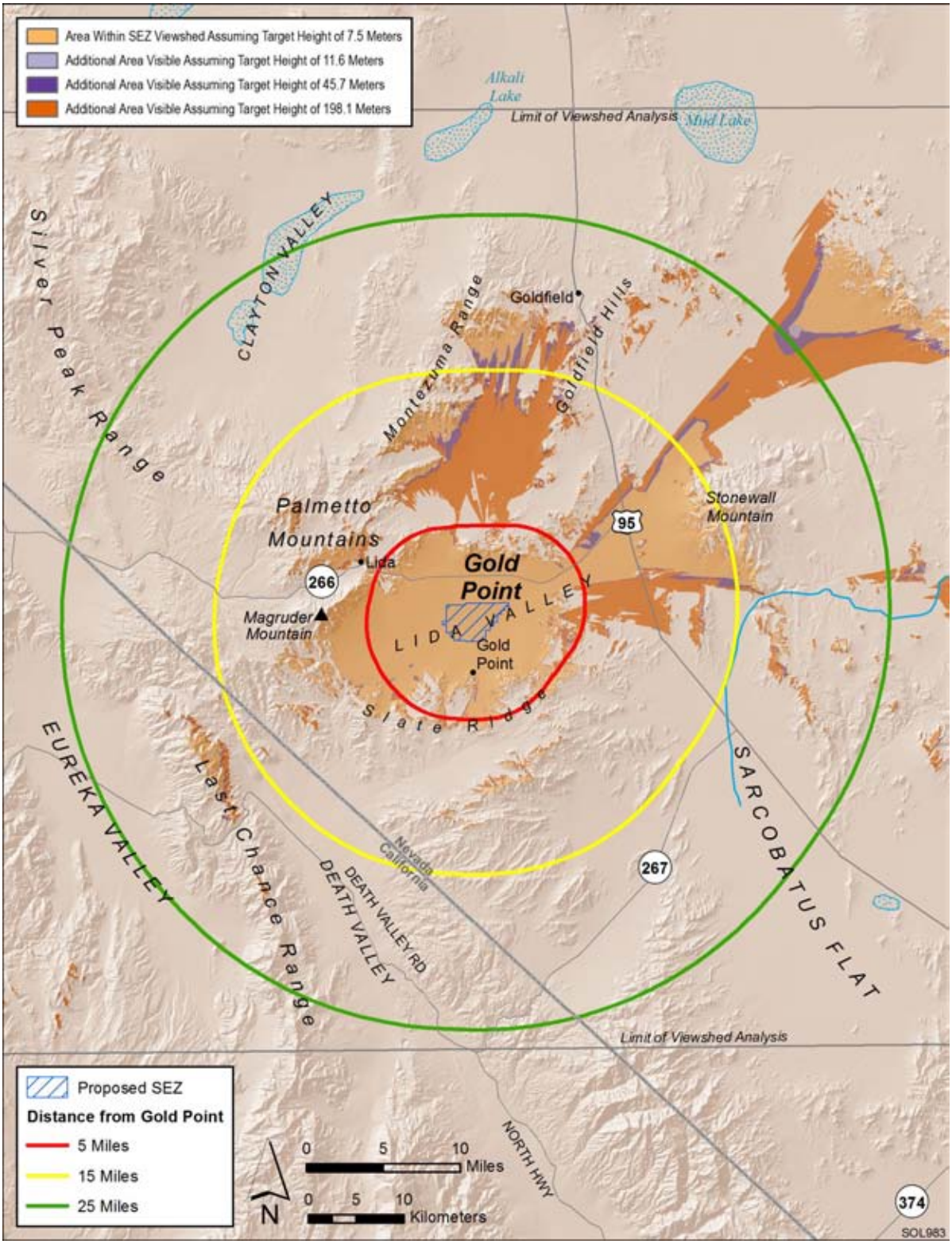

FIGURE 11.6.14.2-1 Viewshed Analyses for the Proposed Gold Point SEZ and Surrounding Lands, Assuming Solar Technology Heights of 24.6 ft (7.5 m), 38 ft (11.6 m), 150 ft (45.7 m), and 650 ft (198.1 m) (shaded areas indicate lands from which solar development within the SEZ could be visible)

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 could be visible from the additional areas shaded in medium brown.

For the following visual impact discussion, the tall solar power tower (650 ft [198.1 m]) and PV and parabolic trough array (24.6 ft [7.5 m]) viewsheds are shown in the figures and discussed in the text. These heights represent the maximum and minimum landscape visibility for solar energy technologies analyzed in this PEIS. Viewsheds for solar dish and CSP technology power blocks (38 ft [11.6 m]) and for transmission towers and short solar power towers (150 ft [45.7 m]) are presented in Appendix N. The visibility of these facilities would fall between that for tall power towers and PV and parabolic trough arrays.

Impacts on Selected Federal-, State-, and BLM-Designated Sensitive Visual Resource Areas

Figure 11.6.14.2-2 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 also are shown to indicate the effect of distance from the SEZ on impact levels, which are highly dependent on distance.

The scenic resources included in the analyses were as follows:

- National Parks, National Monuments, National Recreation Areas, National Preserves, National Wildlife Refuges, National Reserves, National Conservation Areas, National Historic Sites;
- Congressionally authorized Wilderness Areas;
- Wilderness Study Areas;
- National Wild and Scenic Rivers;
- Congressionally authorized Wild and Scenic Study Rivers;

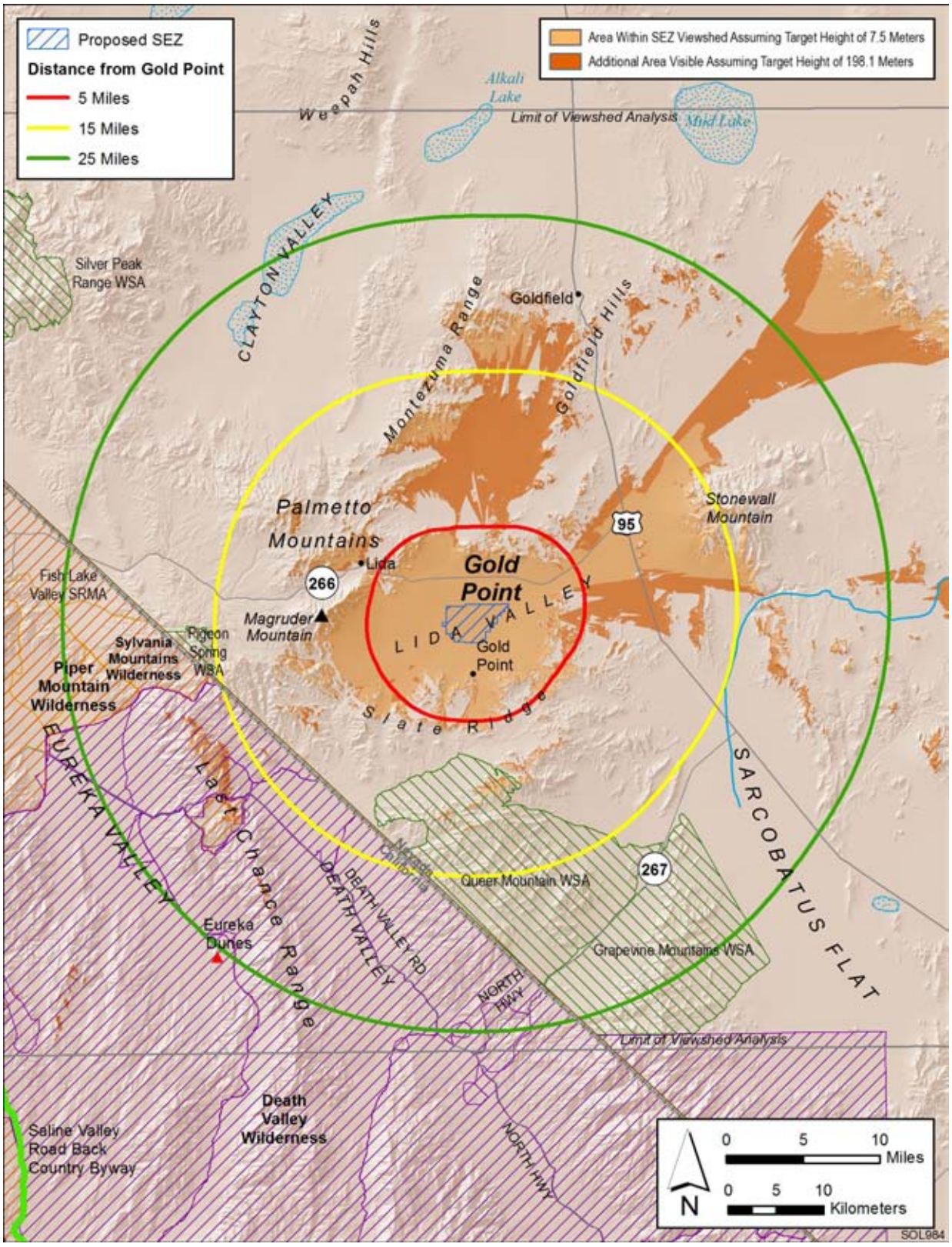

FIGURE 11.6.14.2-2 Overlay of Selected Sensitive Visual Resource Areas onto Combined 650-ft (198.1-m) and 24.6-ft (7.5-m) Viewsheds for the Proposed Gold Point SEZ

- 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.

Potential impacts on specific sensitive resource areas visible from and within 25 mi (40 km) of the proposed Gold Point SEZ are discussed below. The results of this analysis are also summarized in Table 11.6.14.2-1. Further discussion of impacts on these areas is presented in Sections 11.6.3 (Specially Designated Areas and Lands with Wilderness Characteristics) and Section 11.6.17 (Cultural Resources) of this PEIS.

TABLE 11.6.14.2-1 Selected Potentially Affected Sensitive Visual Resources within a 25-mi (40-km) Viewshed of the Proposed Gold Point SEZ, Assuming a Target Height of 650 ft (198.1 m)

		Feature Area[b]		
			Visible between	
Feature Type	Feature Name (Total Acreage)[a]	Visible within 5 mi	5 and 15 mi	15 and 25 mi
National Park	Death Valley (3,397,062 acres)	0 acres	67 acres (0.002%)	3,747 acres (0.1%)
National Conservation Area	California Desert (25,919,319 acres)	0 acres	67 acres (0.0003%)	4,198 acres (0.02%)
Was	Death Valley (3,074,256 acres)	0 acres	67 acres (0.002%)	3,707 acres (0.1%)
WSAs	Pigeon Spring (3,651 acres)	0 acres	0 acres	8 acres (0.2%)
	Queer Mountain (85,294 acres)	0 acres	1,276 acres (2%)	0 acres
SRMA	Fish Lake Valley (196,811 acres)	0 acres	0 acres	460 acres (0.2%)

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

[b] Percentage of total feature viewable.

The following visual impact analysis describes *visual contrast levels* rather than *visual impact levels*. *Visual contrasts* are changes in the landscape as seen by viewers, including changes in the forms, lines, colors, and textures of objects seen in the landscape. A measure of *visual impact* includes potential human reactions to the visual contrasts arising from a development activity, based on viewer characteristics, including attitudes and values, expectations, and other characteristics that that are viewer- and situation-specific. Accurate assessment of visual impacts requires knowledge of the potential types and numbers of viewers for a given development and their characteristics and expectations; specific locations where the project might be viewed from; and other variables that were not available or not feasible to incorporate in the PEIS analysis. These variables would be incorporated into a future site-and project-specific assessment that would be conducted for specific proposed utility-scale solar energy projects. For more discussion of visual contrasts and impacts, see Section 5.12 of the PEIS.

National Park

- *Death Valley.* Death Valley NP is located in California, about 13 mi (21 km) southwest of the SEZ at the point of closest approach. The vast Death Valley NP is a popular winter hiking area. The Death Valley NP contains paved roads popular for scenic driving and biking, several miles of hiking trails, and four-wheel drive roads. There are campgrounds, and backcountry camping is allowed. Death Valley NP has some of the darkest night skies in the country (NPS 2010), and they are considered an important part of the national park visitor experience. Stargazing is popular year round, as are bird watching and viewing spring wildflowers. Most of the park's services and facilities, as well as most recreational use, are in the central and northeastern portions of the park.

GOOGLE EARTH™ VISUALIZATIONS

The visual impact analysis discussion in this section utilizes three-dimensional Google Earth™ perspective visualizations of hypothetical solar facilities placed within the SEZ. The visualizations include simplified wireframe models of a hypothetical solar power tower facility. The models were placed at various locations within the SEZ as visual aids for assessing the approximate size and viewing angle of utility-scale solar facilities. The visualizations are intended to show the apparent size, distance, and configuration of the SEZ, as well as the apparent size of a typical utility-scale solar power tower project and its relationship to the surrounding landscape, as viewed from potentially sensitive visual resource areas within the viewshed of the SEZ.

The visualizations are not intended to be realistic simulations of the actual appearance of the landscape or of proposed utility-scale solar energy projects. The placement of models within the SEZ did not reflect any actual planned or proposed projects within the SEZ, and did not take into account engineering or other constraints that would affect the siting or choice of facilities for this particular SEZ. The number of facility models placed in the SEZ does not reflect the 80% development scenario analyzed in the PEIS, but it should be noted that the discussion of expected visual contrast levels does account for the 80% development scenario. A solar power tower was chosen for the models because the unique height characteristics of power tower facilities make their visual impact potential extend beyond other solar technology types.

Solar facilities within the SEZ could be visible from the summits and northeast-facing slopes of higher peaks of the Last Chance Range within the NP. Visibility of solar facilities within the SEZ would primarily be from the area surrounding Last Chance Mountain, at about 16 to 18 mi (23 to 26 km) from the SEZ. These areas include about 3,814 acres (15.4 km^2) in the 650-ft (198.1-m) viewshed, or 0.1% of the total NP acreage, and 2,213 acres (9.0 km^2) in the 24.6-ft (7.5-m) viewshed, or 0.07% of the total Death Valley NP acreage. Areas of Death Valley NP within the SEZ 25-mi (40 km) viewshed extend from 14 mi (23 km) to around 21 mi (34 km) from the southwestern boundary of the SEZ. Additional areas of the NP are within the SEZ viewshed beyond 30 mi (48 km) from the SEZ.

For about one-third of the area in the NP within the SEZ 25-mi (40-km) viewshed, visibility would be restricted to taller solar facility components, such as transmission towers and power towers. Furthermore, most of the area has scattered vegetation, and views of the SEZ could therefore be subject to screening. Three additional areas with visibility exist at distances from 14 to 21 mi (23 to 34 km) from the SEZ, but the largest of these areas is less than 200 acres (0.81 km^2) in size, and in these smaller areas, visibility would be limited to the upper portions of tall power towers in the SEZ.

In the area around Last Chance Mountain, some viewpoints would have clear views of the SEZ, but the SEZ would occupy only a very small part of the horizontal field of view, and the vertical viewing angle would be very low, despite the elevated viewpoints. Figure 11.6.14.2-3 is a Google Earth visualization of the SEZ as seen from near the summit of Last Chance Mountain in Death Valley NP, about 18 mi (29 km) from the southwest corner of the SEZ. The visualization includes simplified wireframe models of a hypothetical solar power tower facility. The models were placed within the SEZ as a visual aide for assessing the approximate size and viewing angle of utility-scale solar facilities.

The receiver towers depicted in the visualization are properly scaled models of a 459-ft (140-m) power tower with an 867-acre (3.5-km^2) field of 12-ft (3.7-m) heliostats, each representing about 100 MW of electric generating capacity. One group of two models was placed in the SEZ for this and other visualizations shown in this section of the PEIS. In the visualization, the SEZ area is depicted in orange, the heliostat fields in blue.

The viewpoint in the visualization is about 3,500 ft (1,070 m) higher in elevation than the SEZ. The visualization suggests that from this elevated viewpoint, the tops of collector arrays within the SEZ would likely be visible, but the angle of view would be low because of the 18-mi (29-km) distance to the SEZ. The SEZ and solar facilities within it would occupy a very small portion of the horizontal field of view.

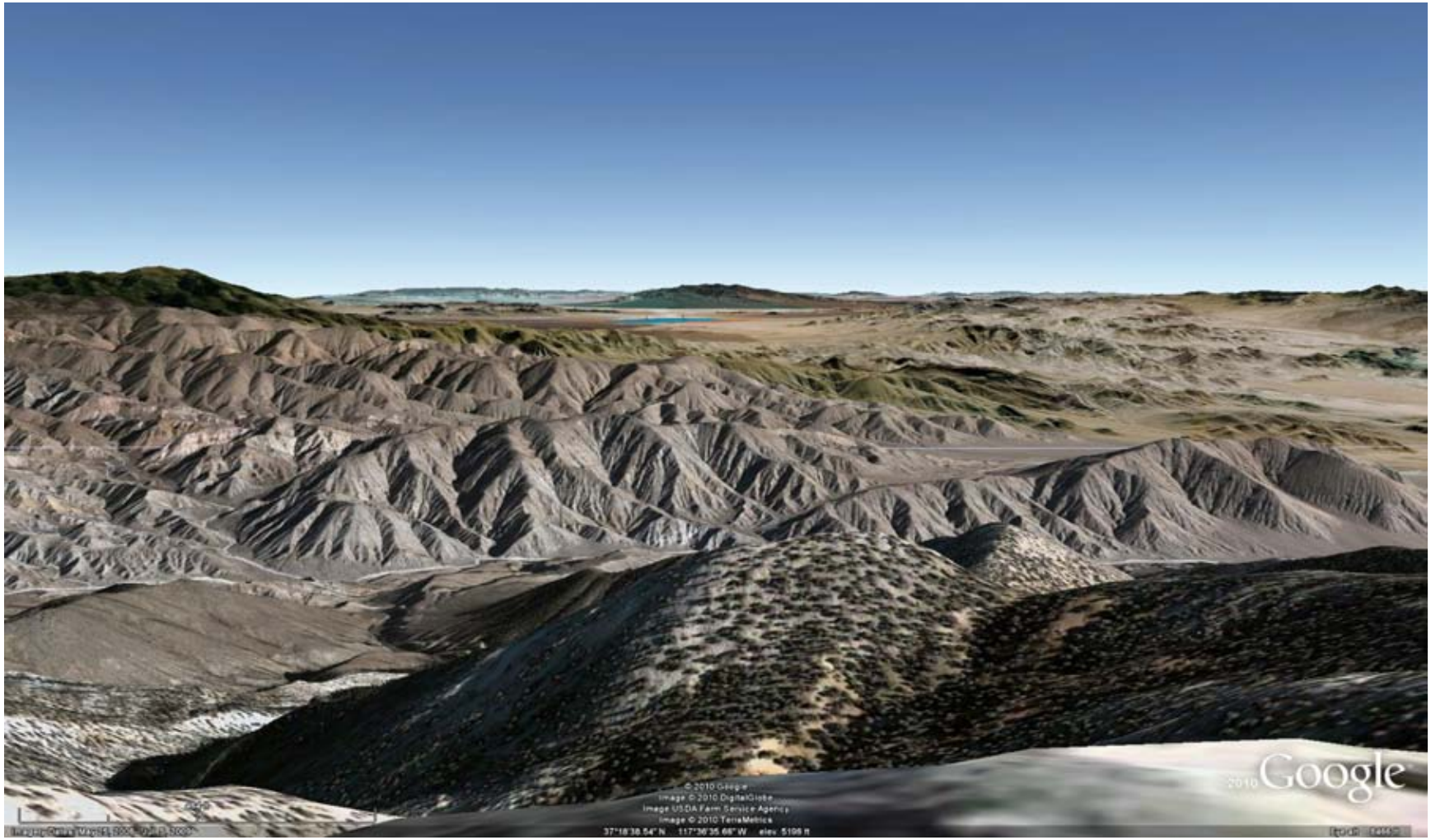

FIGURE 11.6.14.2-3 Google Earth Visualization of the Proposed Gold Point SEZ (shown in orange tint) and Surrounding Lands, with Power Tower Wireframe Model, as Seen from Last Chance Mountain in Death Valley NP (also California Desert Conservation Area and Death Valley WA)

If power towers were present within the SEZ, they would be visible as points of light against a backdrop of the valley floor. At night, if more than 200 ft (61 m) tall, power towers would have hazard navigation lights that could potentially be visible from this location. The lights could be red flashing lights or red or white strobe lights, and the light could be visible from this viewpoint, and could attract visual attention, especially given the dark night skies typical in the remote location of the SEZ. Depending on project location within the SEZ, the types of solar facilities and their designs, and other visibility factors, weak visual contrasts from solar energy development within the SEZ could be expected at this location.

The summit of Last Chance Mountain is the highest-elevation viewpoint in Death Valley NP within the 25-mi (40-km) viewshed of the SEZ. Other viewpoints in the NP that are within the 25-mi (40 km) SEZ viewshed are at about the same distance from the SEZ, but would be lower in elevation and would therefore be subject to similar or slightly lower contrast levels from solar development within the SEZ, particularly given that in some of the areas, visibility would be limited to taller solar facilities, thereby reducing impact. In general, visual contrast levels arising from solar facilities within the SEZ would not be expected to exceed weak levels for viewpoints within Death Valley NP.

National Conservation Area

- *California Desert.* The California Desert Conservation Area (CDCA) is a 26-million-acre (105,000-km^2) parcel of land in southern California designated by Congress in 1976 through the Federal Land Policy and Management Act. About 10 million acres (40,000 km^2) of the CDCA is administered by the BLM.

  The CDCA management plan (BLM 1999) notes the "superb" variety of scenic values in the CDCA and lists scenic resources as needing management to preserve their value for future generations. The CDCA management plan divides CDCA lands into multiple-use classes based on management objectives. The class designations govern the type and degree of land use actions allowed within the areas defined by class boundaries. All land use actions and resource-management activities on public lands within a multiple-use class delineation must meet the guidelines given for that class.

  CDCA land within the viewshed of the Gold Point SEZ is within Death Valley NP. Portions of the CDCA within the 650-ft (198.1-m) viewshed for the Gold Point SEZ include about 4,265 acres (17.3 km^2), or 0.02% of the total CDCA acreage. Portions of the CDCA within the 24.6-ft (7.5-m) viewshed encompass about 2,221 acres (9.0 km^2), or 0.009% of the total CDCA acreage. Areas of the CDCA within the SEZ 25-mi (40 km) viewshed

extend from 14 mi (23 km) to around 21 mi (34 km) from the southwestern boundary of the SEZ. Additional areas of the CDCA are within the SEZ viewshed beyond 30 mi (48 km) from the SEZ.

Death Valley NP is located entirely within the CDCA, and the portions of the CDCA within the 25-mi (40-km) viewshed of the SEZ are identical to those within the NP. Expected visual contrast levels for the CDCA are the same as those expected for the NP, as described above.

Wilderness Area

- *Death Valley.* Death Valley WA is a 3,074,256-acre (12,441-km^2) congressionally designated WA located 13 mi (21 km) southwest of the SEZ. It is the largest area of designated National Park wilderness within the contiguous United States (NPS 2010). Within 25 mi (40 km) of the SEZ, solar energy facilities within the SEZ could be visible from portions of the WA (about 3,774 acres [15.3 km^2], or 0.1% of the total WA acreage, in the 650-ft [198.1-m] viewshed, and 2,210 acres [8.9 km^2], or 0.1% of the total WA acreage, in the 25-ft [7.5-m] viewshed). The visible area of the Death Valley NP extends from 14 mi (23 km) to beyond 25 mi (40 km) from the southwestern boundary of the SEZ.

  Death Valley WA is located entirely within Death Valley NP, and the portions of the WA within the 25-mi (40 km) viewshed of the SEZ are identical to those within the NP. Expected visual contrast levels for the WA are the same as those expected for the NP, as described above.

Wilderness Study Areas

- *Pigeon Spring.* Pigeon Spring Wilderness Study Area (WSA) is a 3,651-acre (14.8-km^2) WSA located 15 mi (24 km) west of the SEZ. Within 25 mi (40 km) of the SEZ, solar energy facilities within the SEZ could be visible from about 8 acres (0.03 km^2), or 0.2% of the total WSA acreage, in the 650-ft (198.1-m) viewshed. None of the WSA is visible within the 25-ft (7.5-m) viewshed. The visible area of the WSA is about 16 mi (26 km) from the western boundary of the SEZ.

  The receivers and upper portions of sufficiently tall power towers placed in the far southern portion of the SEZ could potentially be visible from a very small portion of the WSA. This portion of the WSA is wooded, and trees would likely partially or completely block the view of solar facilities within the SEZ. If operating power towers were visible in this portion of the SEZ, they would be visible as points of light just above the intervening mountains. At night, if more than 200 ft (61 m) tall, power towers would have hazard

navigation lights that could potentially be visible from this location. The lights could be red flashing lights or red or white strobe lights, and the light could potentially be visible from the WSA. Expected visual impacts on the WSA would be minimal.

- *Queer Mountain.* Queer Mountain WSA is an 85,294-acre (345.2-km^2) wilderness study area located 7.0 mi (11.3 km) south of the SEZ. Within 25 mi (40 km) of the SEZ, solar energy facilities within the SEZ could be visible from local summits and north-facing slopes of Gold Mountain and some ridges west of Gold Mountain. Portions of the WSA within the SEZ 25-mi (40 km) viewshed include about 1,276 acres (5.2 km^2), or 2% of the total WSA acreage, in the 650-ft (198.1-m) viewshed and 522 acres (2.1 km^2), or 1% of the total WSA acreage, in the 25-ft (7.5-m) viewshed. The visible area of the WSA is about 8.7 to 12 mi (14 to 19 km) from the southern boundary of the SEZ.

  From the highest peaks and ridges in those portions of the WSA that have views of the SEZ, the ridges of Slate Ridge generally screen at least some of the SEZ from view; however, from some viewpoints, most of the SEZ would be visible, and the SEZ would occupy a moderate amount of the horizontal field of view. Although the vertical angle of view is low, it is high enough that the tops of collector/reflector arrays within the SEZ would likely be visible. From these very high-elevation viewpoints, visual contrast levels from solar facilities could potentially reach moderate levels, but for lower elevation viewpoints, weak levels of visual contrast would be expected.

  Figure 11.6.14.2-4 is a Google Earth visualization of the SEZ as seen from the summit of Gold Mountain in the WSA, about 10 mi (16 km) directly south of the SEZ. The viewpoint in the visualization is about 3,000 ft (900 m) higher in elevation than the SEZ. Solar facilities within the SEZ would be seen in a band just above the top of Slate Ridge.

  The visualization suggests that from this elevated viewpoint, the tops of collector/reflector arrays within the SEZ would likely be visible, which would increase the apparent size of the collector/reflector arrays and would make the strong regular geometry of the arrays more apparent. The SEZ and solar facilities within it would occupy a moderate portion of the horizontal field of view. If power towers were present within the SEZ, the receivers could be visible as bright points of light against a backdrop of the valley floor. They would be likely to attract visual attention and likely could not be missed by casual viewers. At night, sufficiently tall power towers could have red or white flashing hazard lights that would be visible from Gold Mountain, and they would likely attract attention given the dark night skies typical of the area. Other lighting associated with solar facilities in the SEZ could be visible as well. Depending on project location within the SEZ, the types of solar facilities and their designs, and other visibility factors, moderate visual

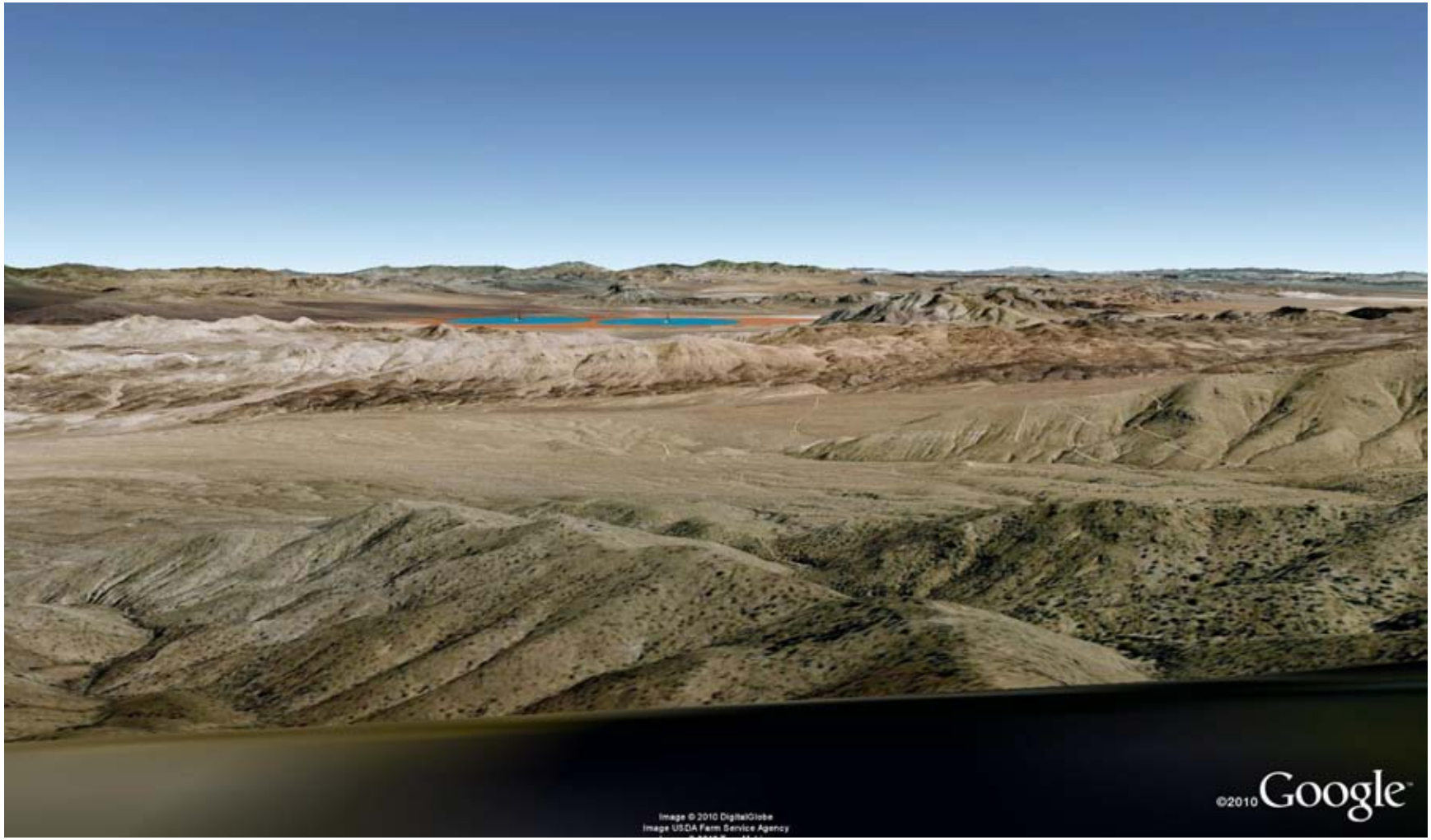

FIGURE 11.6.14.2-4 Google Earth Visualization of the Proposed Gold Point SEZ (shown in orange tint) and Surrounding Lands, with Power Tower Wireframe Model, as Seen from Gold Mountain in Queer Mountain WSA

contrasts from solar energy development within the SEZ could be expected at this location.

The summit of Gold Mountain is the highest-elevation viewpoint in the WSA within the 25-mi (40-km) viewshed of the SEZ. Other viewpoints in the WSA that are within the 25-mi (40 km) SEZ viewshed are at about the same distance or slightly less distant from the SEZ, but would be lower in elevation. These viewpoints would therefore be subject to similar or lower contrast levels from solar development within the SEZ, particularly given that in some of the areas, visibility would be limited to taller solar facilities, thereby reducing impact. In general, moderate levels of visual contrast would be expected for some high-elevation viewpoints in the WSA, with weaker contrasts expected for lower elevation viewpoints in the WSA.

Special Recreation Management Area

- *Fish Lake Valley*—The Fish Lake Valley SRMA is a BLM-designated SRMA located in California that contains two separate areas. The portion of the SRMA that is within the viewshed of Gold Point SEZ is located 17 mi (28 km) southwest of the SEZ at the point of closest approach. The total acreage of the SRMA is 196,811 acres (796.5 km^2).

  The area of the SRMA within the 650-ft (198.1-m) viewshed of the SEZ includes 460 acres (1.9 km^2), or 0.2% of the total SRMA acreage. The area of the SRMA within the 24.6-ft (7.5-m) viewshed of the SEZ includes 12 acres (0.05 km^2), or 0.006% of the total SRMA acreage. The visible area extends from 16 mi (26 km) from the southwestern boundary of the SEZ to 19 mi (31 km) into the SRMA.

  As shown in Figure 11.6.14.2-2, visibility of solar facilities within the SEZ would be limited to a very small area of the SRMA, and visibility of low height facilities, such as PV panels or trough arrays, would be limited to 12 acres (0.05 km^2) within the SRMA. Areas within the 25-mi (40-km) viewshed of the SEZ include the summits and northeast-facing slopes of peaks in the Last Chance Range in the SRMA. Views of the SEZ from the SRMA are nearly completely screened by mountains and ridges between the SRMA and the SEZ, including Slate Ridge. Because of the very limited visibility of the SEZ and the long distance to the SEZ (17 mi [28 km]), under the 80% development scenario analyzed in the PEIS, expected visual contrast levels would be minimal for viewpoints within the SRMA.

Additional scenic resources exist at the national, state, and local levels, and impacts may occur on both federal and nonfederal lands, including sensitive traditional cultural properties important to Tribes. In addition to the resource types and specific resources analyzed in this PEIS, future site-specific NEPA analyses would include state and local parks, recreation areas, other sensitive visual resources, and communities close enough to the proposed project to be

affected by visual impacts. Selected other lands and resources are included in the discussion below.

In addition to impacts associated with the solar energy facilities themselves, sensitive visual resources could be affected by other facilities that would be built and operated in conjunction with the solar facilities. With respect to visual impacts, the most important associated facilities would be access roads and transmission lines, the precise location of which cannot be determined until a specific solar energy project is proposed. The nearest large transmission line is 22 mi (35 km) from the SEZ, and the construction of new transmission facilities would be required both within and outside the SEZ. Depending on their location and visibility, these new facilities could potentially cause large additional visual impacts to the sensitive visual resource areas and sensitive viewing areas listed above, as well as other areas not listed above.

Impacts on Selected Other Lands and Resources

Magruder Mountain. Magruder Mountain (elevation 9,044 ft [2,756 m]), located 5 to 10 mi (8 to 16 km) west of the SEZ, is sacred to the Timbisha Shoshone. The summit of the mountain is about 4,000 ft (1,200 m) higher in elevation than the SEZ, and where vegetation and intervening terrain do not provide screening, there are commanding views of the SEZ.

Figure 11.6.14.2-5 is a Google Earth visualization of the SEZ as seen from the main peak of Magruder Mountain, about 8 mi (13 km) due west of the SEZ, facing east. The visualization suggests that from this elevated viewpoint, solar facilities within the SEZ would be in full view. The tops of solar facilities within the SEZ would be visible, which would reveal their size and the strong regular geometry of the solar collector/reflector arrays. These views would tend to increase visual contrasts with the natural appearing surroundings. In general, the SEZ would occupy only a small portion of the horizontal field of view, but for some viewpoints on the northeastern portion of Magruder Mountain, the SEZ is close enough that it would occupy a moderate amount of the horizontal field of view.

The receivers of operating power towers within the SEZ would be visible and would likely appear as bright point or non-point (i.e., having a visible cylindrical or rectangular surface) light sources atop discernable tower structures. The lights would likely attract visual attention. At night, sufficiently tall power towers could have red or white flashing hazard lights that would be visible from Magruder Mountain. These lights would likely attract attention, given the dark night skies typical of the area. Other lighting associated with solar facilities in the SEZ could be visible as well.

Under the 80% development scenario analyzed in the PEIS, depending on the type, number, sizes, and layouts of solar facilities within the SEZ, moderate visual contrasts would be expected for this viewpoint. In general, higher contrast levels of contrast would be expected for viewpoints on the eastern portions of the mountain, as they would be somewhat closer to the SEZ, and lower contrast levels would be expected for viewpoints farther west on the mountain.

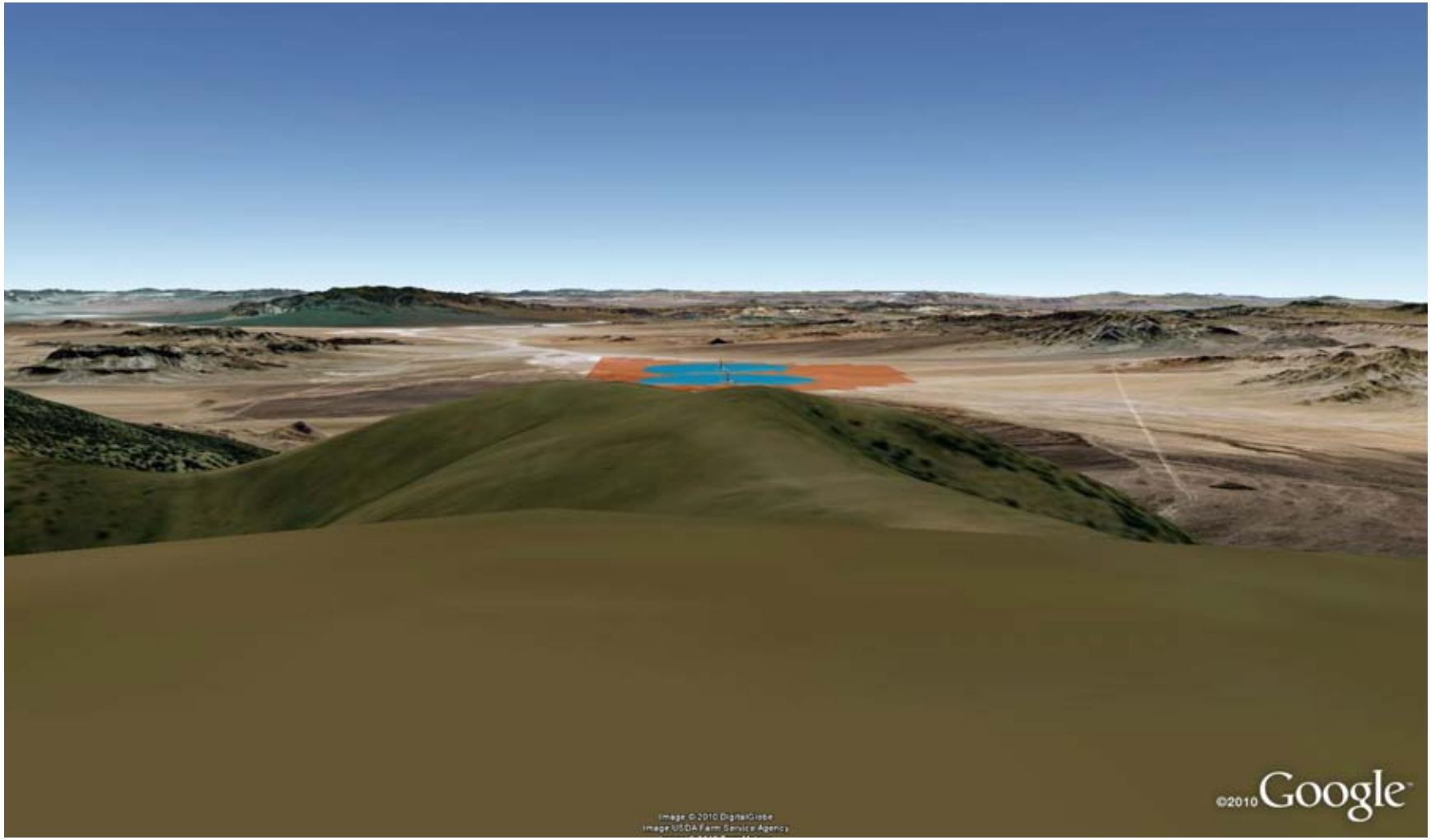

FIGURE 11.6.14.2-5 Google Earth Visualization of the Proposed Gold Point SEZ (shown in orange tint) and Surrounding Lands, with Power Tower Wireframe Model, as Seen from Magruder Mountain West of the SEZ

Lower visual contrast levels would also be expected at lower-elevation viewpoints on the mountain, both because the vertical angle of view to the SEZ would be lower (tending to reduce visual contrast levels) and because in many areas the lower slopes of the mountain are vegetated, and some screening of the SEZ by vegetation would be expected. Overall, under the 80% development scenario analyzed in the PEIS, moderate visual contrast levels would be expected for viewpoints on Magruder Mountain.

U.S. Highway 95. About 10 mi (16 km) of U.S. 95 are within the SEZ viewshed at a distance of 9 to 10.5 mi (14.5 to 16.9 km). The AADT value for U.S. 95 in the vicinity of the SEZ was about 1,900 in 2009 (NV DOT 2010).

Solar facilities would be viewed perpendicular to the direction of travel in both directions, along the narrow axis of both the SEZ and the narrow Lida Valley. For northbound travelers on U.S. 95, solar facilities within the SEZ could first come into view just north of Stonewall Pass. For about 4 mi (7 km) (about 3½ minutes at highway speeds), only the upper portions of sufficiently tall power towers could be seen. However, just after crossing the Esmeralda-Nye county line, low-height solar facilities within the SEZ could come into view, depending on their location within the SEZ. Low-height facilities would remain in view for about 5 mi (8 km) (about 4 minutes at highway speeds), after which taller solar facilities might be visible for about 1 more mile (1.6 km).

For those portions of U.S. 95 within the viewshed of the SEZ, the elevation of the roadway is 200 to 300 ft (60 to 90 m) lower than the SEZ, hence the vertical angle of view to the SEZ is extremely low. The SEZ would occupy a small portion of the horizontal field of view. While the receivers of operating power towers within the SEZ could appear as bright points of light at a distance of 10 mi (16 km), in general, because of the small apparent size of the SEZ and the very low angle of view, under the 80% development scenario analyzed in the PEIS, visual contrast levels from solar facilities within the SEZ would not be expected to exceed weak levels for travelers on U.S. 95.

Southbound travelers on U.S. 95 would have a generally similar visual experience, but the order would be reversed; that is, solar facilities within the SEZ would first come into view about 6 mi (10 km) north of the county line, and disappear from view shortly before travelers reached Stonewall Pass. Visual contrast levels would be similar to those observed by northbound travelers.

State Route 266. As shown in Figure 11.6.14.2-2, within 25 mi (40 km) of the SEZ, about 18 mi (29 km) of State Route 266 are within the SEZ viewshed at distances from 2 to 9.5 mi (3.2 to 15.3 km). The AADT value for State Route 266 in the vicinity of the SEZ was about 210 vehicles in 2009 (NV DOT 2010).

From both directions, the road first directly approaches the SEZ but then parallels the SEZ's northern boundary at a distance of about 2 mi (3 km). For westbound travelers on State Route 266, solar facilities within the SEZ could be in view at the junction of State Route 266

with U.S. 95, about 10 mi (16 km) northeast of the SEZ's northeast corner. The elevation of the roadway is lower than the SEZ but would gradually increase to that of the SEZ as travelers approached the SEZ. Regardless of elevation, the angle of view would be very low, causing the collector/reflector arrays of solar facilities within the SEZ to be viewed on edge, causing them to appear as thin lines at the western horizon. The edge-on view would conceal much of the arrays' strong regular geometry, reduce their apparent size, and cause them to appear to repeat the strong line of the horizon, all of which would tend to reduce their visual contrast. However, taller ancillary facilities, such as cooling towers, buildings, transmission components, and plumes (if present), would likely be visible above the collector/reflector arrays. These elements could add noticeable form, line, and color contrasts, which would increase as travelers approached the SEZ. The receivers of operating power towers within the SEZ would likely appear as bright or very bright light sources against the backdrop of Slate Ridge west of the SEZ. At night, sufficiently tall power towers could have red or white flashing hazard lighting that would be visible for many miles and would likely be visually conspicuous in the dark sky conditions of this remote location. Other lighting associated with solar facilities within eth SEZ could be visible and would add increasing visual contrast as travelers approached the SEZ. In general, as travelers approached the SEZ, expected visual contrast levels from solar facilities within the SEZ would rise from weak to strong levels. The approach to the SEZ is a little more than 9 mi (15 km), and would take about 8 minutes at highway speeds.

By the time westbound travelers reached that part of State Route 266 north of the SEZ, visual contrast levels from solar facilities within the SEZ under the 80% development scenario would likely have risen to strong levels. Figure 11.6.14.2-6 is a Google Earth perspective visualization of the SEZ as seen from State Route 266 about 1.7 mi (2.8 km) north of the SEZ, facing south toward two power tower models 2.8 mi (4.5 km) south of the viewpoint. The visualization suggests that from this location, solar facilities would be in full view, and the SEZ would occupy nearly the entire horizontal field of view. Solar facilities located within the closest portions of the SEZ would strongly attract visual attention and would likely dominate the view toward the south. The viewpoint from the road is about 60 ft (20 m) higher in elevation than the nearest part of the SEZ, so solar collector arrays would be seen nearly edge-on and would repeat the horizontal line of the plain in which the SEZ is situated. This would tend to reduce visual line contrast somewhat. Ancillary facilities, such as buildings, transmission towers, cooling towers and plumes (if present), would likely be visible projecting above the collector/reflector arrays. Their forms, lines, colors, and reflective properties could contrast strongly with the horizontal collector/reflector arrays and surrounding mostly natural-appearing landscape.

The receivers of operating power towers within the SEZ would likely appear as brilliant white non-point light sources atop towers whose structural details could be visible. At night, sufficiently tall power towers would have red or white flashing lights that would likely strongly attract visual attention in the dark night sky typical of the area.

Under the 80% development scenario analyzed in this PEIS, solar facilities within the SEZ to the south would likely dominate views on State Route 266 within a few miles of the SEZ, and would be expected to cause strong levels of visual contrast. Moderate to weak levels of visual contrasts would be expected for viewpoints on State Route 266 farther from the SEZ.

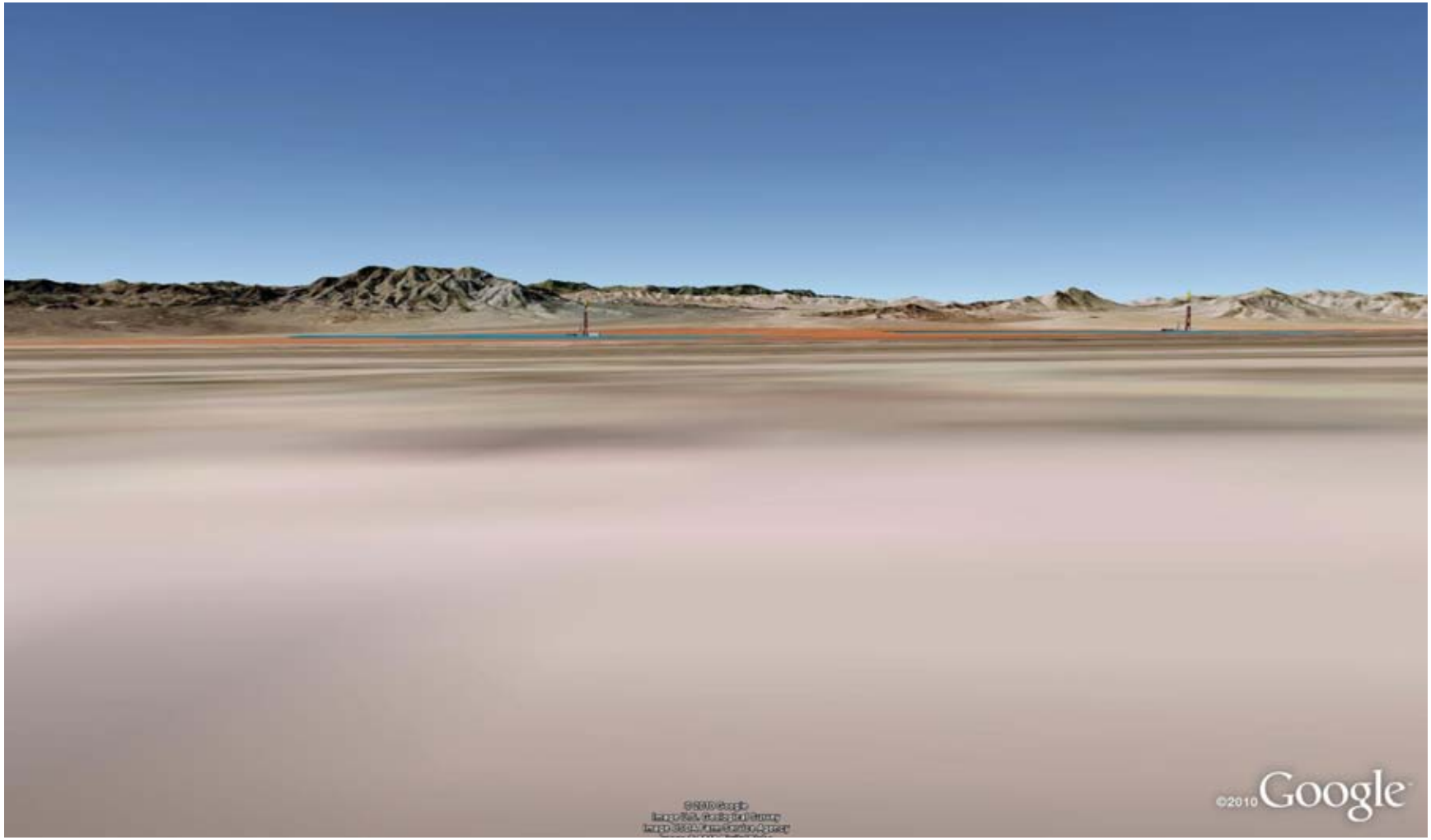

FIGURE 11.6.14.2-6 Google Earth Visualization of the Proposed Gold Point SEZ (shown in orange tint) and Surrounding Lands, with Power Tower Wireframe Model, as Seen from State Route 266 Directly North of the SEZ

Eastbound travelers on State Route 266 would experience the same visual contrast levels as westbound travelers, but because the eastbound travelers would enter the viewshed after leaving Lida Canyon much closer to the SEZ (about 4 mi [6 km]) than westbound travelers, contrast levels from solar facilities within the SEZ would reach strong levels much faster than for westbound travelers. The total time solar facilities would be in view in the general direction of travel would also be shorter, as eastbound travelers would approach and pass the SEZ more quickly than westbound travelers.

Community of Gold Point. As shown in Figure 11.6.14.2-1, the community of Gold Point is less than 2 mi (3.2 km) directly south of the SEZ. Because of the proximity of the SEZ and the slightly elevated viewpoints within Gold Point, solar facilities within the SEZ would be expected to dominate views to the north from Gold Point, creating strong visual contrasts. A site visit in August 2009 indicated largely open views of the proposed SEZ from Gold Point. However, from some viewpoints in the community, at least partial screening of solar facilities within the SEZ would occur, due to slight variations in topography or structures. A detailed future site-specific NEPA analysis would be required to determine visibility precisely.

From the community of Gold Point, the SEZ would occupy nearly the entire horizontal field of view looking north, because views from Gold Point toward the SEZ would be perpendicular to the long axis of the SEZ and also because of the relatively short distance to the SEZ. The elevation of Gold Point is about 400 ft (120 m) higher than the SEZ, so although the vertical angle of view would be low, the tops of collector/reflector arrays of solar facilities within the SEZ would likely be visible, tending to increase their contrasts with the surrounding natural-appearing landscape. The structural details of facility components could be visible, with taller solar facility components and plumes projecting above the collector/reflector arrays. Depending on their location within the SEZ, operating power tower receivers in the closest portions of the SEZ would likely be seen as brilliant white non-point light sources against either the backdrop of the Lida Valley floor or the Mt. Jackson Ridge north of the SEZ. Also, under certain viewing conditions, sunlight on dust particles in the air might result in the appearance of light streaming down from the tower(s). At night, if more than 200 ft (61 m) tall, power towers would have hazard navigation lights that could potentially be visible from this location. The lights could be red flashing lights or red or white strobe lights, and the lights would likely be very conspicuous from Gold Point, given the dark night skies found in the area. Other lighting associated with solar facilities would likely be visible as well. Under the 80% development scenario analyzed in this PEIS, strong levels of visual contrast would be expected to result from solar energy development within the SEZ, as seen from unscreened viewpoints within the community of Gold Point.

Other Impacts. In addition to the impacts described for the resource areas above, nearby residents and visitors to the area may experience visual impacts from solar energy facilities located within the SEZ (as well as any associated access roads and transmission lines) from their residences, or as they travel area roads. The range of impacts experienced would be highly dependent on viewer location, project types, locations, sizes, and layouts, as well as the presence of screening, but under the 80% development scenario analyzed in the PEIS, from some locations, strong visual contrasts from solar development within the SEZ could potentially be observed.

11.6.14.2.3 Summary of Visual Resource Impacts for the Proposed Gold Point SEZ

Under the 80% development scenario analyzed in the PEIS, the SEZ would contain multiple solar facilities utilizing differing solar technologies, as well as a variety of roads and ancillary facilities. The array of facilities could create a visually complex landscape that would contrast strongly with the strongly horizontal landscape of the flat valley in which the SEZ is located. Large visual impacts on the SEZ and surrounding lands within the SEZ viewshed would be associated with solar energy development within the proposed Gold Point SEZ because of major modification of the character of the existing landscape. Potential exists for additional impacts from construction and operation of transmission lines and access roads within and outside the SEZ.

Under the 80% development scenario analyzed in the PEIS, utility-scale solar energy development within the proposed Gold Point SEZ is likely to result in moderate visual contrasts for some viewpoints within the Queer Mountain WSA, which is within 7 mi (11 km) of the SEZ at the point of closest approach. Moderate visual contrast levels would also be expected for viewpoints on Macgruder Mountain. Minimal to weak visual contrasts would be expected for some viewpoints within other sensitive visual resource areas within the SEZ 25-mi (40-km) viewshed.

Residents of the community of Gold Point would likely experience strong visual contrasts from solar energy development within the SEZ. About 18 mi (29 km) of State Route 266 are within the SEZ viewshed at distances of 2 to 9.5 mi (3.2 to 15.3 km) from the SEZ. Travelers on State Route 266 could be subjected to strong visual contrasts from solar energy development within the SEZ. Visitors to the area, workers, and residents of the community of Gold Point may experience visual impacts from solar energy facilities located within the SEZ (as well as any associated access roads and transmission lines) as they travel other area roads.

11.6.14.3 SEZ-Specific Design Features and Design Feature Effectiveness

No SEZ-specific design features have been identified to protect visual resources for the proposed Gold Point SEZ. As noted in Section 5.12, the presence and operation of large-scale solar energy facilities and equipment would introduce major visual changes into non-industrialized landscapes and could create strong visual contrasts in line, form, color, and texture that could not easily be mitigated substantially. Implementation of programmatic design features intended to reduce visual impacts (described in Appendix A, Section A.2.2) would be expected to reduce visual impacts associated with utility-scale solar energy development within the SEZ; however, the degree of effectiveness of these design features could be assessed only at the site- and project-specific level. Given the large scale, reflective surfaces, 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 is the primary means of mitigating visual impacts. The effectiveness of other visual impact mitigation measures would generally be limited.

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11.6.15 Acoustic Environment

11.6.15.1 Affected Environment

The proposed Gold Point SEZ is located in the southern portion of Esmeralda County in southwestern Nevada. Neither the State of Nevada nor Esmeralda County has established quantitative noise-limit regulations applicable to solar energy development.

The proposed Gold Point SEZ is in an undeveloped area, the overall character of which is rural. U.S. 95 runs north–south as close as 9 mi (14 km) east of the SEZ. State Route 266 runs east–west less than 2 mi (3 km) north of the SEZ, while State Route 774 runs along the SEZ's eastern boundary as close as 0.25 mi (0.4 km). Lida Road runs along the SEZ's western boundary as close as 300 ft (91 m). Several dirt roads run through the SEZ. No railroad line exists around the SEZ. The nearest airport is Lida Junction Airport, which is located about 9 mi (14.5 km) east-northeast of the SEZ. Other nearby airport includes Goldfield Airport, about 21 mi (34 km) north-northeast of the SEZ. There are no agricultural activities in and around the SEZ, but cattle grazing seems to occur within the SEZ. No industrial activities other than small-scale mining are located around the SEZ. No significant recreational land use exists within the SEZ. No sensitive receptors (e.g., residences, hospitals, schools, or nursing homes) exist close to the proposed Gold Point SEZ. The nearest residences (squatters) lie about 2 mi (3 km) south of the SEZ near Gold Point, which is a well-preserved ghost town and point of interest for many tourists. Noise sources around the SEZ include road traffic, aircraft flyover, cattle grazing, and road traffic related to tourism around Gold Point. To date, no environmental noise survey has been conducted around the proposed Gold Point SEZ. On the basis of the population density, the day–night average noise level (L_{dn} or DNL) is estimated to be 17 dBA for Esmeralda County, well below the 33 to 47 dBA L_{dn} range level typical of a rural area (Eldred 1982; Miller 2002).[9]

11.6.15.2 Impacts

Potential noise impacts associated with solar projects in the Gold Point SEZ would occur during all phases of the projects. During the construction phase, potential noise impacts associated with operation of heavy equipment and vehicular traffic on the nearest residences (about 2 mi [3 km] to the south of the SEZ boundary) would be anticipated, albeit of short duration. During the operations phase, potential impacts on the nearest residences would be anticipated, depending on the solar technologies employed. Noise impacts shared by all solar technologies are discussed in detail in Section 5.13.1, and technology-specific impacts are presented in Section 5.13.2. Impacts specific to the proposed Gold Point SEZ are presented in this section. Any such impacts would be minimized through the implementation of required programmatic design features described in Appendix A, Section A.2.2, and through the applications of any additional SEZ-specific design features (see Section 11.6.15.3 below). This

[9] Rural and undeveloped areas have sound levels in the range of 33 to 47 dBA as L_{dn} (Eldred 1982). Typically, the nighttime level is 10 dBA lower than daytime level, and it can be interpreted as 33 to 47 dBA (mean 40 dBA) during the daytime hours and 23 to 37 dBA (mean 30 dBA) during nighttime hours.

section primarily addresses potential noise impacts on humans, although potential impacts on wildlife at nearby sensitive areas are discussed. Additional discussion on potential noise impacts on wildlife is presented in Section 5.10.2.

11.6.15.2.1 Construction

The proposed Gold Point SEZ has a relatively flat terrain; thus, minimal site preparation activities would be required, and associated noise levels would be lower than those during general construction (e.g., erecting building structures and installing equipment, piping, and electrical).

For the parabolic trough and power tower technologies, the highest construction noise levels would occur at the power block area, where key components (e.g., steam turbine/generator) needed to generate electricity are located; a maximum of 95 dBA at a distance of 50 ft (15 m) is assumed, if impact equipment such as pile drivers or rock drills is not being used. Typically, the power block area is located in the center of the solar facility, at a distance of more than 0.5 mi (0.8 km) from the facility boundary. Noise levels from construction of the solar array would be lower than 95 dBA. When geometric spreading and ground effects are considered, as explained in Section 4.13.1, noise levels would attenuate to about 40 dBA at a distance of 1.2 mi (1.9 km) from the power block area. This noise level is typical of daytime mean rural background levels. In addition, mid- and high-frequency noise from construction activities is significantly attenuated by atmospheric absorption under the low-humidity conditions typical of an arid desert environment, and by temperature lapse conditions typical of daytime hours; thus, noise attenuation to a 40-dBA level would occur at distances somewhat shorter than 1.2 mi (1.9 km). If a 10-hour daytime work schedule is considered, the EPA guideline level of 55 dBA L_{dn} for residential areas (EPA 1974) would occur about 1,200 ft (370 m) from the power block area, which would be well within the facility boundary. For construction activities occurring near the residences closest to the southern SEZ boundary, estimated noise levels at the nearest residences would be about 34 dBA[10], which is lower than the typical daytime mean rural background level of 40 dBA. In addition, an estimated 40 dBA L_{dn}[11] at these residences (i.e., no contribution from construction activities) is well below the EPA guidance of 55 dBA L_{dn} for residential areas.

[10] Due to the large difference in elevations between potential noise sources within the SEZ (about 4,960 ft [1,512 m) and receptors near Gold Point (5,400 ft [1,646 m]) located to the south, sound attenuation due to ground effects would likely be smaller as the source location moves north because the line-of-sight between them is higher above the ground. Without considering this effect, noise levels could be underestimated if the source location is located in the northern portion of the SEZ. It is possible that as a receptor moves farther north, the noise level would increase, depending on meteorological conditions. Accordingly, this elevation difference should be taken into account in refined noise calculations during the permitting process.

[11] For this analysis, background levels of 40 and 30 dBA for daytime and nighttime hours, respectively, are assumed, which result in a day–night average noise level (L_{dn}) of 40 dBA.

There are no specially designated areas within a 5-mi (8-km) range from the Gold Point SEZ, which is the farthest distance that noise, except extremely loud noise, would be discernable. Thus, noise impact analysis for nearby specially designated areas was not conducted.

Depending on soil conditions, pile driving might be required for installation of solar dish engines. However, the pile drivers used, such as vibratory or sonic drivers, would be relatively small and quiet, in contrast to the impulsive impact pile drivers frequently used at large-scale construction sites. Potential impacts on the nearest residences would be anticipated to be minimal, considering the distance to the nearest residences (about 2 mi [3 km] from the southern SEZ boundary).

It is assumed that most construction activities would occur during the day, when noise is better tolerated than at night because of the masking effects of background noise. In addition, construction activities for a utility-scale facility are temporary in nature (typically a few years). Construction within the proposed Gold Point SEZ would cause minimal unavoidable, but localized, short-term noise impacts on neighboring communities.

Construction activities could result in various degrees of ground vibration, depending on the equipment used and construction methods employed. All construction equipment causes ground vibration to some degree, but activities that typically generate the most severe vibrations are high-explosive detonations and impact pile driving. As is the case for noise, vibration would diminish in strength with distance. For example, vibration levels at receptors beyond 140 ft (43 m) from a large bulldozer (87 VdB at 25 ft [7.6 m]) would diminish below the threshold of perception for humans, which is about 65 VdB (Hanson et al. 2006). During the construction phase, no major construction equipment that can cause ground vibration would be used, and no residences or sensitive structures are located in close proximity. Therefore, no adverse vibration impacts are anticipated from construction activities, including pile driving for dish engines.

Transmission lines would be constructed within a designated ROW to connect to the nearest regional power grid. A regional 120-kV transmission line is located about 22 mi (35 km) from the proposed Gold Point SEZ; thus, construction of a transmission line over this relatively long distance would be needed to connect to the regional grid. For construction of transmission lines, noise sources and their noise levels might be similar to construction noise sources at an industrial facility of a comparable size. Transmission line construction for the Gold Point SEZ could be performed in about 2 years. However, the area under construction along the transmission line ROW would move continuously, so no particular area would be exposed to noise for a prolonged period. Therefore, potential noise impacts on nearby residences along the transmission line ROW, if any, would be minor and temporary in nature.

11.6.15.2.2 Operations

Noise sources common to all or most types of solar technologies include equipment motion from solar tracking, maintenance and repair activities (e.g., washing mirrors or replacing broken mirrors) at the solar array area; commuter/visitor/support/delivery traffic within and around the solar facility; and control/administrative buildings, warehouses, and other auxiliary

buildings/structures. Diesel-fired emergency power generators and firewater pump engines would be additional sources of noise, but their operations would be limited to several hours per month (for preventive maintenance testing).

With respect to the main solar energy technologies, noise-generating activities in the PV solar array area would be minimal, related mainly to solar tracking, if used. On the other hand, dish engine technology, which employs collector and converter devices in a single unit, generally has the strongest noise sources.

For the parabolic trough and power tower technologies, most noise sources during operations would be in the power block area, including the turbine generator (typically in an enclosure), pumps, boilers, and dry- or wet-cooling systems. The power block is typically located in the center of the facility. On the basis of a 250-MW parabolic trough facility with a cooling tower (Beacon Solar, LLC 2008), simple noise modeling indicates that noise levels around the power block would be more than 85 dBA, but about 51 dBA at the facility boundary, about 0.5 mi (0.8 km) from the power block area. For a facility located near the southern SEZ boundary, the predicted noise level would be about 36 dBA at the nearest residences, located about 2 mi (3 km) from the SEZ boundary, which is below the typical daytime mean rural background level of 40 dBA. If TES were not used (i.e., if the operation were limited to daytime, 12 hours only[12]), the EPA guideline level of 55 dBA (as L_{dn} for residential areas) would occur at about 1,370 ft (420 m) from the power block area, and thus, would not be exceeded outside of the proposed SEZ boundary. At the nearest residences, about 41 dBA L_{dn} (i.e., minimal contribution from facility operation) would be estimated. This is well below the EPA guideline of 55 dBA L_{dn} for residential areas. However, day–night average noise levels higher than those estimated above by using simple noise modeling would be anticipated if TES were used during nighttime hours, as explained below and in Section 4.13.1.

On a calm, clear night typical of the proposed Gold Point SEZ setting, the air temperature would likely increase with height (temperature inversion), because of strong radiative cooling. Such a temperature profile tends to focus noise downward toward the ground. There would be little, if any, shadow zone[13] within 1 or 2 mi (1.6 or 3 km) of the noise source in the presence of a strong temperature inversion (Beranek 1988). In particular, such conditions add to the effect of noise being more discernable during nighttime hours, when the background noise levels are lowest. To estimate the day–night average noise level (L_{dn}), 6-hour nighttime generation with TES is assumed after 12-hour daytime generation. For nighttime hours under temperature inversion, 10 dB is added to noise levels estimated from the uniform atmosphere (see Section 4.13.1). On the basis of these assumptions, the estimated nighttime noise level at the nearest residences (about 2 mi [3.2 km] from the southern SEZ boundary) would be 46 dBA, which is well above the typical nighttime mean rural background level of 30 dBA. The day–night average noise level is estimated to be about 48 dBA L_{dn}, which is below the EPA guideline of 55 dBA L_{dn} for residential areas. The assumptions are conservative in terms of operating hours, and no credit was given to other attenuation mechanisms, so it is likely that noise levels would be

[12] Maximum possible operating hours at the summer solstice, but limited to 7 to 8 hours at the winter solstice.

[13] A shadow zone is defined as the region in which direct sound does not penetrate because of upward diffraction.

lower than 48 dBA L_{dn} at the nearest residences, even if TES were used at a solar facility. Consequently, operating parabolic trough or power tower facilities using TES could result in some adverse noise impacts on the nearest residences, depending on background noise levels and meteorological conditions. In the permitting process, refined noise propagation modeling considering topographical features might be warranted, along with measurement of background noise levels.

The solar dish engine is unique among CSP technologies because it generates electricity directly and does not require a power block. A single, large solar dish engine has relatively low noise levels, but a solar facility might employ tens of thousands of dish engines, which would cause high noise levels around such a facility. For example, the proposed 750-MW SES Solar Two dish engine facility in California would employ as many as 30,000 dish engines (SES Solar Two, LLC 2008). At the proposed Gold Point SEZ, on the basis of the assumption of dish engine facilities of up to 428-MW total capacity (covering 80% of the total area, or 3,848 acres [15.6 km^2]), up to 17,100 25-kW dish engines could be employed. For a large dish engine facility, several hundred step-up transformers would be embedded in the dish engine solar field, along with a substation; however, the noise from these sources would be masked by dish engine noise.

The composite noise level of a single dish engine would be about 88 dBA at a distance of 3 ft (0.9 m) (SES Solar Two, LLC 2008). This noise level would be attenuated to about 40 dBA (typical of the mean rural daytime environment) within 330 ft (100 m). However, the combined noise level from tens of thousands of dish engines operating simultaneously would be high in the immediate vicinity of the facility. For example, they would be about 48 dBA at 1.0 mi (1.6 km) and 43 dBA at 2 mi (3 km) from the boundary of the square-shaped dish engine solar field; both values are higher than the typical daytime mean rural background level of 40 dBA. However, these levels would occur at somewhat shorter distances than the aforementioned distances, considering noise attenuation by atmospheric absorption and temperature lapse during daytime hours. To estimate noise levels at the nearest residences, it was assumed dish engines were placed all over the Gold Point SEZ at intervals of 98 ft (30 m). Under these assumptions, the estimated noise level at the nearest residences, about 2 mi (3.2 km) south of the SEZ boundary, would be about 43 dBA, which is somewhat higher than the typical daytime mean rural background level of 40 dBA. On the basis of 12-hr daytime operation, the estimated 43 dBA L_{dn} at these residences is well below the EPA guideline of 55 dBA L_{dn} for residential areas. On the basis of other noise attenuation mechanisms, noise levels at the nearest residences would be lower than the values estimated above. However, noise from dish engines could cause adverse impacts on the nearest residences, depending on background noise levels and meteorological conditions. Thus, consideration of minimizing noise impacts is very important when siting dish engine facilities. Direct mitigation of dish engine noise through noise control engineering could also be considered.

During operations, no major ground-vibrating equipment would be used. In addition, no sensitive structures are located close enough to the proposed Gold Point SEZ to experience physical damage. Therefore, during operation of any solar facility, potential vibration impacts on surrounding communities and vibration-sensitive structures would be negligible.

Transformer-generated humming noise and switchyard impulsive noises would be generated during the operation of solar facilities. These noise sources would be located near the power block area, typically near the center of a solar facility. Noise from these sources would generally be limited within the facility boundary and not be heard at the nearest residences, assuming a 2.5-mi (4.0-km) distance (at least 0.5 mi [0.8 km] to the facility boundary and 2 mi [3.2 km] to the nearest residences). Accordingly, potential impacts of these noise sources on the nearest residences would be minimal.

For impacts from transmission line corona discharge noise during rainfall events (discussed in Section 5.13.1.5), the noise level at 50 ft (15 m) and 300 ft (91 m) from the center of 230-kV transmission line towers would be about 39 and 31 dBA (Lee et al. 1996), respectively, typical of daytime and nighttime mean background noise levels in rural environments. Corona noise includes high-frequency components, considered to be more annoying than low-frequency environmental noise. However, corona noise would not likely cause impacts unless a residence was located nearby (e.g., within 500 ft [152 m] of a 230-kV transmission line). The proposed Gold Point SEZ is located in an arid desert environment, and incidents of corona discharge are infrequent. Therefore, potential impacts on nearby residences from corona noise along transmission lines within the SEZ would be negligible.

11.6.15.2.3 Decommissioning/Reclamation

Decommissioning/reclamation requires many of the same procedures and equipment used in traditional construction. Decommissioning/reclamation would include dismantling of solar facilities and support facilities such as buildings/structures and mechanical/electrical installations, disposal of debris, grading, and revegetation as needed. Activities for decommissioning would be similar to those for construction, but more limited. Potential noise impacts on surrounding communities would be correspondingly lower than those for construction activities. Decommissioning activities would be of short duration, and their potential impacts would be minimal and temporary in nature. The same mitigation measures adopted during the construction phase could also be implemented during the decommissioning phase.

Similarly, potential vibration impacts on surrounding communities and vibration-sensitive structures during decommissioning of any solar facility would be lower than those during construction and thus negligible.

11.6.15.3 SEZ-Specific Design Features and Design Feature Effectiveness

The implementation of required programmatic design features described in Appendix A, Section A.2.2, would greatly reduce or eliminate the potential for noise impacts from development and operation of solar energy facilities. While some SEZ-specific design features are best established when specific project details are being considered, measures that can be identified at this time include the following:

- Noise levels from cooling systems equipped with TES should be managed so that levels at the nearby residences to the south of the SEZ are kept within applicable guidelines. This could be accomplished in several ways, for example, through placing the power block approximately 1 to 2 mi (1.6 to 3 km) or more from residences, limiting operations to a few hours after sunset, and/or installing fan silencers.

- Dish engine facilities within the Gold Point SEZ should be located more than 1 to 2 mi (1.6 to 3 km) from the nearby residences. Direct noise control measures applied to individual dish engine systems could also be used to reduce noise impacts at nearby residences.

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11.6.16 Paleontological Resources

11.6.16.1 Affected Environment

The surficial geology of the proposed Gold Point SEZ is composed entirely of thick alluvial deposits (more than 100 ft [30 m] thick), ranging in age from the Pliocene to Holocene. In the absence of a PFYC map for Nevada, a preliminary classification of PFYC Class 2 is assumed for the young Quaternary alluvial deposits, similar to that assumed for the Amargosa Valley SEZ (Section 11.1.16; see Section 4.14 for a discussion of the PFYC system). Class 2 indicates a low potential for the occurrence of significant fossil material.

11.6.16.2 Impacts

Few, if any, impacts on significant paleontological resources are likely to occur in the proposed Gold Point SEZ. However, a more detailed look at the geological deposits of the SEZ is needed to determine whether a paleontological survey is warranted. If the geological deposits are determined to be as described above and are classified as PFYC Class 2, further assessment of paleontological resources in the SEZ is not likely to be necessary. Important resources could exist; if identified, they would need to be managed on a case-by-case basis. Section 5.14 discusses the types of impacts that could occur on any significant paleontological resources found within the proposed Gold Point SEZ. Impacts would be minimized through the implementation of required programmatic design features described in Appendix A, Section A.2.2.

Indirect impacts on paleontological resources outside of the SEZ, such as through looting or vandalism, are unknown but unlikely, because any such resources would be below the surface and not readily accessed. Programmatic design features for controlling water runoff and sedimentation would prevent erosion-related impacts on buried deposits outside of the SEZ.

Approximately 22 mi (35 km) of new transmission line is assessed in this PEIS. Construction of this line would result in approximately 667 acres (2.7 km^2) of disturbance. This disturbance would occur in alluvial deposits as well as in residual materials developed in igneous and metamorphic rock (preliminarily classified as PFYC Class 1) and in residual materials developed in fine-grained sediments and in sedimentary rocks (preliminarily classified as PFYC Class 3b), depending on the exact location of the corridor. For PFYC Class 1 areas that would be crossed, there would be little or no potential for significant paleontological resources. For PFYC Class 3b areas, with an unknown potential for containing paleontological material, impacts are possible. A more detailed investigation of the residual sedimentary deposits is needed prior to project approval. A paleontological survey will likely be needed following consultation with the BLM. The appropriate course of action would be determined as established in BLM IM2008-009 (BLM 2007) and IM2009-011 (BLM 2008a). Impacts on paleontological resources related to the creation of new corridors not assessed in this PEIS would be evaluated at the project-specific level if new road or transmission construction or line upgrades are to occur.

11.6.16.3 SEZ-Specific Design Features and Design Feature Effectiveness

Impacts would be minimized through the implementation of required programmatic design features as described in Appendix A, Section A.2.2.

The need for and the nature of any SEZ-specific design features would depend on the results of future paleontological investigations; however, based on the current level of information, a need for mitigation of areas potentially classified as PFYC Class 2 or lower is not anticipated. For the transmission line corridor, mitigation may be necessary if significant paleontological resources are encountered during the survey in PFYC Class 3b areas.

11.6.17 Cultural Resources

11.6.17.1 Affected Environment

11.6.17.1.1 Prehistory

The proposed Gold Point SEZ is located in the Lida Valley, within the basin and range province in western Nevada. The earliest known use of the area was likely during the Paleoindian Period, sometime between 12,000 and 10,000 B.P. Surface finds of Paleoindian projectile points, the hallmark of the Clovis culture, have been found in the Big Smoky Valley, 35 mi (56 km) north of the SEZ, and in the Mojave Desert, 20 mi (32 km) southeast of the SEZ, but no sites in the area with any stratigraphic context have been excavated. The Clovis culture is characterized by the aforementioned fluted projectile points and a hunting and gathering subsistence economy that followed migrating herds of Pleistocene mega fauna. The ephemeral nature of Paleoindian sites in the southeastern Great Basin has given rise to the idea that Paleoindians may have been inclined to subsist off of the lake and marsh habitats provided by the ancient Pleistocene pluvial lakes that occupied a large portion of the Great Basin. Consequently, the sites are difficult to find as they have been buried by the ebb and flow of the pluvial lakes. This slightly later cultural material associated with the pluvial lake habitations is referred to as the Western Pluvial Lakes Tradition, or Lake Mojave culture. The archaeological assemblage associated with this cultural tradition is characterized by stemmed projectile points, leaf-shaped bifaces, scrapers, crescents, and in some cases groundstone tools for milling plant material. Often projectile points and tools were made from locally procured obsidian, sources of which are not far from the proposed Gold Point SEZ—Montezuma Range, 15 mi (24 km) north of the SEZ, Cave Spring, 35 mi (56 km) northwest of the SEZ, and Silver Peak, 50 mi (80 km) northwest of the SEZ (Fowler and Madsen 1986; NROSL 2009).

The Early Archaic Period in the region began with the recession of most of the pluvial lakes in the area, about 8,000 to 6,000 B.P., and extended until about 4,000 B.P. Archaic Period groups likely congregated around marsh areas that were still extant, but also utilized the vast caves in the mountains of the Great Basin. The settlement system in some areas was likely based around a central base camp, with temporary camps located on the margins of their territory to exploit resources that were not in the immediate vicinity of the base camp. Archaic groups would sometimes perform communal hunts, especially antelope drives, in which antelope were herded into a corral and then shot, and rabbit drives, in which large nets were used. Some of the key Archaic Period sites in the Great Basin region are Gatecliff Shelter and Toquima Cave, near Austin, Nevada, about 150 mi (241 km) north of the SEZ. The archaeological assemblage from the Early Archaic Period maintains some cultural continuity with the previous period, consisting of large notched Elko and Gatecliff points, leaf-shaped bifaces, scrapers, drills, gravers, and manos and metates. A site with an Elko point was identified within a 5-mi (8-km) radius of the proposed Gold Point SEZ (Fowler and Madsen 1986; Neusius and Gross 2007; McGonagle and Waski 1978).

The Middle Archaic Period, 4,000 to 1,500 B.P., is the time of the climatic shift known as the Little Pluvial, a wetter and cooler climate that caused some of the pluvial lakes to re-fill. The cultural material of this time period is similar to that of the Early Archaic, with an increased concentration of millingstones, mortars, and pestles and the appearance of normally perishable items that become well preserved in the arid Great Basin climate, such as wicker baskets, split-twig figurines, duck decoys, and woven sandals (Beck and Jones 2008).

In the vicinity of the proposed Gold Point SEZ, the Late Archaic Period began about 1,500 B.P. and extended until about 800 B.P. Major technological shifts occurred during this period, evidenced by smaller projectile points that were more useful because groups began using bow-and-arrow technology instead of the atlatl and dart technology. There were also changes in subsistence techniques, particularly in the use of horticulture. Around A.D. 1000 Numic-speaking groups migrated into the region; however, the exact timing of these events is unclear and is a subject for further research in the region. These Numic-speaking people were the antecedents of the Northern Paiute and Western Shoshone, and the archaeological assemblage associated with this time period consists of Desert Series projectile points, brown-ware ceramics, unshaped manos and millingstones, incised stones, mortars, pestles, and shell beads. Contemporary Native Americans dispute the separation of periods between the Late Archaic and Numic periods, because they believe that they have been in the area since time immemorial, and see themselves as descendants of all prehistoric people, not just of Numic derivation. The following section describes the cultural history of the time period in greater detail.

11.6.17.1.2 Ethnohistory

The proposed Gold Point SEZ is located in territory most often ascribed to the Western Shoshone (Thomas et al. 1986), but is close to areas used jointly by the Western Shoshone and the Owens Valley branch of the Northern Paiute. Both Shoshone and Paiute speakers lived around modern Lida, 6 mi (10 km) northwest of the proposed SEZ, and Paiute families lived at Pigeon Spring, 14 mi (23 km) west of the SEZ. The families based around Lida joined the Fish Lake Valley Northern Paiute during the pine nut harvest near Pigeon Springs (Steward 1938).

Western Shoshone

The Western Shoshone are a group of ethnically similar Central Numic speakers who traditionally occupied a swath of the central Great Basin stretching from Death Valley in California through central Nevada and northwestern Utah to southeastern Idaho (Thomas et al. 1986), lying primarily within the basin and range province of the Great Basin. The Western Shoshone lived in small groups with rather fluid membership, usually identified with the land on which they were based. Their subsistence base and lifestyle varied with the resources within their traditional range. Groups often established stable base camps near reliable water sources where they could grow crops. From these base camps, they would move seasonally in a flexible round to exploit resources in the surrounding mountains and other areas as they became available. They gathered a wide variety of plant resources, which they supplemented by

hunting and fishing (Stoffle et al. 1990; Crum 1994; Fowler 1986; Steward 1938). Pine nuts, available in the mountains, were a storable staple. Pronghorn antelope, bighorn sheep, and mule deer were among the large game animals they hunted, but smaller game, including rodents, birds, and, where available, fish, provided more of the protein in their diet. Groups varied in size and composition with the season. The largest groups gathered for the pine nut harvest, which could include a rabbit or antelope drive as well. Winter villages were usually close to stores of pine nuts.

The Timbisha Shoshone are the proposed SEZ's closest Western Shoshone neighbors. Recognized as a Tribe by the Federal Government in 1983, they remained landless until 2000 when the Timbisha Shoshone Homeland Act granted them lands within Death Valley National Park and four parcels outside the park, including 3,000 acres (12 km^2) outside Lida, Nevada, about 6 mi (10 km) northwest of the SEZ. Additional information on the Western Shoshone may be found in Section 11.1.17.1.2.

Owens Valley Paiute

The Owens Valley Paiute inhabit the valley of the Owens River that parallels the eastern slope of the Sierra Nevada. They speak Mono, a Western Numic language, and are linguistically closely tied to the Northern Paiute (Liljeblad and Fowler 1986). A brief description of the Owens Valley Paiute is given in Section 11.1.17.1.2.

11.6.17.1.3 History

The Great Basin was one of the last areas in the continental United States to be fully explored. The harsh and rugged landscape deterred most European and American explorers until the late eighteenth century. Several early explorers made their way into the southern portion of Nevada by the late eighteenth century, but the area around the proposed Gold Point SEZ was not explored by non-native people until about 1826. Fur trapping was a popular enterprise during this time, and overzealous trappers were quickly depleting their supplies of furs as they moved west in search of further materials. Peter Ogden of the Hudson's Bay Company and Jedidiah Smith of the Rocky Mountain Fur Company were part of two different expeditions that entered Nevada in 1827 and 1826, respectively. These men were seeking new beaver fields, Ogden took a more northerly route through Elko, Pershing, and Humbolt Counties, and Smith entered Nevada near Mesquite and traveled across the southern tip of Nevada into California. When he entered California, Smith was detained by Mexican authorities, as he had entered Mexican territory, and was ordered to go back the way from which he had come. However, he decided to travel farther north into California, being the first non-native person to cross the Sierra Nevada Mountains and entered Nevada just south of Lake Tahoe. From there he crossed the State of Nevada and passed about 50 mi (80 km) north of the proposed Gold Point SEZ. Fur trapping never became a lucrative enterprise in Nevada; however, these trailblazers paved the way for later explorers and mappers, like John C. Frémont. Frémont, a member of the Topographical Engineers, was commissioned to map and report on the Great Basin area in 1843 and 1844. The results of his work gained wide circulation and were of great importance in understanding the

topography of the Great Basin, both for official use and by those moving westward to seek new homes and fortunes. Frémont passed about 75 mi (121 km) north of the proposed Gold Point SEZ, at the northern-most point of Esmeralda County, where it meets Mineral and Nye Counties. Another fur trapping party, the Walker-Bonneville party, explored the region in 1833 to 1834. This group also likely explored the lands north of the proposed Gold Point SEZ, on its way to exploring large portions of the Yosemite Valley in California and the Great Basin (Elliott 1973).

Nevada and the Great Basin region have provided a corridor of travel for those seeking to emigrate west. Several heavily traveled trails crossed the region, although none of these trails passes particularly close to the proposed Gold Point SEZ. The Old Spanish Trail was an evolving trail system generally established in the early nineteenth century, but tended to follow previously established paths used by earlier explorers and Native Americans. The 2,700-mi (4,345-km) network of trails passes through six states, beginning in Santa Fe, New Mexico, and ending in Los Angeles, California. The closest portion of the congressionally designated Old Spanish National Historic Trail is about 131 mi (211 km) south of the proposed Gold Point SEZ, as it passes near Las Vegas, Nevada. Mormons also frequently used the Old Spanish Trail in emigrating farther west to Nevada, Arizona, and California, and often the trail is referred to as the Old Spanish Trail/Mormon Road. Other notable trails that crossed Nevada were the California Trail, a trail that followed portions of the Oregon Trail and then broke off from that trail and continued through the northern portion of Nevada along the Humbolt River, about 135 mi (217 km) north of the proposed Gold Point SEZ, until it reached California. The Pony Express Trail, a mail route that connected Saint Joseph, Missouri, to Sacramento, California, entered Nevada, just northeast of Ely, and exited just south of Lake Tahoe, the closest portion being about 145 mi (233 km) north of the SEZ (von Till Warren 1980).

With the ratification of the Treaty of Guadalupe Hidalgo in 1848, closing out the Mexican-American War, the area came under American control. In 1847, the first American settlers arrived in the Great Basin, among them Mormon immigrants under the leadership of Brigham Young, who settled in the Valley of the Great Salt Lake in Utah. They sought to bring the entire Great Basin under their control, establishing an independent State of Deseret. From its center in Salt Lake City, the church sent out colonizers to establish agricultural communities in surrounding valleys and missions to acquire natural resources such as minerals and timber. Relying on irrigation to support their farms, the Mormons often settled in the same places as the Native Americans had centuries before. The result was a scattering of planned agricultural communities from northern Arizona to southern Idaho, and parts of Wyoming, Nevada, and southern California. One of the first Mormon settlements in Nevada was a trading post, located just north of Genoa, Nevada, about 166 mi (267 km) northwest of the SEZ. Established in 1850, this trading post provided supplies for those traversing the California Trail.

Nevada's nickname is the "Silver State," for the 1859 Comstock Lode strike in Virginia City, about 179 mi (288 km) northwest of the proposed Gold Point SEZ. This was the first major silver discovery in the United States, and with the news of the strike, hopeful prospectors flocked to the area in an effort to capitalize on the possible wealth under the surface of the earth. The discovery of the Comstock Lode led to the creation of Virginia City and other nearby towns that served the population influx. The population increase was so dramatic that in 1850 there were fewer than a dozen non-native people in the State of Nevada; by 1860 there were 6,857; and by

1875 an estimated 75,000 people had migrated to the state. The Comstock Lode strike is important to the history of Nevada, not only because of the population growth and significant amount of money that was consequently brought to the area, but also because of several technological innovations that were created and employed in the mines, namely, the use of square-set timbering. This technique kept loose soil from collapsing on miners, a concept that eventually was employed around the world in other mines (Paher 1970).

Mining for valuable deposits occurred in all regions of the State of Nevada, including in the vicinity of the proposed Gold Point SEZ. The closest mine to the SEZ was the Gold Point mine, just 2 mi (3 km) south of the SEZ. The Gold Point mine, originally called the Lime Mine, was mined for its lime deposits. About 1908 the mine adopted the name Hornsilver, as that became the more lucrative mineral for which to mine. More than 225 wooden buildings covered the town, but by 1915 mining had slowed. The mine was purchased by another investor in 1922, and in 1930 when more gold was mined than silver, the town changed its name to Gold Point. By 1942 mining operations ceased, and most of the town was abandoned when workers for the war effort were needed. Other mines and small towns popped up in the mountains surrounding the SEZ at Gold Mountain, 9 mi (14 km) south of the SEZ, Tule Canyon, 9 mi (14 km) west of the SEZ, Lida, 7 mi (11 km) northwest of the SEZ, and Oriental, 10 mi (16 km) south of the SEZ. Goldfield, about 20 mi (32 km) northeast of the SEZ, was one of the single most prosperous gold strikes in the west. Initially discovered in 1902, the mining stampede to the Goldfield area began in 1904, with the most lucrative years 1906 and 1907 producing about $15 million in gold ore (Paher 1970). The Goldfield Historic District is listed in the NRHP.

Nevada's desert-mountain landscape has made it a prime region for use by the U.S. military for several decades. Beginning in October 1940, President Franklin D. Roosevelt established the Las Vegas Bombing and Gunnery Range, a 3.5-million acre (14,164 km²) parcel of land northwest of Las Vegas, near Indian Springs, Nevada, 107 mi (172 km) southeast of the SEZ. At the start of the Cold War in 1948, the range was renamed Nellis Air Force Base. For the next 41 years testing of nuclear weapons, as well as regular Air Force training missions, occurred throughout the regions of the NTS. The proposed Gold Point SEZ does not fall within the specific boundaries of the NTS and Range; the closest portion of the military installation is about 20 mi (36 km) east. However, the Air Force Base and associated ranges have affected the overall history and context of the region.

11.6.17.1.4 Traditional Cultural Properties—Landscape

The Native Americans whose historical homelands lie within the Great Basin have traditionally tended to take a holistic view of the world. They tend to view the sacred and profane as inextricably intertwined. Landscapes as a whole are often culturally important. Adverse effects on one part damage the whole (Stoffle 2001). From their perspective, landscapes include places of power. Among the most important such places are sources of water; peaks, mountains, and elevated features; caves; distinctive rock formations; and panels of rock art. Places of power are important to the religious beliefs of the Western Shoshone and Paiute. They may be sought out for individual vision quests or healing. The view from such a point of power or the ability to see from one important place to another can be an important element of its integrity (Stoffle and

Zedeño 2001b). Landscapes as a whole are often tied together by a network of culturally important trails (Stoffle and Zedeño 2001a).

The proposed Gold Point SEZ is located in the Lida Valley between Mount Jackson, the Jackson Ridge, Magruder Mountain, and Slate Ridge. Traditionally, Tribal camps in the area were located near springs in the foothills or mountains. Those closest to the proposed SEZ were clustered around Lida, in the area now included in the Timbisha Shoshone Reservation. Other single-family camps with ties to the Lida group were located near springs in Tule Canyon, 10 mi (16 km) southwest of the SEZ; Gold Mountain, 10 mi (16 km) south of the SEZ; Stonewall Mountain, 16 mi (26 km) northeast; Montezuma Peak, 20 mi (33 km) north; and near Goldfield, 25 mi (40 km) northeast. Rockshelters near the mouth of Lida Canyon may have served as a meeting place for these groups and retain cultural significance. These groups hunted game and gathered plant resources in the surrounding hills. Plant or small game resources on the valley floor would have been exploited in season as well. The Lida group managed the vegetation on Magruder Mountain by selective burning to encourage the growth of preferred plants. They traveled through Lida Valley to reach seasonally available resources on Stonewall Flat and in Clayton Canyon near Gold Point (Steward 1938).

Mountain prominences are often culturally important landscape features and may be places of power. Magruder Mountain is reported to have cultural significance for the Timbisha. Project-specific investigations would need to establish cultural importance through consultation with the relevant Native American Tribe(s). Mt. Grant, where the Northern Paiute believe their ancestors emerged (Fowler et al. 1970), is 110 mi (177 km) northwest and is not likely to be visible from the SEZ.

11.6.17.1.5 Cultural Surveys and Known Archaeological and Historical Resources

In the proposed Gold Point SEZ, no surveys have been conducted, and consequently no cultural resources have been identified. However, within 5 mi (8 km) of the SEZ, 18 surveys have been conducted, resulting in the recording of 12 cultural resources. Nine of these sites are prehistoric in nature, two are rockshelters, and seven are isolated flakes or lithic scatters. The other three sites located within 5 mi (8 km) of the SEZ are historic resources (de Dufour 2009). One of these sites is a mill site, and another is the Gold Point mining camp and associated buildings, which has been determined to be eligible for listing in the NRHP. The other historic site is an historic Native American meeting place and medicine making area, referred to as "medicine rock." Historic mining debris was also documented at the site.

The proposed Gold Point SEZ has potential to yield significant cultural resources, especially those related to historical mining operations that took place in the vicinity of the SEZ. Prehistoric resources are not as likely to be encountered in the vicinity of the SEZ.

The BLM has also designated several locations within 50 mi (80 km) of the proposed Gold Point SEZ as cultural resources that should be managed for conservation (BLM 1997); these areas include significant petroglyph sites.

National Register of Historic Places

There are no historic properties listed in the NRHP in the SEZ or within 5 mi (8 km) of the SEZ. However, the Gold Point town site, 2 mi (3 km) south of the proposed Gold Point SEZ, has been determined to be eligible for listing in the NRHP. The rockshelters mentioned above, if grouped as a district with several other nearby sites, could be considered eligible for listing in the NRHP as well.

The county of Esmeralda maintains only one property in the NRHP, the Goldfield Historic District, about 21 mi (34 km) northeast of the proposed Gold Point SEZ. The only other NRHP property in the vicinity of the SEZ is the Death Valley Scotty Historic District, 25 mi (40 km) south of the SEZ in Inyo County, California.

11.6.17.2 Impacts

Direct impacts on significant cultural resources could occur in the proposed Gold Point SEZ; however, further investigation is needed, because no cultural resource surveys have been conducted within the boundaries of the SEZ. The area around the proposed Gold Point SEZ has the potential to provide significant resources related to historic mining operations. A cultural resource survey of the entire APE, including consultation with Native American Tribes, would first need to be conducted to identify archaeological sites, historic structures and features, and traditional cultural properties, and an evaluation would need to follow to determine whether any are eligible for listing in the NRHP as historic properties. Section 5.15 discusses the types of effects that could occur on any significant cultural resources found within the proposed Gold Point SEZ. Impacts would be minimized through the implementation of required programmatic design features described in Appendix A, Section A.2.2. Programmatic design features assume that the necessary surveys, evaluations, and consultations will occur. No traditional properties have been identified to date within the vicinity of the SEZ.

Indirect impacts on cultural resources that result from erosion outside of the SEZ boundary (including along ROWs) are unlikely, assuming programmatic design features to reduce water runoff and sedimentation are implemented (as described in Appendix A, Section A.2.2).

The Gold Point town site is in view of the SEZ. Depending on the full range of reasons for its eligibility for listing in the NRHP, visual impacts on this property are likely as a result of solar energy development in the valley below.

The nearest transmission line is about 22 mi (35 km) northeast of the proposed Gold Point SEZ, and the construction of a new transmission line to connect to this one would result in the disturbance of 667 acres (2.7 km²). Four sites that are potentially eligible for inclusion in the NRHP and three additional sites that have not been evaluated for NRHP inclusion could potentially be affected either directly or indirectly, depending on the exact location of the line. One site is a multicomponent site consisting of multiple prehistoric lithic scatters, a circular rock alignment, petroglyphs, historic shelters/lean-tos, and associated historic debris; another site is an

historic and modern dump associated with the town of Goldfield that could possibly be affected with construction of the transmission line. A prehistoric campsite could also be affected by this transmission line. Another site is a potentially eligible multicomponent site, made up of petroglyphs, a lithic scatter, and an historic coyote trap. Visual impacts on the Goldfield Historic District are also possible. Indirect impacts, such as vandalism or theft, could occur if significant resources are close to the transmission ROW. The nearest access road is NV 774, and it runs adjacent to the SEZ, so no further construction for access is anticipated assuming this road would be used. Programmatic design features assume that the necessary surveys, evaluations, and consultations for the ROWs will occur, as with the project footprint within the SEZ. Impacts on cultural resources related to the creation of new corridors not assessed in this PEIS would be evaluated at the project-specific level if new road or transmission construction or line upgrades are to occur.

11.6.17.3 SEZ-Specific Design Features and Design Feature Effectiveness

Programmatic design features to mitigate adverse effects on significant cultural resources, such as avoidance of significant sites and features, are provided in Appendix A, Section A.2.2.

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. SEZ-specific design features could include:

- Implementation of design features to address visual impacts discussed in Section 11.6.14 and in the programmatic design features listed in Appendix A, Section A.2.2, would help to mitigate visual impacts on the Gold Point town site from development in the SEZ and on the Goldfield Historic District as a result of transmission line construction.

11.6.18 Native American Concerns

Native Americans share many environmental and socioeconomic concerns with other ethnic groups. This section focuses on concerns specific to Native Americans and to which Native Americans bring a distinct perspective. For a discussion of issues of possible Native American concern shared with the population as a whole, several sections in this PEIS should be consulted. General topics of concern are addressed in Section 4.16. Specifically for the proposed Gold Point SEZ, Section 11.6.17 discusses archaeological sites, historic structures, landscapes, and traditional cultural properties; Section 11.6.8 discusses mineral resources; Section 11.6.9.1.3 discusses water rights and water use; Section 11.6.10 discusses plant species; Section 11.6.11 discusses wildlife species, including wildlife migration patterns; Section 11.6.13 discusses air quality; Section 11.6.14 discusses visual resources; Sections 11.6.19 and 11.6.20 discuss socioeconomics and environmental justice, respectively; and issues of human health and safety are discussed in Section 5.21.

11.6.18.1 Affected Environment

The proposed Gold Point SEZ falls within the Tribal traditional use area generally attributed to the Western Shoshone (Liljeblad and Fowler 1986) and is within the area recognized as traditionally belonging to the Western Shoshone by the Indian Claims Commission (Clemmer and Stewart 1986). Lying near the northwestern edge of Western Shoshone territory, the SEZ was also accessible to the Owens Valley branch of the Northern Paiutes, who were neighbors of and on friendly terms with the Western Shoshone (Steward 1938). All federally recognized Tribes with Western Shoshone or Owens Valley Paiute roots have been contacted and provided an opportunity to comment or consult regarding this PEIS. They are listed in Table 11.6.18.1-1. Details of government-to-government consultation efforts are presented in Chapter 14; a list of all federally recognized Tribes contacted for this PEIS is given in Appendix K.

11.6.18.1.1 Territorial Boundaries

Western Shoshone

The Western Shoshone traditionally occupied a swath of the central Great Basin stretching from Death Valley in California through central Nevada and northwestern Utah to southeastern Idaho (Thomas et al. 1986). The proposed Gold Point SEZ lies near the northwestern periphery of the Shoshone traditional range, where Shoshone territory blends into Owens Valley Paiute territory. The closest Western Shoshone reservation is that of the Timbisha Shoshone. The Timbisha Shoshone Homeland Act of 2000 provided the Timbisha with a discontinuous reservation that includes parcels of land at Furnace Creek in Death Valley National Park; Death Valley Junction, California; Centennial, California; Scotty's Junction, Nevada; and Lida, Nevada. The parcel near Lida is only 6 mi (10 km) northwest of the proposed Gold Point SEZ.

TABLE 11.6.18.1-1 Federally Recognized Tribes with Traditional Ties to the Proposed Gold Point SEZ

Tribe	Location	State
Benton Paiute-Shoshone Tribe	Benton	California
Big Pine Paiute Tribe	Big Pine	California
Bishop Paiute Tribe	Bishop	California
Bridgeport Indian Colony	Bridgeport	California
Duck Valley Shoshone-Paiute Tribes	Owyhee	Nevada
Duckwater Shoshone Tribe	Duckwater	Nevada
Ely Shoshone Tribe	Ely	Nevada
Lone Pine Paiute-Shoshone Tribe	Lone Pine	California
Reno-Sparks Indian Colony	Reno	Nevada
Te-Moak Tribe of Western Shoshone	Elko	Nevada
Timbisha Shoshone Tribe	Death Valley	California
Yomba Shoshone Tribe	Austin	Nevada

Owens Valley Paiutes

The Owens Valley Paiutes occupy five relatively small reservations within Owens Valley in Inyo and Mono Counties, California, west of the proposed SEZ. Their traditional use area ranged from the headwaters of the Owens River near Benton, California, southward to Owens Lake. They shared the shores of Owens Lake with Western Shoshone groups. The Indian Claims Commission placed Owens Valley within the traditional territory of the Northern Paiutes, with whom the Owens Valley Tribes are linked linguistically (Liljeblad and Fowler 1986; Clemmer and Stewart 1986; Royster 2008).

11.6.18.1.2 Plant Resources

Native Americans continue to make use of a wide range of indigenous plants for food, medicine, construction materials, and other uses. Although the proposed SEZ is sparsely vegetated, some species traditionally used by Native Americans have been observed or are possible in the proposed SEZ. The vegetation present at the proposed Gold Point SEZ is described in Section 11.6.10. In general, the vegetation consists of widely spaced low shrubs. The vegetation cover types present at the SEZ are all part of the Inter-mountain Basin series. Mixed Salt Desert Scrub dominates, but there are substantial areas of Greasewood Flat, smaller amounts of Playa, and a sprinkling of Semi-desert Shrub Steppe. The proposed transmission line corridor would extend from the proposed SEZ to Goldfield, crossing the Mount Jackson Ridge and following the line of the Goldfield Hills. At these somewhat higher elevations with rolling hills, Big Sagebrush Shrubland and Xeric Mixed Sagebrush Shrubland would be encountered. Plant species in these cover types have much in common with those found in the SEZ. They would include a wider variety of sagebrush, seed-bearing grasses, and possibly juniper trees (USGS 2005b). As shown in Table 11.6.18.1-2, there are some plants found in the SEZ and along the transmission corridor that have been traditionally used by Native Americans for food

TABLE 11.6.18.1-2 Plant Species Important to Native Americans Observed or Likely To Be Present in the Proposed Gold Point SEZ

Common Name	Scientific Name	Status
Food		
Basin wildrye	*Leymus cinerus*	Possible
Beavertail prickly pear	*Opuntia basilaris*	Observed
Buckwheat	*Eriognum* spp.	Observed
Dropseed	*Sporobolus airoides*	Possible
Galleta	*Pleuraphis jamesii*	Possible
Joshua tree	*Yucca brevifolia*	Observed
Nevada bluegrass	*Poa Secunda*	Possible
Sagebrush	*Artemisia* spp.	Possible
Saltbush	*Atriplex* spp.	Observed
Spikerush	*Eleocharis palustris*	Possible
Wheatgrass	*Elymus lanceolatus*	Possible
Wolfberry	*Lycium andersonii*	Possible
Medicine		
Mormon tea	*Ephedra nevadensis*	Possible
Saltbush	*Atriplex* spp.	Observed

Sources: Field visit; USGS (2005b); Steward (1938); Fowler (1986).

and medicine (Steward 1938; Fowler 1986). However, project-specific analyses will be needed to determine their presence at any proposed development site. The importance of any stand to Native Americans must be determined in consultation with the affected Tribe(s). For this proposed SEZ, the Timbisha are likely to be the most directly affected. Magruder Mountain, on the western end of the valley, has traditionally been an important place for gathering plant resources. Western Shoshone families living in the Lida area would burn the brush on its slopes to create a better environment for preferred food plants including wheatgrass (Steward 1938).

11.6.18.1.3 Other Resources

Water is an essential prerequisite for life in the arid areas of the Great Basin. As a result, it is a keystone of many desert cultures' religions. Desert cultures tend to consider all water sacred and a purifying agent. Water sources are often associated with rock art. Springs are often associated with powerful beings, and hot springs in particular figure prominently in Owens Valley Paiute creation stories. Water sources are seen as connected; damage to one source damages all (Stoffle and Zedeño 2001a). Tribes are also sensitive about the use of scarce local water supplies for the benefit of distant communities and recommend that determination of adequate water supplies be a primary consideration as to whether a site is suitable for the development of a utility-scale solar energy facility (Moose 2009).

Wildlife likely to be found in the proposed Gold Point SEZ is described in Section 11.6.11. Species traditionally hunted by local Native Americans whose range includes the SEZ are listed in Table 11.6.18.1-3. Most of these are small animals and birds common throughout much of the great basin. Traditionally important large game animals include mule deer (*Odocoileus hemionus*), bighorn sheep (*Ovis canadensis*), and pronghorn (*Antilocapra americana*) (Steward 1938). Pronghorn are possible, but not common, in Lida Valley. Bighorn sheep mostly occur father north (BLM 1994). The proposed SEZ and transmission corridor are within the range of mule deer.

11.6.18.2 Impacts

In the past, the Western Shoshone and Owens Valley Paiutes have expressed concern over project impacts on a variety of resources. They tend to take a holistic view of their

TABLE 11.6.18.1-3 Animal Species used by Native Americans as Food Whose Range Includes the Proposed Gold Point SEZ

Common Name	Scientific Name	Status
Mammals		
Badger	*Taxidea taxus*	All year
Black-tailed jackrabbit	*Lepus californicus*	All year
Chipmunk	*Tamias* spp.	All year
Cottontail	*Silvilagus* spp.	All year
Coyote	*Canis latrans*	All year
Gray fox	*Urocyon cinereoargenteus*	All year
Kangaroo rat	*Dipodomys* spp.	All year
Kit fox	*Vulpes macotis*	All year
Mule deer	*Odocoileus hemionus*	All year
Pocket mouse	*Perognathus* spp.	All year
Porcupine	*Erethizon dorsatum*	All year
White-tailed antelope squirrel	*Ammospermophilus leucurus*	All year
Wood rat	*Neotoma* spp.	All year
Birds		
Burrowing owl	*Athene cunicular*	Summer
Common raven	*Corvus corax*	All year
Ferruginous hawk	*Buteo regalis*	Winter
Golden eagle	*Aquila chrysaetos*	All year
Great horned owl	*Bubo virginianus*	All year
Northern mockingbird	*Mimus polyglottos*	All year
Reptiles		
Western rattlesnake	*Crotalus viridis*	All year
Desert horned-lizard	*Phrynosoma platyrhinos*	All year

Sources: Field visit; USGS (2005b); Steward (1938); Fowler (1986).

traditional homelands. For them, cultural and natural features are inextricably bound together. Western distinctions between the sacred and the secular have no meaning in their traditional worldview. Impacts on one part are seen as having ripple effects on the whole (Stoffle and Zedeño 2001b). While no comments specific to the proposed Gold Point SEZ have been received from Native American Tribes to date, the Big Pine Paiute Tribe of the Owens Valley has commented on the scope of the PEIS. The Tribe recommends that the BLM preserve undisturbed lands intact and that recently disturbed lands, such as abandoned farm fields, rail yards, mines, and airfields, be given primary consideration for solar energy development (Moose 2009).

Potential impacts on existing water supplies are also a primary concern (Moose 2009). There are springs located throughout the hills that surround Lida Valley. Excessive drawdown of groundwater for the construction and operation of solar energy facilities could reduce or eliminate the flow from these culturally important resources.

During energy development projects in adjacent areas, other Great Basin Tribes have expressed concern over adverse effects on a wide range of resources. Among these are geophysical features and physical cultural remains. Known resources of this type in the area of the proposed Gold Point SEZ are discussed in Section 11.6.17.1.4. Such places are often seen as important because they are thought to be places of power. They are often the location of or have ready access to a variety of plant, animal, and mineral resources (Stoffle et al. 1997). Resources that Native Americans have identified as important include food plants, medicinal plants, plants used in basketry, and plants used in construction; game animals and birds; and sources of clay, salt, and pigments (Stoffle and Dobyns 1983). Those likely to be found within the proposed Gold Point SEZ are discussed in Section 11.6.18.1.

In the past, the mountains and hills surrounding the Lida Valley have been the sites of Western Shoshone camps and villages (Steward 1938; Thomas et al. 1986). The valley floor where the SEZ would be located appears to have been a travel corridor, not a habitation area. The valley floor is sparsely vegetated; however, food plants traditionally used by the Shoshone have been observed there. It is likely that the Shoshone in the surrounding hills made seasonal use of the flora on the valley floor. An early ethnography reported great quantities of wolfberries (*Lycium* sp.) growing near Gold Point were gathered by local Tribal groups (Steward 1938).

The construction of solar energy facilities in the proposed SEZ will result in the elimination of some plants traditionally used by Native Americans. Consultation with affected Tribes will be necessary to determine whether or not traditional plant resources are present in significant amounts at a proposed project site. Lida Valley is also within the range of a number of traditional Native American game species. Construction of solar facilities will eliminate some habitat for these species. For the most part, these species are common throughout the area (see Section 11.6.11). Project-specific consultation with Western Shoshone and Northern Paiute Tribes will be required to determine whether the resources present at the proposed SEZ are significant.

As consultation with the Tribes continues and project-specific analyses are undertaken, it is possible that Native Americans will express concern over potential visual, acoustic, and other

effects of solar energy development within the SEZ on specific resources, including culturally important landscapes.

Implementation of programmatic design features, as discussed in Appendix A, Section A.2.2, should eliminate impacts on tribes' reserved water rights and the potential for groundwater contamination issues.

11.6.18.3 SEZ-Specific Design Features and Design Feature Effectiveness

Programmatic design features that would address impacts of potential concern to Native Americans, such as avoidance of sacred sites, water sources, and tribally important plant and animal species are provided in Appendix A, Section A.2.2. Mitigation of impacts on archaeological sites and traditional cultural properties is discussed in Section 11.6.17.3, in addition to the programmatic design features for historic properties presented in Appendix A, Section A.2.2.

The need for and nature of SEZ-specific design features addressing issues of potential concern would be determined during government-to-government consultation with affected Tribes listed in Table 11.6.18.1-1.

11.6.19 Socioeconomics

11.6.19.1 Affected Environment

This section describes current socioeconomic conditions and local community services within the ROI surrounding the proposed Gold Point SEZ. The ROI is a two-county area comprising Esmeralda and Nye Counties in Nevada. It encompasses the area in which workers are expected to spend most of their salaries and in which a portion of site purchases and nonpayroll expenditures from the construction, operation, and decommissioning phases of the proposed SEZ facility are expected to take place.

11.6.19.1.1 ROI Employment

In 2008, employment in the ROI stood at 16,484 (Table 11.6.19.1-1). Over the period 1999 to 2008, the annual average employment growth rate was 0.5% in Nye County and −2.7% in Esmeralda County. At 0.4%, the growth rate in the ROI as a whole was lower than the average rate for the entire state (2.7%).

In the ROI in 2006, the services sector provided the highest percentage of employment at 47.6%, followed by wholesale and retail trade at 19.3%, with a smaller employment shares held by construction (10.2%) and mining (8.3%) (Table 11.6.19.1-2).

11.6.19.1.2 ROI Unemployment

The average unemployment rate in Nye County over the period 1999 to 2008 was 6.9%, higher than the 6.1% rate for Esmeralda County (Table 11.6.19.1-3). The average rate in the

TABLE 11.6.19.1-1 ROI Employment in the Proposed Gold Point SEZ

Location	1999	2008	Average Annual Growth Rate, 1999–2008 (%)
Esmeralda County	590	448	–2.7
Nye County	15,325	16,036	0.5
ROI	15,915	16,484	0.4
Nevada	978,969	1,282,012	2.7

Sources: U.S. Department of Labor (2009a,b).

TABLE 11.6.19.1-2 2006 Employment by Sector in the ROI for the Proposed Gold Point SEZ

	Esmeralda County		Nye County		ROI	
Industry	Employment	% of Total	Employment	% of Total	Employment	% of Total
Agriculture[a]	10	7.0	325	3.6	335	3.7
Mining	10	7.0	750	8.3	760	8.3
Construction	10	7.0	925	10.2	935	10.2
Manufacturing	60	42.0	329	3.6	389	4.2
Transportation and public utilities	20	14.0	292	3.2	312	3.4
Wholesale and retail trade	60	42.0	1,714	19.0	1,774	19.3
Finance, insurance, and real estate	0	0.0	328	3.6	328	3.6
Services	30	21.0	4,340	48.1	4,370	47.6
Other	0	0.0	0	0.0	0	0
Total	143		9,029		9,172	

[a] Agricultural employment includes 2007 data for hired farmworkers.

Sources: U.S. Bureau of the Census (2009a); USDA (2009).

TABLE 11.6.19.1-3 Unemployment Rates in the ROI for the Proposed Gold Point SEZ (%)

Location	1999–2008	2008	2009[a]
Esmeralda County	6.1	5.1	8.4
Nye County	6.9	9.7	14.3
ROI	6.9	9.6	14.2
Nevada	5.0	6.7	11.0

[a] Rates for 2009 are the average for January through November.

Sources: U.S. Department of Labor (2009a–c).

ROI as a whole over this period was 6.9%, higher than the average rate for Nevada (5.0%). Unemployment rates for the first 11 months of 2009 contrast with rates for 2008 as a whole; in Nye County, the unemployment rate increased to 14.3%, and in Esmeralda County to 8.4%. The average rates for the ROI (14.2%) and for Nevada as a whole (11.0%) were also higher during this period than the corresponding average rates for 2008.

11.6.19.1.3 ROI Urban Population and Income

There are no incorporated places in the ROI and, consequently, no urban population or income.

11.6.19.1.4 ROI Population

Table 11.6.19.1-4 presents recent and projected populations in the ROI and for the state as a whole. Population in the ROI stood at 44,839 in 2008, having grown at an average annual rate of 3.7% since 2000. Growth rates for the ROI were higher than those for the entire state (3.4%) over the same period. Only one of the two counties in the ROI experienced growth in population between 2000 and 2008; population in Nye County grew at an annual rate of 3.9%, while in Esmeralda County population fell at −4.6%. The ROI population is expected to increase to 78,122 by 2021 and to 80,872 by 2023.

11.6.19.1.5 ROI Income

Total personal income in the ROI stood at $1.4 billion in 2007 and has grown at an annual average rate of 4.7% over the period 1998 to 2007 (Table 11.6.19.1-5). Per-capita income

TABLE 11.6.19.1-4 ROI Population for the Proposed Gold Point SEZ

Location	2000	2008	Average Annual Growth Rate, 2000–2008 (%)	2021	2023
Esmeralda County	971	664	–4.6	1,387	1,420
Nye County	32,485	44,175	3.9	76,735	79,452
ROI	33,456	44,839	3.7	78,122	80,872
Nevada	1,998,257	2,615,772	3.4	3,675,890	3,779,745

Sources: U.S. Bureau of the Census (2009d,e); Nevada State Demographers Office (2008).

TABLE 11.6.19.1-5 ROI Personal Income for the Proposed Gold Point SEZ

Location	1998	2007	Average Annual Growth Rate, 1998–2007 (%)
Esmeralda County			
Total income ($ billion 2008)	<0.05	<0.05	0.2
Per-capita income ($)	26,781	41,370	4.4
Nye County			
Total income ($ billion 2008)	0.9	1.4	4.8
Per-capita income ($)	28,857	31,836	1.0
ROI			
Total income ($ billion 2008)	0.9	1.4	4.7
Per-capita income ($)	28,788	31,983	1.1
Nevada			
Total income ($ billion 2008)	68.9	105.3	4.3
Per-capita income ($)	37,188	41,022	1.0

Sources: U.S. Department of Commerce (2009); U.S. Bureau of the Census (2009d,e).

also rose over the same period at a rate of 1.1%, increasing from $28,788 to $31,983. Per-capita incomes were higher in Esmeralda County ($41,370) than in Nye County ($31,836) in 2007. Growth rates in total personal income have been higher in Nye County than in Esmeralda County. Personal income growth rates in the ROI (4.7%) were higher than the rate for Nevada (4.3%), while per-capita income growth rates in the two counties were slightly lower (Esmeralda County) or much lower (Nye County) than in Nevada as a whole (1.0%).

Median household income in 2006 to 2008 varied from $42,275 in Nye County to $42,749 in Esmeralda County (U.S. Bureau of the Census 2009c).

11.6.19.1.6 ROI Housing

In 2007, more than 17,400 housing units were located in the two ROI counties, with about 95% of these located in Nye County (Table 11.6.19.1-6). Owner-occupied units account for about 72% of the occupied units in the two counties, with rental housing making up 28% of the total. Vacancy rates in 2007 were 45.4% in Esmeralda County and 19.3% in Nye County; with an overall vacancy rate of 20.6%. In 2007, 3,591 housing units in the ROI were vacant, of which 1,014 are estimated to be rental units that would be available to construction workers. There were 641 units in seasonal, recreational, or occasional use in the ROI at the time of the 2000 Census, with 9.5% of housing units in Esmeralda County and 3.5% in Nye County used for seasonal or recreational purposes.

Housing stock in the ROI as a whole grew at an annual rate of 0.6% over the period 2000 to 2007, with 682 new units added (Table 11.6.19.1-6).

The median value of owner-occupied housing in 2006 to 2008 varied from $75,600 in Esmeralda County to $122,100 in Nye County (U.S. Bureau of the Census 2009f).

11.6.19.1.7 ROI Local Government Organizations

The various local, county, and Tribal government organizations in the ROI are listed in Table 11.6.19.1-7. Although there are no Tribal government located in the ROI, members of other Tribal groups whose Tribal governments are located in adjacent counties or states reside in the ROI.

11.6.19.1.8 ROI Community and Social Services

This section describes educational, health-care, law enforcement, and firefighting resources in the ROI.

Schools

In 2007, the two-county ROI had a total of 28 public and private elementary, middle, and high schools (NCES 2009). Table 11.6.19.1-8 provides summary statistics for enrollment and

TABLE 11.6.19.1-6 Housing Characteristics in the ROI for the Proposed Gold Point SEZ

Parameter	2000	2007[a]
Esmeralda County		
Owner-occupied	305	314
Rental	150	154
Vacant units	378	389
Seasonal and recreational use	79	NA[b]
Total units	833	857
Nye County		
Owner-occupied	10,167	9,630
Rental	3,142	3,760
Vacant units	2,625	3,202
Seasonal and recreational use	562	NA
Total units	15,934	16,592
ROI		
Owner-occupied	10,472	9,944
Rental	3,292	3,914
Vacant units	3,003	3,591
Seasonal and recreational use	641	NA
Total units	16,767	17,449

[a] 2007 data for number of owner-occupied, rental, and vacant units for Esmeralda County and Nye County are not available; data are based on 2007 total housing units and 2000 data on housing tenure.

[b] NA = data not available.

Sources: U.S. Bureau of the Census (2009g-i).

TABLE 11.6.19.1-7 Local Government Organizations and Social Institutions in the ROI for the Proposed Gold Point SEZ

Governments	
City	
None	
County	
Esmeralda County	Nye County
Tribal	
None	

Sources: U.S. Bureau of the Census (2009b); U.S. Department of Interior (2010).

TABLE 11.6.19.1-8 School District Data in the ROI for the Proposed Gold Point SEZ, 2007

Location	Number of Students	Number of Teachers	Student-Teacher Ratio	Level of Service[a]
Esmeralda County	77	8	9.6	11.6
Nye County	6,427	396	16.2	9.0
ROI	6,504	404	16.1	9.0

[a] Number of teachers per 1,000 population.

Source: NCES (2009).

educational staffing and two indices of educational quality–student-teacher ratios and levels of service (number of teachers per 1,000 population). The student-teacher ratio in Nye County schools (16.2) is higher than that in Esmeralda County schools (9.6), while the level of service is higher in Esmeralda County (11.6) than elsewhere in the ROI, where there are fewer teachers per 1,000 population.

Health Care

The total number of physicians in Nye County is 41, while the number of physicians per 1,000 population is 0.9. No data are available for Esmeralda County (Table 11.6.19.1-9).

Public Safety

Several state, county, and local police departments provide law enforcement in the ROI (Table 11.6.19.1-10). Esmeralda County has 10 officers and would provide law enforcement

TABLE 11.6.19.1-9 Physicians in the Proposed Gold Point SEZ ROI, 2007

Location	Number of Primary Care Physicians	Level of Service[a]
Esmeralda County	0	--
Nye County	41	0.9
ROI	41	0.9

[a] Number of physicians per 1,000 population.

Source: AMA (2009).

TABLE 11.6.19.1-10 Public Safety Employment in the Proposed Gold Point SEZ ROI

Location	Number of Police Officers[a]	Level of Service[b]	Number of Firefighters[c]	Level of Service
Esmeralda County	10	14.5	0	0.0
Nye County	104	2.4	82	1.9
ROI	114	2.6	82	1.8

[a] 2007 data.

[b] Number per 1,000 population.

[c] 2008 data; number does not include volunteers.

Sources: U.S. Department of Justice (2008); Fire Departments Network (2009).

services to the SEZ; there are 104 officers in Nye County. Levels of service of police protection are 14.5 officers per 1,000 population in Esmeralda County and 2.4 in Nye County. Currently, there are 114 professional firefighters in the ROI (Table 11.6.19.1-10).

11.6.19.1.9 ROI Social Structure and Social Change

Community social structures and other forms of social organization within the ROI are related to various factors, including historical development, major economic activities and sources of employment, income levels, race and ethnicity, and forms of local political organization. Although an analysis of the character of community social structures is beyond the scope of the current programmatic analysis, project-level NEPA analyses would include a description of ROI social structures, contributing factors, their uniqueness, and consequently, the susceptibility of local communities to various forms of social disruption and social change.

Various energy development studies have suggested that once the annual growth in population in smaller rural communities is between 5 and 15%, alcoholism, depression, suicide, social conflict, divorce, and delinquency would increase and levels of community satisfaction would deteriorate (BLM 1980, 1983, 1996). Data on violent crime and property crime rates and on alcoholism and illicit drug use, mental health, and divorce, which might be used as indicators of social change, are presented in Tables 11.6.19.1-11 and 11.6.19-1.12, respectively.

Some variation in the level of crime exists across the ROI, with a higher rate of violent crime in Esmeralda County (4.5 crimes per 1,000 population) than in Nye County (2.8) (Table 11.6.19.1-11). Property-related crime rates are higher in Nye County (20.2) than in Esmeralda County (15.1); overall crime rates in Nye County (23.0) were higher than in Esmeralda County (19.6).

TABLE 11.6.19.1-11 County and ROI Crime Rates for the Proposed Gold Point SEZ[a]

	Violent Crime[b]		Property Crime[c]		All Crime	
Location	Offenses	Rate	Offenses	Rate	Offenses	Rate
Esmeralda County	3	4.5	10	15.1	13	19.6
Nye County	124	2.8	892	20.2	1,016	23.0
ROI	127	2.8	902	20.1	1,029	22.9

[a] Rates are the number of crimes per 1,000 population.

[b] Violent crime includes murder and non-negligent manslaughter, forcible rape, robbery, and aggravated assault.

[c] Property crime includes burglary, larceny, theft, motor vehicle theft, and arson.

Sources: U.S. Department of Justice (2009a,b).

TABLE 11.6.19.1-12 Alcoholism, Drug Use, Mental Health, and Divorce in the Proposed Gold Point SEZ ROI[a]

Geographic Area	Alcoholism[a]	Illicit Drug Use[a]	Mental Health[b]	Divorce[c]
Nevada Rural (includes Esmeralda County and Nye County)	8.0	2.7	9.5	NA[d]
Nevada				6.5

[a] Data for alcoholism and drug use represent percentage of the population over 12 years of age with dependence or abuse of alcohol, illicit drugs. Data are averages for 2004 to 2006.

[b] Data for mental health represent percentage of the population over 18 years of age suffering from serious psychological distress. Data are averages for 2002 to 2004.

[c] Divorce rates are the number of divorces per 1,000 population. Data are for 2007.

[d] NA = data not available.

Sources: SAMHSA (2009); CDC (2009).

Data on other measures of social change—alcoholism, illicit drug use, and mental health—are not available at the county level and thus are presented for the SAMHSA region in which the ROI is located (Table 11.6.19.1-12).

11.6.19.1.10 ROI Recreation

Various areas in the vicinity of the proposed Gold Point Mountain SEZ are used for recreational purposes, with natural, ecological, and cultural resources in the ROI attracting visitors for a range of activities, including hunting, fishing, boating, canoeing, wildlife watching, camping, hiking, horseback riding, mountain climbing, and sightseeing. These activities are discussed in Section 11.6.5.

Because information the number of visitors using state and federal lands for recreational activities is not available from the various administering agencies, the value of recreational resources in these areas, based solely on the number of recorded visitors, is likely to be an underestimation. In addition to visitation rates, the economic valuation of certain natural resources can also be assessed in terms of the potential recreational destination for current and future users, that is, their nonmarket value (see Section 5.17.1.1.1).

Another method of assessing recreational use is to estimate the economic impact of the various recreational activities supported by natural resources on public land in the vicinity of the proposed solar development, by identifying sectors in the economy in which expenditures on recreational activities occur. Not all activities in these sectors are directly related to recreation on state and federal lands, with some activity occurring on private land (e.g., dude ranches, golf courses, bowling alleys, and movie theaters). Expenditures associated with recreational activities formed an important part of the economy of the ROI. In 2007, 1,617 people were employed in the ROI in the various sectors identified as recreation-related, constituting 9.5% of total ROI employment (Table 11.6.19.1-13). Recreation spending also produced more than $35.4 million in

TABLE 11.6.19.1-13 Recreation Sector Activity in the Proposed Gold Point SEZ ROI, 2007

ROI	Employment	Income ($ million)
Amusement and recreation services	105	3.8
Automotive rental	13	0.4
Eating and drinking places	814	14.7
Hotels and lodging places	565	13.9
Museums and historic sites,	0	0.0
Recreational vehicle parks and campsites	54	1.5
Scenic tours	37	1.0
Sporting goods retailers	29	0.3
Total ROI	1,617	35.4

Source: MIG, Inc. (2010).

income in the ROI in 2007. The primary sources of recreation-related employment were hotels and lodging places and eating and drinking places.

11.6.19.2 Impacts

The following analysis begins with a description of the common impacts of solar development, including common impacts on recreation, social change, and livestock grazing. These impacts would occur regardless of the solar technology developed in the SEZ. The impacts of projects employing various solar energy technologies are analyzed in detail in subsequent sections.

11.6.19.2.1 Common Impacts

Construction and operation of a solar energy facility at the proposed SEZ would produce direct and indirect economic impacts. Direct impacts would occur as a result of expenditures on wages and salaries and on procurement of goods and services required for project construction and operation, and the collection of state sales and income taxes. Indirect impacts would occur as project wages and salaries, procurement expenditures, and tax revenues subsequently circulated through the economy of the state, thereby creating additional employment, income, and tax revenues. Facility construction and operation would also require in-migration of workers and their families into the ROI surrounding the site, which would affect population, rental housing, health service employment, and public safety employment. Socioeconomic impacts common to all utility-scale solar energy facilities are discussed in detail in Section 5.17. These impacts will be minimized through the implementation of programmatic design features described in Appendix A, Section A.2.2.

Recreation Impacts

Estimating the impact of solar facilities on recreation is problematic, because it is not clear how solar development in the SEZ would affect recreational visitation and nonmarket values (i.e., the value of recreational resources for potential or future visits; see Section 5.17.1.2.3). While it is clear that some land in the ROI would no longer be accessible for recreation, the majority of popular recreational locations would be precluded from solar development. It is also possible that solar development in the ROI would be visible from popular recreation locations, and that construction workers residing temporarily in the ROI would occupy accommodations otherwise used for recreational visits, thus reducing visitation and consequently affecting the economy of the ROI.

Social Change

Although an extensive literature in sociology documents the most significant components of social change in energy boomtowns, the nature and magnitude of the social impact of energy

development in small rural communities are still unclear (see Section 5.17.1.1.4). While some degree of social disruption is likely to accompany large-scale in-migration during the boom phase, insufficient evidence exists to predict the extent to which specific communities are likely to be affected, which population groups within each community are likely to be most affected, and the extent to which social disruption is likely to persist beyond the end of the boom period (Smith et al. 2001). Accordingly, because of the lack of adequate social baseline data, it has been suggested that social disruption is likely to occur once an arbitrary population growth rate associated with solar energy projects has been reached, with an annual rate of between 5 and 10% growth in population assumed to result in a breakdown in social structures, with a consequent increase in alcoholism, depression, suicide, social conflict, divorce, and delinquency and deterioration in levels of community satisfaction (BLM 1980, 1983, 1996).

In overall terms, the in-migration of workers and their families into the ROI would represent an increase of 2.3% in regional population during construction of the trough technology, with smaller increases for the power tower, dish engine, and PV technologies, and during the operation of each technology. While it is possible that some construction and operations workers will choose to locate in communities closer to the SEZ, the lack of available housing in smaller rural communities in the ROI to accommodate all in-migrating workers and families and insufficient range of housing choices to suit all solar occupations, many workers are likely to commute to the SEZ from larger communities elsewhere in the ROI, thereby reducing the potential impact of solar development on social change. Regardless of the pace of population growth associated with the commercial development of solar resources and the likely residential location of in-migrating workers and families in communities some distance from the SEZ itself, the number of new residents from outside the ROI is likely to lead to some demographic and social change in small rural communities in the ROI. Communities hosting solar development are likely to be required to adapt to a different quality of life, with a transition away from a more traditional lifestyle involving ranching and taking place in small, isolated, close-knit, homogenous communities with a strong orientation toward personal and family relationships, toward a more urban lifestyle, with increasing cultural and ethnic diversity and increasing dependence on formal social relationships within the community.

Livestock Grazing Impacts

*C*attle ranching and farming supported 80 jobs and $1.7 million in income in the ROI in 2007 (MIG, Inc. 2010). The construction and operation of solar facilities in the SEZ could result in a decline in the amount of land available for livestock grazing. However, because the amount of acreage that would be used in the proposed SEZ would be small compared to the overall size of locally affected land allotments, acreage loss would not have a significant impact on overall grazing operations, with livestock management changes or the provision of additional livestock management facilities, meaning that no loss of AUMs is anticipated.

Transmission Line Impacts

The impacts of transmission line construction could include the addition of 79 jobs in the ROI (including direct and indirect impacts) in the peak year of construction (Table 11.6.19.2-1). Construction activities in the peak year would constitute less than 0.1% of total ROI employment. A transmission line would also produce $3.7 million in income. Direct sales taxes would be $0.1 million.

Given the likelihood of local worker availability in the required occupational categories, construction of a transmission line would mean that some in-migration of workers and their families from outside the ROI would be required, with 116 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) would mean that the impact of solar facility construction on the number of vacant rental housing units is not expected to be large, with 58 rental units expected to be occupied in

TABLE 11.6.19.2-1 Proposed Gold Point SEZ ROI Socioeconomic Impacts of Transmission Line Facilities[a]

Parameter	Construction	Operations
Employment (no.)		
Direct	46	<1
Total	79	<1
Income ($ million 2008)		
Total	3.7	<0.1
Direct state taxes ($ million 2008)		
Sales	0.1	<0.1
In-migrants (no.)	116	0
Vacant housing[b] (no.)	58	0
Local community service employment (no.)		
Teachers	1	0
Physicians	0	0
Public safety	1	0

[a] Construction impacts assume 22 mi [35 km] of transmission line is required to connect SEZ solar facilities to the grid. Construction impacts were assessed for a single representative year, 2021.

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

the ROI. This occupancy rate would represent less than 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 employment (education, health, and public safety). Accordingly, one new teacher and one new public safety employee would be required in order to meet existing levels of service in the ROI.

Total operations employment impacts on the ROI (including direct and indirect impacts) of a transmission line would be less than 1 job (Table 11.6.19.2-2) and would also produce less than $0.1 million in income. Direct sales taxes would be less than $0.1 million. Operation of a transmission line would not require the in-migration of workers and their families from outside the ROI; consequently, no impacts on housing markets in the ROI would be expected, and no new community service employment would be required in order to meet existing levels of service in the ROI.

11.6.19.2.2 Technology-Specific Impacts

The economic impacts of solar energy development in the proposed SEZ were measured in terms of employment, income, state tax revenues (sales), BLM acreage rental and capacity payments, population in-migration, housing, and community service employment (education, health, and public safety). More information on the data and methods used in the analysis are provided in Appendix M.

The assessment of the impact of the construction and operation of each solar technology was based on SEZ acreage, assuming 80% of the area could be developed. To capture a range of possible impacts, solar facility size was estimated on the basis of the land requirements of various solar technologies, assuming that 9 acres/MW (0.04 km^2/MW) would be required for power tower, dish engine, and PV technologies and 5 acres/MW (0.02 km^2/MW) for solar trough technologies. Impacts of multiple facilities employing a given technology at each SEZ were assumed to be the same as impacts for a single facility with the same total capacity. Construction impacts were assessed for a representative peak year of construction, assumed to be 2021 for each technology. Construction impacts assumed that a maximum of one project could be constructed within a given year, with a corresponding maximum land disturbance of up to 3,000 acres (12 km^2). For operations impacts, a representative first year of operations was assumed to be 2023 for trough and power tower, 2022 for the minimum facility size for dish engine and PV, and 2023 for the maximum facility size for these technologies. The years of construction and operations were selected as representative of the entire 20-year study period, because they are the approximate midpoint; construction and operations could begin earlier.

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 2,287 jobs

(Table 11.6.19.2-2). Construction activities would constitute 8.0% of total ROI employment. A solar facility would also produce $138.9 million in income and $0.1 million in direct sales taxes.

Based on the scale of construction activities and the likelihood of local worker availability in the required occupational categories, construction of a solar facility would mean that some in-migration of workers and their families from outside the ROI would be required, with 1,827 persons in-migrating into the ROI. 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 be expected to be large, with 914 rental units expected to be occupied in the ROI. This occupancy rate would represent 51.6% 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, 16 new teachers, 2 physicians, and 8 public safety employees (career firefighters and uniformed police officers) would be required in the ROI. These increases would represent 2.3% of total ROI employment expected in these occupations.

Operations. Total operations employment impacts in the ROI (including direct and indirect impacts) of a build-out using solar trough technologies would be 224 jobs (Table 11.6.19.2-2). Such a solar facility would also produce $7.6 million in income and $0.1 million in direct sales taxes. Based on fees established by the BLM in its Solar Energy Interim Rental Policy (BLM 2010b), acreage rental payments would be $0.3 million, and solar generating capacity payments would total at least $5.1 million.

Based on the likelihood of local worker availability in the required occupational categories, operation of a solar facility would mean that some in-migration of workers and their families from outside the ROI would be required, with 107 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 96 owner-occupied units expected to be occupied in the ROI.

In addition to the potential impact on housing markets, in-migration would affect community service (health, education, and public safety) employment. An increase in such employment would be required to meet existing levels of service in the provision of these services in the ROI. Accordingly, one new teacher would be required in the ROI.

TABLE 11.6.19.2-2 ROI Socioeconomic Impacts Assuming Full Build-out of the Proposed Gold Point SEZ with Trough Facilities

Parameter	Maximum Annual Construction Impacts[a]	Operations Impacts[b]
Employment (no.)		
Direct	1,641	168
Total	2,287	224
Income ($ million 2008)		
Total	138.9	7.6
Direct state taxes[c] ($ million 2008)		
Sales	0.1	0.1
BLM payments ($ million 2008)		
Rental	NA	0.3
Capacity[d]	NA	5.1
In-migrants (no.)	1,827	107
Vacant housing[f] (no.)	914	96
Local community service employment		
Teachers (no.)	16	1
Physicians (no.)	2	0
Public safety (no.)	8	0

[a] Construction impacts are 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. Operations impacts were based on full build-out of the site, producing a total output of 770 MW.

[b] Unless indicated otherwise, values are reported in $ million 2008. There is currently no individual income tax in Nevada.

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

[d] The BLM annual capacity payment was based on a fee of $6,570 per MW, established by the BLM in its Solar Energy Interim Rental Policy (BLM 2010c), 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 per MW.

1
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 911 jobs (Table 11.6.19.2-3). Construction activities would constitute 3.2% of total ROI employment. Such a solar facility would also produce $55.3 million in income and less than $0.1 million in direct sales taxes.

Based on the scale of construction activities and the likelihood of local worker availability in the required occupational categories, construction of a solar facility would mean that some in-migration of workers and their families from outside the ROI would be required, with 728 persons in-migrating into the ROI. 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 364 rental units expected to be occupied in the ROI. This occupancy rate would represent 20.6% 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, seven new teachers, one physician, and three public safety employees would be required in the ROI. These increases would represent 0.9% of total ROI employment expected in these occupations.

Operations. Total operations employment impacts in the ROI (including direct and indirect impacts) of a build-out using power tower technologies would be 106 jobs (Table 11.6.19.2-3). Such a solar facility would also produce $3.4 million in income. Direct sales taxes would be less than $0.1 million. Based on fees established by the BLM in its Solar Energy Interim Rental Policy (BLM 2010b), acreage rental payments would be $0.3 million, and solar generating capacity payments would total at least $2.8 million.

Based on the likelihood of local worker availability in the required occupational categories, operation of a solar facility means that some in-migration of workers and their families from outside the ROI would be required, with 55 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 50 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.

TABLE 11.6.19.2-3 ROI Socioeconomic Impacts Assuming Full Build-out of the Proposed Gold Point SEZ with Power Tower Facilities

Parameter	Maximum Annual Construction Impacts[a]	Operations Impacts[b]
Employment (no.)		
Direct	654	87
Total	911	106
Income ($ million 2008)		
Total	55.3	3.4
Direct state taxes[c] ($ million 2008)		
Sales	<0.1	<0.1
BLM payments ($ million 2008)		
Rental	NA	0.3
Capacity[d]	NA	2.8
In-migrants (no.)	728	55
Vacant housing[f] (no.)	364	50
Local community service employment		
Teachers (no.)	7	0
Physicians (no.)	1	0
Public safety (no.)	3	0

[a] Construction impacts are 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.

Operations impacts were based on full build-out of the site, producing a total output of 428 MW.

[b] Unless indicated otherwise, values are reported in $ million 2008. There is currently no individual income tax in Nevada.

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

[d] The BLM annual capacity payment was based on a fee of $6,570 per MW, established by the BLM in its Solar Energy Interim Rental Policy (BLM 2010b), 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 per MW.

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 370 jobs (Table 11.6.19.2-4). Construction activities would constitute 1.3% of total ROI employment. Such a solar facility would also produce $22.5 million in income and less than $0.1 million in direct sales taxes.

Based on the scale of construction activities and the likelihood of local worker availability in the required occupational categories, construction of a solar facility would mean that some in-migration of workers and their families from outside the ROI would be required, with 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 148 rental units expected to be occupied in the ROI. This occupancy rate would represent 8.4% 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, three new teachers, and one public safety employees would be required in the ROI. These increases would represent less than 0.4% of total ROI employment expected in these occupations.

Operations. Total operations employment impacts in the ROI (including direct and indirect impacts) of a build-out using dish engine technologies would be 103 jobs (Table 11.6.19.2-4). Such a solar facility would also produce $3.4 million in income and less than $0.1 million in direct sales taxes. Based on fees established by the BLM in its Solar Energy Interim Rental Policy (BLM 2010b), acreage rental payments would be $0.3 million, and solar generating capacity payments would total at least $2.8 million.

Based on the likelihood of local worker availability in the required occupational categories, operation of a dish engine solar facility means that some in-migration of workers and their families from outside the ROI would be required, with 54 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 48 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.

TABLE 11.6.19.2-4 ROI Socioeconomic Impacts Assuming Full Build-out of the Proposed Gold Point SEZ with Dish Engine Facilities

Parameter	Maximum Annual Construction Impacts[a]	Operations Impacts[b]
Employment (no.)		
Direct	266	84
Total	370	103
Income ($ million 2008)		
Total	22.5	3.4
Direct state taxes[c] ($ million 2008)		
Sales	<0.1	<0.1
BLM payments ($ million 2008)		
Rental	NA	0.3
Capacity[d]	NA	2.8
In-migrants (no.)	296	54
Vacant housing[f] (no.)	148	48
Local community service employment		
Teachers (no.)	3	0
Physicians (no.)	0	0
Public safety (no.)	1	0

[a] Construction impacts are 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. Operations impacts were based on full build-out of the site, producing a total output of 428 MW.

[c] Unless indicated otherwise, values are reported in $ million 2008. There is currently no individual income tax in Nevada.

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

[d] The BLM annual capacity payment was based on a fee of $6,570 per MW, established by the BLM in its Solar Energy Interim Rental Policy (BLM 2010b), 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 per MW.

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Photovoltaic

Construction. Total construction employment impacts in the ROI (including direct and indirect impacts) from the use of PV technologies would be up to 173 jobs (Table 11.6.19.2-5). Construction activities would constitute 0.6% of total ROI employment. Such a solar development would also produce $10.5 million in income and less than $0.1 million in direct sales taxes.

Based on the scale of construction activities and the likelihood of local worker availability in the required occupational categories, construction of a solar facility would mean that some in-migration of workers and their families from outside the ROI would be required, with 138 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 69 rental units expected to be occupied in the ROI. This occupancy rate would represent 3.9% 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, one new teacher and one public safety employee would be required in the ROI. This increase would represent less than 0.2% of total ROI employment expected in this occupation.

Operations. Total operations employment impacts in the ROI (including direct and indirect impacts) of a build-out using PV technologies would be 10 jobs (Table 11.6.19.2-5). Such a solar facility would also produce $0.3 million in income and less than $0.1 million in direct sales taxes. Based on fees established by the BLM in its Solar Energy Interim Rental Policy (BLM 2010b), acreage rental payments would be $0.3 million, and solar generating capacity payments would total $2.2 million.

Given the likelihood of local worker availability in the required occupational categories, operation of a solar facility would mean that some in-migration of workers and their families from outside the ROI would be required, with five 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 five 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.

TABLE 11.6.19.2-5 ROI Socioeconomic Impacts Assuming Full Build-out of the Proposed Gold Point SEZ with PV Facilities

Parameter	Maximum Annual Construction Impacts[a]	Operations Impacts[b]
Employment (no.)		
Direct	124	8
Total	173	10
Income ($ million 2008)		
Total	10.5	0.3
Direct state taxes[c] ($ million 2008)		
Sales	<0.1	<0.1
BLM payments ($ million 2008)		
Rental	NA	0.3
Capacity[d]	NA	2.2
In-migrants (no.)	138	5
Vacant housing[f] (no.)	69	5
Local community service employment		
Teachers (no.)	1	0
Physicians (no.)	0	0
Public safety (no.)	1	0

[a] Construction impacts are 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.

Operations impacts were based on full build-out of the site, producing a total output of 428 MW.

[b] Unless indicated otherwise, values are reported in $ million 2008. There is currently no individual income tax in Nevada.

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

[d] The BLM annual capacity payment was based on a fee of $6,570 per MW, established by the BLM in its Solar Energy Interim Rental Policy (BLM 2010b), 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 per MW.

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11.6.19.3 SEZ-Specific Design Features and Design Feature Effectiveness

No SEZ-specific design features addressing socioeconomic impacts have been identified for the Gold Point SEZ. Implementing the programmatic design features described in Appendix A, Section A.2.2, as required under BLM's Solar Energy Program, would reduce the potential for socioeconomic impacts during all project phases.

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11.6.20 Environmental Justice

11.6.20.1 Affected Environment

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," formally requires federal agencies to incorporate environmental justice as part of their missions (*Federal Register*, Volume 59, page 7629, 1994). Specifically, it directs them to address, as appropriate, any disproportionately high and adverse human health or environmental effects of their actions, programs, or policies on minority and low-income populations.

The analysis of the impacts of solar energy projects on environmental justice issues follows guidelines described in the CEQ's *Environmental Justice Guidance under the National Environmental Policy Act* (CEQ 1997). The analysis method has three parts: (1) a description of the geographic distribution of low-income and minority populations in the affected area is undertaken; (2) an assessment is conducted to determine whether construction and operation would produce impacts that are high and adverse; and (3) if impacts are high and adverse, a determination as to whether these impacts disproportionately affect minority and low-income populations.

Construction and operation of solar energy projects in the proposed SEZ could affect environmental justice if any adverse health and environmental impacts resulting from any phase of development are significantly high and if these impacts disproportionately affect minority and low-income populations. If the analysis determines that health and environmental impacts are not significant, there can be no disproportionate impacts on minority and low-income populations. In the event impacts are significant, disproportionality would be determined by comparing the proximity of any high and adverse impacts with the location of low-income and minority populations.

The analysis of environmental justice issues associated with the development of solar facilities considered impacts within the SEZ and an associated 50-mi (80-km) radius around the boundary of the SEZ. A description of the geographic distribution of minority and low-income groups in the affected area was based on demographic data from the 2000 Census (U.S. Bureau of the Census 2009j,k). The following definitions were used to define minority and low-income population groups:

- **Minority.** Persons who identify themselves as belonging to any of the following racial groups: (1) Hispanic, (2) Black (not of Hispanic origin) or African American, (3) American Indian or Alaska Native, (4) Asian, or (5) Native Hawaiian or Other Pacific Islander.

  Beginning with the 2000 Census, where appropriate, the census form allows individuals to designate multiple population group categories to reflect their ethnic or racial origin. In addition, persons who classify themselves as being of multiple racial origin may choose up to six racial groups as the basis of

their racial origins. The term minority includes all persons, including those classifying themselves in multiple racial categories, except those who classify themselves as not of Hispanic origin and as White or "Other Race" (U.S. Bureau of the Census 2009j).

The CEQ guidance proposed that minority populations should be identified where either (1) the minority population of the affected area exceeds 50% or (2) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis.

This PEIS applies both criteria in using the Census data for census block groups, wherein consideration is given to the minority population that is both greater than 50% and 20 percentage points higher than in the state (the reference geographic unit).

- **Low-Income.** Individuals who fall below the poverty line. The poverty line takes into account family size and age of individuals in the family. In 1999, for example, the poverty line for a family of five with three children below the age of 18 was $19,882. For any given family below the poverty line, all family members are considered as being below the poverty line for the purposes of analysis (U.S. Bureau of the Census 2009k).

The data in Table 11.6.20.1-1 show the minority and low-income composition of the total population located in the proposed SEZ based on 2000 Census data and CEQ guidelines. Individuals identifying themselves as Hispanic or Latino are included in the table as a separate entry. However, because Hispanics can be of any race, this number also includes individuals identifying themselves as being part of one or more of the population groups listed in the table.

Minority and low-income individuals are located in the 50-mi (80-km) area around the boundary of the SEZ. Within the 50-mi (80-km) radius in Nevada, 18.7% of the population is classified as minority, while 9.8% is classified as low-income. However, the number of minority individuals does not exceed 50% of the total population in the area and does not exceed the state average by 20 percentage points or more; thus, in aggregate, there is no minority population in the SEZ area based on 2000 Census data and CEQ guidelines. The number of low-income individuals does not exceed the state average by 20 percentage points or more and does not exceed 50% of the total population in the area; thus, in aggregate, there are no low-income populations in the Nevada portion of the SEZ area.

In the California portion of the 50-mi (80-km) radius, 14.6% of the population is classified as minority, while 11.9% is classified as low-income. The number of minority individuals does not exceed 50% of the total population in the area and does not exceed the state average by 20 percentage points or more; thus, in aggregate, there is no minority population in the California portion of the SEZ area based on 2000 Census data and CEQ guidelines. The number of low-income individuals does not exceed the state average by 20 percentage points or

TABLE 11.6.20.1-1 Minority and Low-Income Populations within the 50-mi (80-km) Radius Surrounding the Proposed Gold Point SEZ

Parameter	California	Nevada
Total population	3,800	4,966
White, non-Hispanic	3,089	4,243
Hispanic or Latino	391	370
Non-Hispanic or Latino minorities	320	353
One race	247	206
Black or African American	5	56
American Indian or Alaskan Native	207	96
Asian	21	27
Native Hawaiian or Other Pacific Islander	9	10
Some other race	5	17
Two or more races	73	147
Total minority	711	723
Low-income	372	589
Percentage minority	18.7	14.6
State percentage minority	53.3	34.8
Percentage low-income	9.8	11.9
State percentage low-income	14.2	10.5

Source: U.S. Bureau of the Census (2009j,k).

more and does not exceed 50% of the total population in the area; thus, in aggregate, there are no low-income populations in the SEZ area.

11.6.20.2 Impacts

Environmental justice concerns common to all utility-scale solar energy facilities are described in detail in Section 5.18. These impacts would be minimized through the implementation of the programmatic design features described in Appendix A, Section A.2.2, which address the underlying environmental impacts contributing to the concerns. The potentially relevant environmental impacts associated with solar facilities within the proposed SEZ include noise and dust during the construction; noise and EMF effects associated with operations; visual impacts of solar generation and auxiliary facilities, including transmission lines; access to land used for economic, cultural, or religious purposes; and effects on property values as areas of concern that might potentially affect minority and low-income populations.

Potential impacts 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, however, and there are no minority or low-income populations, as defined by CEQ guidelines (Section 11.6.20.1), within the 50-mi (80-km) radius around the boundary of the SEZ; this means that any adverse impacts of solar projects could not disproportionately affect minority or low-income populations.

11.6.20.3 SEZ-Specific Design Features and Design Feature Effectiveness

No SEZ-specific design features addressing environmental justice impacts have been identified for the proposed Gold Point SEZ. Implementing the programmatic design features described in Appendix A, Section A.2.2, as required under BLM's Solar Energy Program, would reduce the potential for environmental justice impacts during all project phases.

11.6.21 Transportation

The proposed Gold Point SEZ is accessible by road. One U.S. highway serves the immediate area. The nearest railroad access is about 160 mi (257 km) away. Four small airports serve the area within a drive of about 91 mi (146 km). General transportation considerations and impacts are discussed in Sections 3.4 and 5.19, respectively.

11.6.21.1 Affected Environment

U.S. 95 extends north to south as it passes within 9 mi (14 km) east of the proposed Gold Point SEZ, as shown in Figure 11.6.21.1-1. The small town of Tonopah is about 50 mi (80 km) north of the SEZ along U.S. 95. I-80 is about 250 mi (400 km) northwest of the SEZ at its closest approach. Southeast of the SEZ, U.S. 95 passes through Beatty, about 60 mi (97 km) away, on its way to the Las Vegas metropolitan area, a distance of about 180 mi (290 km) from the SEZ. As seen in Figure 11.6.21.1-1. State Route 266 passes along the northern edge of the SEZ at a distance of about 1.6 mi (2.6 km), connects with U.S. 95 to the east, and passes into California to the west. Access to the proposed Gold Point SEZ would be from State Route 774, which parallels the eastern edge of the SEZ as it extends from State Route 266 to Gold Point south of the SEZ. Some unimproved dirt roads are also in the area. The area is classified as open to vehicle use (BLM 1997). As listed in Table 11.6.21.1-1, State Routes 266 and 774 and U.S. 95 carry average traffic volumes of about 210, 20, and 2,000 vehicles per day, respectively, in the vicinity of the proposed Gold Point SEZ (NV DOT 2010).

The UP Railroad serves the region. A spur from the main line that crosses northern Nevada ends at Thorne (UP 2009), 160 mi (257 km) northwest of the SEZ along U.S. 95, immediately north of Hawthorne. Access to the UP Railroad is also available 180 mi (290 km) away in Las Vegas.

The nearest public airport is the Lida Junction Airport, a small BLM airport about 10 mi (16 km) from the proposed Gold Point SEZ at the junction of State Route 266 with U.S. 95. The airport has a single dirt runway in good condition, as listed in Table 11.6.21.1-2. A similar BLM-managed airport is 48 mi (77 km) away in Dyer. Other small airports are located in Tonopah, Nevada, and Bishop, California. None of these four airports has scheduled commercial passenger service or regular freight service, with the exception of the Sierra Regional Airport in Bishop, California, which has regular UPS freight service (Eastern Sierra Regional Airport 2010). In 2008, 72,724 lb (32,980 kg) of freight was shipped, and 289,323 lb (131,212 kg) of freight was received (BTS 2009). The nearest major airport to the proposed Gold Point SEZ is in Las Vegas.

11.6.21.2 Impacts

As discussed in Section 5.19, the primary transportation impacts are anticipated to be from commuting construction worker traffic. Single projects could involve up to 1,000 workers each day, with an additional 2,000 vehicle trips per day (maximum). The increase in the volume

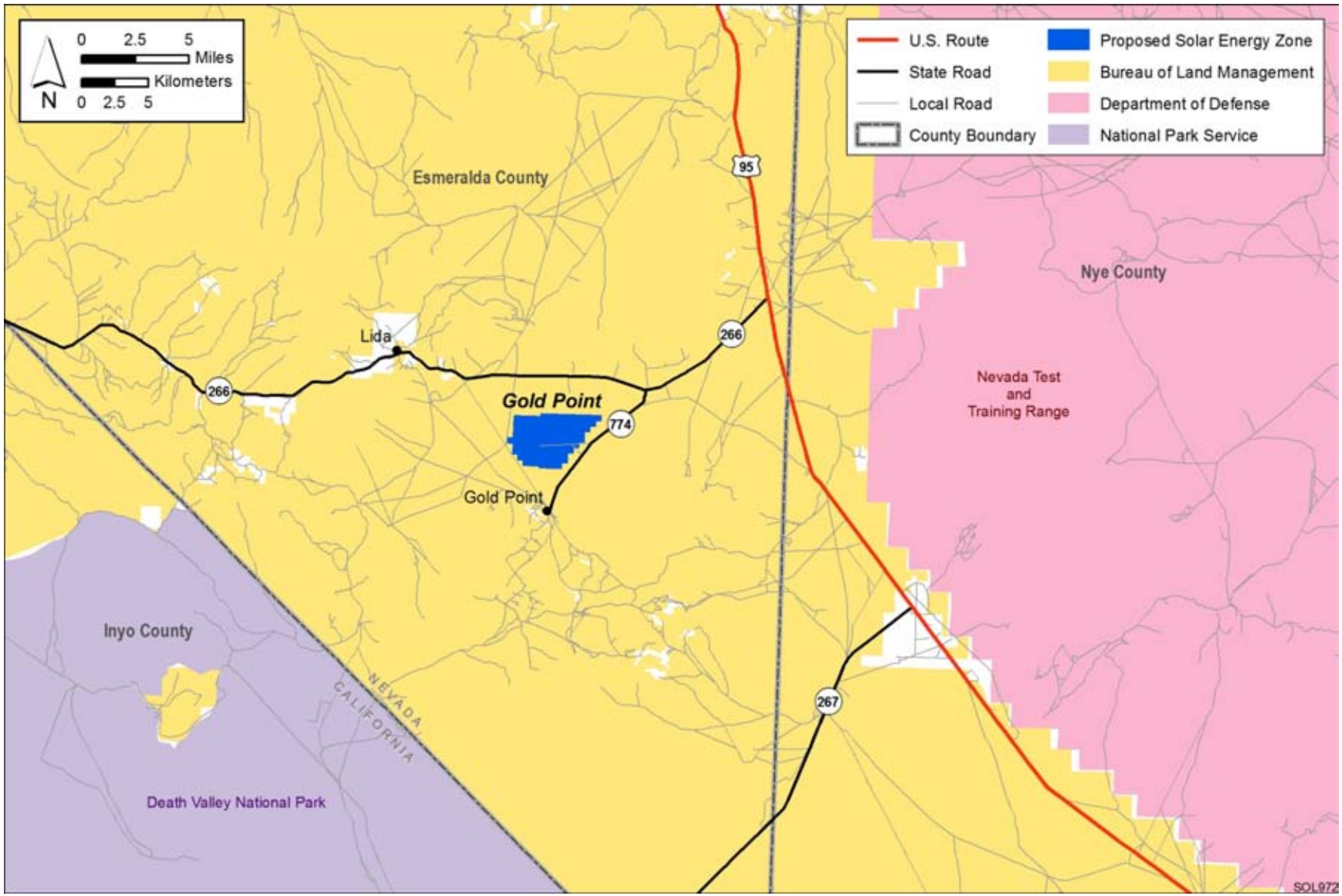

FIGURE 11.6.21.1-1 Local Transportation Network Serving the Proposed Gold Point SEZ

TABLE 11.6.21.1-1 AADT on Major Roads near the Proposed Gold Point SEZ for 2009

Road	General Direction	Location	AADT (Vehicles)
U.S. 6	East–west	East of Tonopah (west of State Route 376)	1,100
U.S. 95	Northwest–southeast	North of Tonopah, 13 mi (21 km) past the Nye/Esmeralda county line	1,900
		South of Tonopah	2,100
		South of Goldfield	2,000
		North of junction State Route 266	1,900
		South of junction State Route 266	2,000
		South of junction State Route 267 (about midway between State Route 267 and Beatty)	2,200
		North of Beatty	2,400
State Route 266	East–west	West of junction with U.S. 95	210
State Route 267	East–west	West of junction with U.S. 95	50
State Route 374	Northeast–southwest	West of Beatty and junction with U.S. 95	480
State Route 774 (Gold Point Road)	Northeast–southwest	South of junction with State Route 266	20

Source: NV DOT (2010).

TABLE 11.6.21.1-2 Airports Open to the Public in the Vicinity of the Proposed Gold Point SEZ

Airport	Location	Owner/Operator	Runway 1[a] Length (ft [m])	Runway 1[a] Type	Runway 1[a] Condition	Runway 2[a] Length (ft [m])	Runway 2[a] Type	Runway 2[a] Condition
Dyer	Southeast of Dyer, 48 mi (77 km) from the SEZ via State Route 266 to State Route 264	BLM	2,870 (875)	Dirt	Fair	NA[b]	NA	NA
Eastern Sierra Regional	West of the SEZ, in Bishop, Calif., a 91 mi (146 km) drive	City of Los Angeles/ Inyo County	5,567 (1,697)	Asphalt	Good	5,600 (1,707)	Asphalt/ Porous friction surfaces	Good
			7,498 (2,285)	Asphalt/ Porous friction surfaces	Good	NA	NA	NA
Lida Junction	About 10 mi (16 km) from the SEZ, at the junction State Route 266 with U.S. 95	U.S. BLM	6,100 (1,859)	Dirt	Good	NA	NA	NA
Tonopah	East of Tonopah, 58 mi (93 km) east of the SEZ on U.S. 6	Nye County	6,196 (1,889)	Asphalt	Good	7,161 (2,183)	Asphalt	Good

[a] Source: FAA (2009).

[b] NA = not applicable.

of traffic on U.S. 95 east of the proposed Gold Point SEZ, on State Route 266 past the northern border of the SEZ, and along State Route 744 along the eastern edge of the SEZ would represent increases in traffic of about 100%, 1,000%, and 10,000%, respectively. Also, higher traffic volumes would be experienced during shift changes. Thus, traffic on U.S. 95 could experience slowdowns during these periods in the vicinity of the junction with State Route 266, and local road improvements would be necessary on State Routes 266 and 774 so as not to overwhelm the local access roads near any site access points.

Solar development within the SEZ would affect public access along OHV routes designated open and available for public use. If there are any routes designated as open within the proposed SEZ, open routes crossing areas issued ROWs for solar facilities would be redesignated as closed (see Section 5.5.1 for more details on how routes coinciding with proposed solar facilities would be treated).

11.6.21.3 SEZ-Specific Design Features and Design Feature Effectiveness

No SEZ-specific design features have been identified related to impacts on transportation systems around the proposed Gold Point SEZ. The programmatic design features described in Appendix A, Section A.2.2, 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 site. Depending on the location of solar facilities within the SEZ, more specific access locations and local road improvements could be implemented.

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11.6.22 Cumulative Impacts

The analysis presented in this section addresses the potential cumulative impacts in the vicinity of the proposed Gold Point SEZ in Esmeralda County, Nevada. The CEQ guidelines for implementing NEPA define cumulative impacts as environmental impacts resulting from the incremental effects of an action when added to other past, present, and reasonably foreseeable future actions (40 CFR 1508.7). The impacts of other actions are considered without regard to the agency (federal or nonfederal), organization, or person that undertakes them. The time frame of this cumulative impacts assessment could appropriately include activities that would occur up to 20 years in the future (the general time frame for PEIS analyses), but little or no information is available for projects that could occur further than 5 to 10 years in the future.

The land surrounding the proposed Gold Point SEZ is undeveloped with several ghost towns and few permanent residents living in the area. The nearest population centers are the small communities of Goldfield, population 310, located 25 mi (40 km) northeast of the SEZ; Tonopah, population 1,500, located 45 mi (72 km) northeast of the SEZ; and Beatty, population 1,600, located approximately 45 mi (72 km) southeast of the SEZ. Death Valley NP in California is 10 mi (16 km) southwest of the SEZ. The NTTR is 12 mi (19 km) east of the SEZ, and the NTS is 45 mi (72 km) east of the SEZ. The Sylvania Mountains, Piper Mountain and White Mountains WAs are located within a 50-mi (80-km) radius of the SEZ in California.

The geographic extent of the cumulative impacts analysis for potentially affected resources near the Gold Point SEZ is identified in Section 11.6.22.1. An overview of ongoing and reasonably foreseeable future actions is presented in Section 11.6.22.2. General trends in population growth, energy demand, water availability, and climate change are discussed in Section 11.6.22.3. Cumulative impacts for each resource area are discussed in Section 11.6.22.4.

11.6.22.1 Geographic Extent of the Cumulative Impacts Analysis

The geographic extent of the cumulative impacts analysis for potentially affected resources evaluated near the Gold Point SEZ is provided in Table 11.6.22.1-1. These geographic areas define the boundaries encompassing potentially affected resources. Their extent may vary based on the nature of the resource being evaluated and the distance at which an impact may occur (e.g., air quality may have a greater regional extent of impact than visual resources). The BLM, the NPS, the DOE, and the DoD administer most of the land around the SEZ. The BLM administers approximately 47.3% of the lands within a 50-mi (80-km) radius of the SEZ.

11.6.22.2 Overview of Ongoing and Reasonably Foreseeable Future Actions

The future actions described below are those that are "reasonably foreseeable"; that is, they have already occurred, are ongoing, are funded for future implementation, or are included in firm near-term plans. Types of proposals with firm near-term plans are as follows:

- Proposals for which NEPA documents are in preparation or finalized;

TABLE 11.6.22.1-1 Geographic Extent of the Cumulative Impacts Analysis by Resource Area: Proposed Gold Point SEZ

Resource Area	Geographic Extent
Land Use	Southern Esmeralda County
Specially Designated Areas and Lands with Wilderness Characteristics	Within a 25-mi (40-km) radius of the Gold Point SEZ
Rangeland Resources	Southern Esmeralda County and Southwestern Nye County in Nevada and Western Inyo County in California
Grazing	Grazing allotments within 50 mi (80 km) of the Gold Point SEZ
Wild Horses and Burros	A 50-mi (80-km) radius from the center of the Gold Point SEZ
Recreation	Southern Esmeralda County and Southwestern Nye County in Nevada and Western Inyo County in California
Military and Civilian Aviation	Southern Nye County
Soil Resources	Areas within and adjacent to the Gold Point SEZ
Minerals	Southern Esmeralda County
Water Resources	
Surface Water	Jackson Wash and tributaries
Groundwater	Lida Valley groundwater basin
Air Quality and Climate	A 31-mi (50-km) radius from the center of the Gold Point SEZ
Vegetation, Wildlife and Aquatic Biota, Special Status Species	A 50-mi (80-km) radius from the center of the Gold Point SEZ, including portions of Esmeralda and Nye Counties in Nevada and Inyo County in California
Visual Resources	Viewshed within a 25-mi (40-km) radius of the Gold Point SEZ
Acoustic Environment (noise)	Areas adjacent to the Gold Point SEZ
Paleontological Resources	Areas within and adjacent to the Gold Point SEZ
Cultural Resources	Areas within and adjacent to the Gold Point SEZ for archaeological sites; viewshed within a 25-mi (40-km) radius of the Gold Point SEZ for other properties, such as traditional cultural properties
Native American Concerns	Areas within and adjacent to the Gold Point SEZ including the surrounding mountains; viewshed within a 25-mi (40-km) radius of the Gold Point SEZ
Socioeconomics	A 50-mi (80-km) radius from the center of the Gold Point SEZ
Environmental Justice	A 50-mi (80-km) radius from the center of the Gold Point SEZ
Transportation	U.S. 95, State Routes 266 and 774

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- Proposals in a detailed design phase;
- Proposals listed in formal NOIs published in the *Federal Register* or state publications;
- Proposals for which enabling legislation has been passed; and
- Proposals that have been submitted to federal, state, or county regulators to begin a permitting process.

Projects in the bidding or research phase or that have been put on hold were not included in the cumulative impact analysis.

The ongoing and reasonably foreseeable future actions described below are grouped into two categories: (1) actions that relate to renewable energy production and energy distribution, including potential solar energy projects under the proposed action (Section 11.6.22.2.1) and (2) other ongoing and reasonably foreseeable actions (Section 11.6.22.2.2). Together, these actions have the potential to affect human and environmental receptors within the geographic range of potential impacts over the next 20 years.

11.6.22.2.1 Energy Production and Distribution

On February 16, 2007, Governor Gibbons signed an Executive Order to encourage the development of renewable energy resources in Nevada (Gibbons 2007a). The Executive Order requires all relevant state agencies to review their permitting processes to ensure the timely and expeditious permitting of renewable energy projects. On May 9, 2007, and June 12, 2008, the Governor signed Executive Orders creating the Nevada Renewable Energy Transmission Access Advisory Committee Phase I and Phase II, which will propose recommendations for improved access to the grid system for renewable energy industries (Gibbons 2007b, 2008). On May 28, 2009, the Nevada Legislature passed Senate Bill 358, a bill modifying the Renewable Energy Portfolio Standards. The bill requires that 25% of the electricity sold be produced by renewable energy sources by 2025.

Renewable Energy and Energy Distribution Projects

Renewable energy applications are considered in two categories, fast-track and regular-track applications. Fast-track applications, which apply principally to solar and wind energy facilities, are those applications on public lands for which the environmental review and public participation process is under way and the applications could be approved by December 2010. A fast-track project would be considered foreseeable, because the permitting and environmental review processes would be under way. Regular-track proposals are considered potential future projects, but not necessarily foreseeable projects, since not all applications would be expected to be carried to completion.

No fast-track or other reasonably foreseeable future renewable energy or foreseeable energy distribution projects are within 50 mi (80 km) of the proposed Gold Point SEZ.

Pending Renewable Energy ROW Applications on BLM-Administered Lands

Applications for ROWs that have been submitted to the BLM include one pending solar project, one pending authorization for wind site testing, two authorized projects for wind site testing, and one authorized geothermal project that would be located within 50 mi (80 km) of the Gold Point SEZ. Table 11.6.22.2-1 lists these applications, and Figure 11.6.22.2-1 shows their locations.

There is a pending solar project that would be on private land about 49 mi (78 km) north of the Gold Point SEZ, about 1 mi (1.6 km) south of the Millers SEZ. In 2010, Altella Energy Corporation proposed to Esmeralda County the development of a 100-MW solar energy facility on private land near U.S. 6 and U.S. 95. The site is known as the Miller's Well site. The project's estimated cost is $500 million (Esmeralda County 2010a,b).

The likelihood of any of the regular-track application projects actually being developed is uncertain, but it is generally assumed to be less than that for fast-track applications. Potential projects listed in Table 11.6.22.2-1 give an indication of the level of interest in development of renewable energy in the region. Some number of these applications would be expected to result in actual projects. Thus, the cumulative impacts of these potential projects are analyzed in their potential aggregate effects.

Wind testing would involve some relatively minor activities that could have some environmental effects, mainly the erection of meteorological towers and monitoring of wind conditions. These towers may or may not employ guy wires and may be 200 ft (60 m) high.

11.6.22.2.2 Other Actions

Other major ongoing and foreseeable actions within 50 mi (80 km) of the proposed Gold Point SEZ are listed in Table 11.6.22.2-2 and described in the following sections.

Beatty Water and Sanitation District Water Treatment Plant. The Beatty Water and Sanitation District proposes to install a water treatment facility to remove arsenic from the drinking water supply for Beatty. The total disturbed area would be about 8.5 acres (0.034 km^2). The facility will include a septic tank leach field, backwash holding tank, and an evaporation/infilration basin (BLM 2009b).

Chemetall Foote Lithium Carbonate Facility Expansion. The DOE is proposing to upgrade an existing brine field production system, brine evaporation pond system, and lithium carbonate plant at the Chemetall Foote facility adjacent to the unincorporated town of Silver

TABLE 11.6.22.2-1 Pending Renewable Energy Project ROW Applications on BLM-Administered Land within 50 mi (80 km) of the Proposed Gold Point SEZ[a,b]

Serial Number	Applicant	Application Received	Size (acres)[c]	MW	Technology	Status	Field Office
Solar Applications							
NVN 83220	Cogentrix Solar Services	March 5, 2007	12,800	1,400	CSP	Pending	Pahrump
Wind Applications							
NVN 85746	Desert Research Institute	Aug. 1, 2008	28,428	–[d]	Wind	Pending wind site testing	Las Vegas
NVN 84067	AltaGas Renewable Energy	Aug. 30, 2007	7,360	–	Wind	Authorized wind site testing	Tonopah
NVN 87324	Pacific Wind Development	March 23, 2009	4,280	–	Wind	Authorized wind site testing	Tonopah
Geothermal Applications							
NVN 56347X	Fish Lake Power	–	47,769	–	Geothermal	Authorized	Tonopah

[a] BLM (2009a).

[b] Information for pending solar and pending wind (BLM and USFS 2010b) energy projects downloaded from GeoCommunicator.

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

[d] A dash indicates no data available.

FIGURE 11.6.22.2-1 Locations of Renewable Energy Project ROW Applications on Public Land within a 50-mi (80-km) Radius of the Proposed Gold Point SEZ

TABLE 11.6.22.2-2 Other Major Actions near the Proposed Gold Point SEZ[a]

Description	Status	Resources Affected	Primary Impact Location
Beatty Water and Sanitation District Water Treatment Plant	EA Nov. 2009	Drinking water	43 mi (69 km) southeast of the SEZ
Chemetall Foote Lithium Carbonate Facility Expansion	FEA issued Sept 2010	Terrestrial habitats, wildlife, air quality	25 mi (40 km) northwest of the SEZ
Mineral Ridge Project	Mining expected to resume 2011		28 mi (45 km) northwest of the SEZ
Caliente Rail Realignment	FEIS June 2008	Terrestrial habitats, wildlife, cultural resources	8 mi (13 km) northwest of the SEZ
120-kV Transmission Line	Operating	Disturbed areas, terrestrial habitats along transmission line ROW	Corridor passes from east to west–north of the SEZ
120-kV Transmission Line	Operating	Disturbed areas, terrestrial habitats along transmission line ROW	Corridor passes from north to south–north of the SEZ
Producing Geothermal Lease (NVN 8421)	Operating	Terrestrial habitats, wildlife	45 mi (72 km) northwest of the SEZ
Producing Geothermal Lease (NVN 8428)	Operating	Terrestrial habitats, wildlife	45 mi (72 km) northwest of the SEZ
Producing Geothermal Lease (NVN 9647)	Operating	Terrestrial habitats, wildlife	45 mi (72 km) northwest of the SEZ
Producing Geothermal Lease (NVN 31991)	Operating	Terrestrial habitats, wildlife	45 mi (72 km) northwest of the SEZ
Producing Geothermal Lease (NVN 31993)	Operating	Terrestrial habitats, wildlife	45 mi (72 km) northwest of the SEZ

[a] Projects ongoing or in later stages of agency environmental review and project development.

Peak, Nevada, and about 25 mi (40 km) northwest of the SEZ. The site is about 15,000 acres (61 km^2), mostly occupied by large evaporation ponds. The plant and administrative offices occupy approximately 20 acres (0.08 km^2). Existing lithium brine ponds would be expanded through recovering old ponds and rebuilding the dikes Construction of new brine production wells would require soil placement for drill pads (DOE 2010).

Mineral Ridge Project. Mineral Ridge, a formerly producing gold and silver mine, has both underground workings and open pits, with a 6-acre (0.024 km^2) deep leach operation and a high volume crusher plant. It is currently not operational but engineering work is being performed for future operations. It is anticipated that active mining will commence in 2011. The site is 3 mi (5 km) northwest of the unincorporated town of Silver Peak and approximately 28 mi (45 km) northwest of the SEZ. (Top Stock Picks 2010).

Caliente Rail Alignment. The DOE proposes to construct and operate a railroad for the shipment of spent nuclear fuel and high-level radioactive waste to the geologic repository at Yucca Mountain, Nevada. The rail line would begin near Caliente, Nevada, and extend north; then turn in a westerly direction, passing about 8 mi (13 km) northwest of the SEZ, to a location near the northwest corner of the NTTR (labeled Nellis Air Force Range in Figure 11.6.22.2-1); and then continue south–southwest to Yucca Mountain. The rail line would range in length from approximately 328 mi (528 km) to 336 mi (541 km), depending upon the exact location of the alignment and would be restricted to DOE shipments. Over a 50-year period, 9,500 casks containing spent nuclear fuel and high-level radioactive waste, and approximately 29,000 rail cars of other materials, including construction materials, would be shipped to the repository. An average of 17 one-way trains per week would travel along the rail line. Construction of support facilities—interchange yard, staging yard, maintenance-of-way facility, rail equipment maintenance yard, cask maintenance facility, and Nevada Rail Control Center and National Transportation Operation Center—would also be required. Construction would take 4 to 10 years and cost $2.57 billion. Construction activities would occur inside a 1000-ft (300-m) wide ROW for a total footprint of 40,600 acres (164 km^2) (DOE 2008).

Existing 120-kV Transmission Line. Sierra Pacific owns the two existing 120-kV transmission lines that run north to south and east to west, north of the SEZ (RETAAC 2007).

Existing Geothermal Leases. There is a small, contiguous, cluster of five producing geothermal leases located about 40 mi (64 km) northwest of the proposed SEZ, shown in Figure 11.6.22.2-1.

Grazing

There are no active grazing allotments in the immediate vicinity of the SEZ.

Mining

There are no foreseeable mining projects near the proposed SEZ.

11.6.22.3 General Trends

General trends of population growth, energy demand, water availability, and climate change for the proposed Gold Point SEZ are presented in this section. Table 11.6.22.3-1 lists the relevant impacting factors for the trends.

11.6.22.3.1 Population Growth

Over the period 2000 to 2008, the population grew annually by 3.9% in Nye County, but fell by 4.6% annually in sparsely populated Esmeralda County in Nevada, portions of which compose the ROI for the Gold Point SEZ. The annual growth rate for the State of Nevada as a whole was 3.4%. The population of the ROI in 2008 was 44,839 and is expected to increase to 78,122 by 2021 and to 80,872 by 2023 (Section 11.6.19.1.4).

11.6.22.3.2 Energy Demand

The growth in energy demand is related to population growth through increases in housing, commercial floorspace, transportation, manufacturing, and services. Given that population growth is expected in seven SEZ areas in Nevada between 2006 and 2016, an increase in energy demand is also expected. However, the EIA projects a decline in per-capita

TABLE 11.6.22.3-1 General Trends Relevant to the Proposed SEZs in Nevada

General Trend	Impacting Factors
Population growth	Urbanization Increased use of roads and traffic Land use modification Employment Education and training Increased resource use (e.g., water and energy) Tax revenue
Energy demand	Increased resource use Energy development (including alternative energy sources) Energy transmission and distribution
Water availability	Drought conditions and water loss Conservation practices Changes in water distribution
Climate change	Water cycle changes Increased wildland fires Habitat changes Changes in farming production and costs

energy use through 2030, mainly because of improvements in energy efficiency and the high cost of oil throughout the projection period. Primary energy consumption in the United States between 2007 and 2030 is expected to grow by about 0.5% each year, with the fastest growth projected for the commercial sector (at 1.1% each year). Transportation, residential, and industrial energy consumption are expected to grow by about 0.5, 0.4, and 0.1% each year, respectively (EIA 2009).

11.6.22.3.3 Water Availability

As described in Section 11.6.9.1.2, the proposed Gold Point SEZ is located in the Lida Valley groundwater basin. Estimated groundwater depth is 300 to 400 ft (91 to 122 m). Groundwater recharge estimates range up to 500 ac-ft/yr (616,700 m^3/yr) by precipitation and 200 ac-ft/yr (246,700 m^3/yr) by subsurface inflow. Groundwater discharge by outflow to the Sarcobatus Flat basin is estimated to be 700 ac-ft/yr (863,400 m^3/yr), while evapotranspiration is assumed to be negligible (Section 11.6.9.1.2).

In 2005, withdrawals from surface waters and groundwater in Esmeralda County were 46,786 million ac-ft/yr (57.7 million m^3/yr), of which 9% came from surface waters and 91% from groundwater. The largest water use categories for groundwater were irrigation and mining at 28,235 and 14,202 ac-ft/yr (34.8 million and 17.5 million m^3/yr), respectively.

Since the Lida Valley groundwater basin in not an NDWR-designated groundwater basin, there are no specified beneficial uses set by the NDWR. The perennial yield of the Lida Valley groundwater basin is set at 350 ac-ft/yr (431,700 m^3/yr), and current water rights total 76 ac-ft/yr (93,700 m^3/yr) for mining, stockwater, and municipal uses (Section 11.6.9.1.3).

11.6.22.3.4 Climate Change

Governor Jim Gibbons' Nevada Climate Change Advisory committee (NCCAC) conducted a study of climate change and its effects on Nevada (NCCAC 2008). The report summarized the present scientific understanding of climate change and its potential impacts on Nevada. A report on global climate change in the United States prepared by the U.S. Global Research Program (GCRP 2009) documents current temperature and precipitation conditions and historic trends. Excerpts of the conclusions from these reports follow.

- Precipitation will decrease, and a greater percentage of that precipitation will come from rain, resulting in a greater likelihood of winter and spring flooding and decreased stream flow in the summer.

- The average temperature in the Southwest has already increased by about 1.5ºF compared to a 1960 to 1979 baseline, and by the end of the century, the average annual temperature is projected to rise by 4ºF to 10ºF.

- A warming climate and a related reduction in spring snowpack and soil moisture have increased the length of the wildfire season and intensity of forest fires.

- Later snow and less snow coverage in ski resort areas could force ski areas to shut down before the season would otherwise end.

- Much of the Southwest has experienced drought conditions since 1999. This represents the most severe drought in the last 110 years. Projections indicate an increasing probability of drought in the region.

- As temperatures rise, landscape will be altered as species shift their ranges northward and upward to cooler climates.

- Temperature increases, when combined with urban heat island effects for major cities such as Las Vegas, present significant stress to health, electricity, and water supply.

- Increased minimum temperatures and warmer springs extend the range and lifetime of many pests that stress trees and crops, and lead to northward migration of weed species.

11.6.22.4 Cumulative Impacts on Resources

This section addresses potential cumulative impacts in the proposed Gold Point SEZ on the basis of the following assumptions: (1) because of the small size of the proposed SEZ (<10,000 acres [<40.5 km^2]), only one project could be constructed at a time, and (2) maximum total disturbance over 20 years would be about 3,848 acres (15.6 km^2) (80% of the entire proposed SEZ). For analysis, it is also assumed that no more than 3,000 acres (12.1 km^2) per project would be disturbed annually and 250 acres (1.01 km^2) monthly on the basis of construction schedules planned in current applications. An additional 667 acres (2.7 km^2) would be disturbed to construct a transmission line from the SEZ to the regional grid 22 mi (35 km) away. For site access, the nearest major road is State Route 774, which lies adjacent to the SEZ. It is assumed that no new access road would be constructed to support solar development in the SEZ.

Cumulative impacts that would result from the construction, operation, and decommissioning of solar energy development projects within the proposed SEZ when added to other past, present, and reasonably foreseeable future actions described in the previous section in each resource area are discussed below. At this stage of development, because of the uncertain nature of the future projects in terms of size, number, location within the proposed SEZ, and types of technology that would be employed, the impacts are discussed qualitatively or semi-quantitatively, with ranges given as appropriate. More detailed analyses of cumulative impacts would be performed in the environmental reviews for the specific projects in relation to all other existing and proposed projects in the geographic areas.

11.6.22.4.1 Lands and Realty

The proposed Gold Point SEZ is undeveloped and rural with only a few dirt roads present. There are no existing ROWs within the SEZ, but a designated Section 368b transmission corridor passes 6.5 mi (10 km) to the northeast, while a proposed local corridor would be located just west of the Section 368b corridor. The corridors are currently not utilized. As of February 2010, there were no ROW applications for solar energy facility development within the SEZ (Section 11.6.2.1).

Development of the SEZ for utility-scale solar energy production would establish a large industrial area that would exclude many existing and potential uses of the land, perhaps in perpetuity. Solar energy facilities would be a new and highly discordant land use to the area. However, as of February 2010, there were no ROW applications for solar energy facility development within the SEZ.

As presented in Section 11.6.22.2, no foreseeable renewable energy or transmission projects were identified within a 50-mi (80-km) radius of the proposed SEZ. The only foreseeable action is a water treatment plant in Beatty, Nevada, designed to remove arsenic from drinking water. In addition, one potential solar facility with a pending application covering 12,800 acres (52 km^2), one pending and two authorized wind site testing applications covering 40,068 acres (162 km^2), and one authorized geothermal application covering 47,769 acres (193 km^2) lie within this distance (Figure 11.6.22.2-1). Solar development within the proposed SEZ would require construction of a 22-mi (35-km) transmission line to the nearest existing line. Existing facilities within 50 mi (80 km) of the SEZ include two 120-kV transmission lines and a cluster of five producing geothermal leases about 45 mi (72 km) northwest. The seven pending renewable energy applications indicate moderate interest in renewable energy development in the region.

Given that the approved and pending renewable energy applications are widely dispersed—all are more than 15 mi (24 km) from the proposed SEZ—and although the size of the application ROWs typically far exceeds the amount of land that would be affected for other uses, total impacts on land use within the 50-mi (80-km) geographic extent of effects would be small. Development of utility-scale solar projects in the proposed Gold Point SEZ would not be expected to contribute significantly to cumulative impacts on lands and realty.

11.6.22.4.2 Specially Designated Areas and Lands with Wilderness Characteristics

There are nine specially designated areas within 25 mi (40 km) of the proposed Gold Point SEZ in Nevada and California (Section 11.6.3.1). Potential exists for cumulative visual impacts on these areas from the construction of utility-scale solar energy facilities within the SEZ and other projects outside the SEZ. The degree of cumulative impacts would depend on the number, type, and location of potential solar, wind, and geothermal projects with pending or approved applications within the geographic extent of effects that are actually built. Given the small number and wide geographic separation of such applications, potential cumulative impacts

on wilderness characteristics would be relatively small. No cumulative impacts would be expected from currently foreseeable actions in the region, however.

11.6.22.4.3 Rangeland Resources

The one very large grazing allotment that overlaps the proposed SEZ would be reduced by 0.7% of its total size (Section 11.6.4.1.2.1). Such a small reduction would not contribute to cumulative impacts on grazing.

Solar energy development within the SEZ would not directly affect wild horses and burros that are managed by the BLM or the USFS, while indirect impacts would be negligible with implementation of programmatic design features (Section 11.6.4.2.2). Thus, the SEZ would not contribute to cumulative impacts on these species.

11.6.22.4.4 Recreation

Little or no recreation occurs on the proposed Gold Point SEZ or along the route of the assumed transmission line. Construction of utility-scale solar projects on the SEZ would preclude recreational use of the affected lands for the duration of the projects. However, alternate routes exist nearby for any road closures within the relatively small proposed SEZ. Foreseeable and potential future actions would similarly affect areas of low recreational use and would have minimal effects on recreation. Thus, cumulative impacts on recreation within the geographic extent of effects are not expected.

11.6.22.4.5 Military and Civilian Aviation

The proposed Gold Point SEZ is located under numerous MTRs, is located between two MOAs, and lies within a mandatory DoD Consultation Area. Nellis Air Force Base and NTTR have expressed a variety of concerns over solar energy facilities being constructed within the Gold Point SEZ (Section 11.6.6.2). Foreseeable and potential solar, wind, and geothermal facilities and transmission lines could present additional concerns and result in cumulative impacts on military aviation. No impacts on civilian aviation are expected from solar facilities in the proposed SEZ.

11.6.22.4.6 Soil Resources

Ground-disturbing activities (e.g., grading, excavating, and drilling) during the construction phase of a solar project, including the construction of the associated transmission line and any new roads, would contribute to soil loss due to wind erosion and potential sedimentation of nearby washes and streams. Road use during construction, operations, and decommissioning of the solar facilities would further contribute to soil loss and siltation. Programmatic design features would be employed to minimize wind erosion, soil loss, and

stream sedimentation. Proposed renewable energy projects on the region with pending applications, if built, would be too far away to combine with soil impacts from the SEZ. Thus, with programmatic design features in place, cumulative impacts on soil resources near the proposed SEZ are not expected.

11.6.22.4.7 Minerals (Fluids, Solids, and Geothermal Resources)

As discussed in Section 11.6.8, there are currently no active oil and gas leases within the proposed Gold Point SEZ, and there are no mining claims or proposals for geothermal energy development pending in the SEZ. Because of the generally low level of mineral production in the area and the expected low impact on mineral accessibility of other foreseeable actions within the geographic extent of effects, no cumulative impacts on mineral resources are expected.

11.6.22.4.8 Water Resources

Section 11.6.9.2 describes the water requirements for various technologies if they were to be employed on the proposed SEZ to develop utility-scale solar energy facilities. The amount of water needed during the peak construction year for all evaluated solar technologies would be 1,182 to 1,707 ac-ft (1.5 million to 2.1 million m^3). During operations, with full development of the SEZ over 80% of its available land area, the amount of water needed for all evaluated solar technologies would range from 22 to 11,555 ac-ft/yr (27 thousand to 14 million m^3). The amount of water needed during decommissioning would be similar to or less than the amount used during construction. As discussed in Section 11.6.22.2.3, water withdrawals in 2005 in Esmeralda County were 46,786 ac-ft/yr (57.7 million m^3/yr), of which 9% came from surface waters and 91% came from groundwater. The largest water use categories for groundwater were irrigation and mining at 28,235 and 14,202 ac-ft/yr (34.8 million and 17.5 million m^3/yr), respectively. Therefore, cumulatively the additional water resources needed for solar facilities in the SEZ during operations would constitute from a very small (0.05%) to a large (24%) increment (the ratio of the annual operations water requirement to the annual amount withdrawn in Esmeralda County) depending on the solar technology used (PV technology at the low end and wet-cooled parabolic trough technology at the high end).

Near the SEZ, the perennial yield of the Lida Valley groundwater basin is set at 350 ac-ft/yr (431,700 m^3/yr), while current water rights total 76 ac-ft/yr (93,700 m^3/yr). Thus, solar facilities on the SEZ would have the capacity to overwhelm the specified groundwater yield in the local basin using wet-cooled technologies, while dry-cooled technologies could require three-times the specified yield. Full development with non-cooled dish engine technology would require up to 219 ac-ft/yr (0.27 million m^3/yr), or about 63%, and PV would require 22 ac-ft/yr (27 thousand m^3/yr), or about 6% of this level (Section 11.6.9.2.2).

While solar development of the proposed SEZ with water-intensive technologies would likely be infeasible because of impacts on groundwater supplies, excessive groundwater withdrawals could disrupt the existing groundwater supplies in the Lida Valley. In addition, land disturbance for solar facility construction could cause localized soil erosion and sedimentation of

ephemeral washes, degrade associated habitats in Jackson Wash, and alter groundwater recharge and discharge processes. Cumulative impacts on surface and groundwater resources are not expected, however, because of the absence of foreseeable development near the SEZ. Potential solar, wind, and geothermal projects are more than 15 mi (24 km) from the SEZ and would not likely affect the same water resources (Section 11.6.22.2).

Small quantities of sanitary wastewater would be generated during the construction and operation of the potential utility-scale solar energy facilities. The amount generated from solar facilities would range from 9 to 74 ac-ft (11 to 91 thousand m^3) during the peak construction year and from 1 up to 11 ac-ft/yr (up to 14,000 m^3/yr) during operations. Because of the small quantity, the sanitary wastewater generated by the solar energy facilities would not be expected to place undue strain on available sanitary wastewater treatment facilities in the general area of the SEZ. For technologies that rely on conventional wet-cooling systems, there would also be 121 to 219 ac-ft/yr (0.15 to 0.27 million m^3/yr) of blowdown water from cooling towers. Blowdown water would need to be either treated on-site or sent to an off-site facility. Any on-site treatment of wastewater would have to ensure that treatment ponds are effectively lined in order to prevent any groundwater contamination. Thus, blowdown water would not contribute to cumulative effects on treatment systems or on groundwater.

11.6.22.4.9 Vegetation

The proposed Gold Point SEZ is located within the Tonopah Basin ecoregion, which supports sparse shadscale communities. Inter-Mountain Basins Mixed Salt Desert Scrub is the predominant cover type within the proposed SEZ. Sensitive habitats on the SEZ include riparian, desert dry wash, and playa habitats. The area surrounding the SEZ consists of a mosaic of the Tonopah Basin and the Tonopah Sagebrush Foothills ecoregion. The dominant cover type in the 5-mi (8-km) area of indirect effects is Inter-Mountain Basins Mixed Salt Desert Scrub. There are no NWI-mapped wetlands within the SEZ or in the area of indirect effects. Ephemeral washes in the SEZ drain to Jackson Wash, which supports riparian communities downstream. If utility-scale solar energy projects were to be constructed within the SEZ, all vegetation within the footprints of the facilities would likely be removed during land-clearing and land-grading operations. Full development of the SEZ over 80% of its area would result in small impacts on all cover types in the affected area (Section 11.6.10.2.1). Site-clearing and -grading could disrupt surface water flow patterns and potentially alter plant communities in riparian or playa habitats within or outside of the SEZ, while increased runoff from facilities could affect the hydrology of these areas. In addition, groundwater drawdown by solar facilities could affect wetland communities associated with springs. A further concern in disturbed areas is the establishment and spread of noxious weeds and invasive species.

The fugitive dust generated during the construction of the solar facilities could increase the dust loading in habitats outside a solar project area, in combination with that from other dust sources. The cumulative dust loading could result in reduced productivity or changes in plant community composition. Similarly, surface runoff from project areas after heavy rains could increase sedimentation and siltation in areas downstream. Programmatic design features would

be used to reduce the impacts from solar energy projects and thus reduce the overall cumulative impacts on plant communities and habitats.

Solar facilities within the SEZ would not be expected to contribute to cumulative effects on vegetation within the 50-mi (80-km) geographic extent of effects because of the absence of foreseeable development outside the SEZ and long distances to potential renewable energy projects. Of the seven renewable energy applications, only one is for a solar facility and it lies almost 50 mi (80 km) from the SEZ. Wind and geothermal applications, which lie as close as 16 mi (26 km), would general disturb far less land than a solar facility.

11.6.22.4.10 Wildlife and Aquatic Biota

Wildlife species that could potentially be affected by the development of utility-scale solar energy facilities in the proposed SEZ include amphibians, reptiles, birds, and mammals. The construction of utility-scale solar energy projects in the SEZ and any associated transmission lines and roads in or near the SEZ would have an impact on wildlife through habitat disturbance (i.e., habitat reduction, fragmentation, and alteration), wildlife disturbance, and wildlife injury or mortality. In general, species with broad distributions and a variety of habitats would be less affected than species with a narrowly defined habitat within a restricted area. The use of programmatic design features would reduce the severity of impacts on wildlife. These design features may include pre-disturbance biological surveys to identify key habitat areas used by wildlife, followed by avoidance or minimization of disturbance to those habitats.

As noted in Section 11.6.22.2, few foreseeable or potential future actions lie within 50 mi (80 km) of the proposed SEZ (Section 11.6.22.2). While impacts from full build-out over 80% of the proposed SEZ would result in small impacts on amphibian, reptile, bird, and mammal species (Section 11.6.11), cumulative impacts from foreseeable development within the 50-mi (80-km) geographic extent of effects are not expected. Many of the wildlife species within the proposed SEZ that could be affected by other actions would still have extensive habitat available within the region, while regional impacts from solar facilities within the proposed SEZ would be small due to its modest size.

No perennial streams or water bodies are present in the proposed Gold Point SEZ or within the area of direct effects, including the area associated with the proposed new transmission line corridor. Ephemeral streams flow primarily after rainfall and typically do not support wetland or riparian habitats or flow into perennial surface waters. No NWI-mapped wetlands are present within the SEZ or within the area of indirect effects. Within the 50-mi (80-km) geographic extent of effects, the nearest permanent surface water is more than 14 mi (22 km) from the SEZ (Section 11.6.11.4). Soil disturbance from construction of solar facilities in the SEZ could result in soil transport to surface streams via water and airborne routes, but is expected to be low with mitigations in place and is not expected to affect any perennial water body. However, groundwater drawdown by operating solar facilities within the SEZ might affect water levels on off-site streams and wetlands. Since development of the SEZ is not expected to affect aquatic habitats, it would not contribute to cumulative impacts on such habitats. Impacts

from other ongoing and foreseeable development within the 50-mi (80-km) geographic extent of effects would be small, given the low level of identified development.

11.6.22.4.11 Special Status Species (Threatened, Endangered, Sensitive, and Rare Species)

On the basis of recorded occurrences in the region or suitable habitat, as many as 21 special status species could occur within the proposed Gold Point SEZ. However, no special status species are known to occur within the affected area of the SEZ, and no groundwater-dependent species are known to occur in the vicinity of the SEZ. Special status species that could occur on or in the vicinity of the SEZ include species listed as threatened or endangered in the ESA, listed as protected or sensitive species by the State of Nevada, or listed as a sensitive species by the BLM (Section 11.6.12.1). Potential design features to be used to reduce or eliminate the potential for effects on these species from the construction and operation of utility-scale solar energy projects in the SEZ and related facilities (e.g., access roads and transmission line connections) outside the SEZ include avoidance of habitat and minimization of erosion, sedimentation, and dust deposition. Special status species are also affected by ongoing actions within the 50-mi (80-km) geographic extent of effects, including roads, transmission lines, recreation, and activities at the NTTR. Future facilities would add further effects, including those from one potential solar facility with a pending application covering 12,800 acres (52 km^2), one pending and two authorized wind site testing applications covering 40,068 acres (162 km^2), and one authorized geothermal applications covering 47,769 acres (193 km^2) (Section 11.6.22.2). Although individual facilities would cover large areas and long linear distances and because only a small number of potential actions and no foreseeable actions have been identified, cumulative impacts on special status species within the geographic extent of effects are expected to be small. Future projects would employ mitigation measures to limit effects.

11.6.22.4.12 Air Quality and Climate

While solar energy generates minimal emissions compared with fossil fuels, the site preparation and construction activities associated with solar energy facilities would be responsible for some amount of air pollutants. Most of the emissions would be particulate matter (fugitive dust) and emissions from vehicles and construction equipment. When these emissions are combined with those from other nearby projects outside the proposed SEZ or when they are added to natural dust generation from winds and windstorms, the air quality in the general vicinity of the projects could be temporarily degraded. For example, the maximum 24-hour PM_{10} concentration at or near the SEZ boundaries could at times exceed the applicable standard of 150 $\mu g/m^3$. The dust generated by the construction activities can be controlled by implementing aggressive dust control measures, such as increased watering frequency or road paving or treatment.

Because operation of solar facilities within the proposed SEZ would produce no or minimal contributions of combustion emissions, the only air pollutant of concern is dust generated during construction of new facilities, in addition to that produced by winds. Because

there are relatively few other foreseeable or potential actions that could produce fugitive dust emissions near the SEZ, it is unlikely that construction of two or more projects would overlap in both time and affected area and produce cumulative air quality effects due to dust emissions.

Over the long term and across the region, the development of solar energy may have beneficial cumulative impacts on air quality and atmospheric values by offsetting the need for energy production that results in higher levels of emissions, such as coal, oil, and natural gas. As discussed in Section 11.6.13.2.2, air emissions from operating solar energy facilities are relatively minor, while the displacement of criteria air pollutants, VOCs, TAPs, and GHG emissions currently produced from fossil fuels could be significant. For example, if the relatively small Gold Point SEZ were fully developed (80% of its acreage) with solar facilities, the quantity of pollutants avoided could be as large as 3.6% of all emissions from current electric power systems in Nevada.

11.6.22.4.13 Visual Resources

The proposed Gold Point SEZ is located within Lida Valley in Esmeralda County in southwestern Nevada. The SEZ is flat to slightly sloping, has a strong horizon line, and is surrounded by mountain ranges. The area is rural with few cultural modifications visible; however, roads, transmission lines, and the very small community of Gold Point are visible near the SEZ (Section 11.6.14.1).

Construction of utility-scale solar facilities in the SEZ would substantially alter the natural scenic quality of the area. Other potential renewable energy projects would cumulatively affect the visual resources in the region. Because of the large size of utility-scale solar energy facilities and the generally flat, open nature of the proposed SEZ, some lands outside the SEZ would also be subjected to visual impacts related to the construction, operation, and decommissioning of utility-scale solar energy facilities. Potential impacts would include night sky pollution, including increased skyglow, light spillage, and glare.

Visual impacts resulting from solar energy development within the SEZ would be in addition to impacts caused by other potential projects in the area. There currently is one wind project with an authorized application for wind testing on public land within the 25-mi (40-km) geographic extent for visual impacts (Figure 11.6.22.2-1). There are no currently foreseeable projects within this distance, however (Section 11.6.22.2). While the contribution of potential projects to cumulative visual impacts would depend on the location of facilities that are actually built, it may be concluded that small cumulative visual impacts could result from the presence of potential facilities. Because of the topography of the region such facilities, located in basin flats, would be visible at great distances from surrounding mountains, which include sensitive viewsheds, including in Death Valley National Park. Given the low number and wide separation of current proposals, few viewing locations would be affected by two or more facilities. However, facilities would be located near roads and thus would be viewable by motorists, who would also be viewing transmission lines, towns, and other infrastructure, as well as the road system itself.

As additional facilities are added, multiple projects might be viewed in succession, as viewers move through the landscape, for example, by driving on local roads. In general, however, the small number of potential new facilities would be expected to result in small cumulative visual impacts within the geographic extent of effects.

11.6.22.4.14 Acoustic Environment

The areas around the proposed Gold Point SEZ are relatively quiet. The existing noise sources around the SEZ include road traffic, aircraft flyover, cattle grazing, and recreational activities. The construction of solar energy facilities could increase the noise levels periodically for up to 3 years per facility, but there would be little or minor noise impacts during operation of solar facilities, except from solar dish engine facilities and from parabolic trough or power tower facilities using TES, that could affect nearby residences.

Other ongoing and reasonably foreseeable and potential future activities in the general vicinity of the SEZ are described in Section 11.6.22.2. Because the residences nearest to the SEZ in Gold Point are relatively far from other potential projects with respect to noise impacts, cumulative noise effects during the construction or operation of solar facilities are unlikely.

11.6.22.4.15 Paleontological Resources

The proposed Gold Point SEZ has low potential for the occurrence of significant fossil material over all its area, which is covered with thick alluvial deposits. The potential for the occurrence of paleontological resources in some portions of the route of the assumed 22-mi (35-km) long new transmission line is unknown (Section 11.6.16.1). While impacts on significant paleontological resources are unlikely to occur in the SEZ, a review of the geological deposits in the specific sites selected for future projects would be needed to determine whether a paleontological survey was warranted. Any paleontological resources encountered would be mitigated to the extent possible. No significant contributions to cumulative impacts on paleontological resources are expected.

11.6.22.4.16 Cultural Resources

The area around Gold Point is rich in cultural history, with settlements dating as far back as 12,000 years. The area covered by the proposed Gold Point SEZ has the potential to contain significant cultural resources, especially related to the mining industry. Visual impacts are possible to the NRHP-eligible Gold Point Town Site. Areas with high potential for containing archaeological sites also lie along the assumed route of the transmission line. While no surveys have been conducted within the SEZ boundaries, 18 surveys have been conducted within the 5-mi (8-km) area of indirect effects, recording 12 cultural resources (Section 11.6.17.1). It is possible that the development of utility-scale solar energy projects in the SEZ and the associated transmission line could contribute to cumulative impacts on cultural resources in the region. While any future solar projects would disturb large areas, the specific sites selected would be

surveyed; historic properties encountered would be avoided or mitigated to the extent possible. Through ongoing consultation with the Nevada SHPO and appropriate Native American governments, it is likely that most adverse effects on significant resources in the region could be mitigated to some degree. It is unlikely that any sites recorded in the SEZ or along the transmission line would be of such individual significance that, if properly mitigated, development would cumulatively cause an irretrievable loss of information about a significant resource type, but this would depend on the results of the future surveys and evaluations. Visual impacts from the transmission lines are possible on the Goldfield Historic District and, depending on the actual location of the line and the importance of the visual setting for that property, solar development could result in cumulative impacts on the district.

11.6.22.4.17 Native American Concerns

To date, no specific concerns have been raised to the BLM regarding the proposed Gold Point SEZ; however the development of utility-scale solar facilities in the proposed SEZ might cumulatively affect resources important to Native Americans. In comments on the scope of this PEIS, the Big Pine Paiute Tribe of the Owens Valley recommended that the BLM preserve undisturbed lands intact and that recently disturbed lands be given primary consideration for solar energy development. Such concerns would similarly apply to other future projects outside the proposed SEZ. Potential impacts on existing water supplies and springs in the Lida Valley from groundwater drawdown by solar energy facilities would be of further concern to local Tribes, as would impacts on important game and plant species and on visual resources (Section 11.6.18.2). Continued discussions with the area Tribes through government-to-government consultation are necessary to effectively consider and address the Tribes' concern tied to solar energy development in the Gold Point SEZ.

11.6.22.4.18 Socioeconomics

Solar energy development projects in the proposed Gold Point SEZ could cumulatively contribute to socioeconomic effects in the immediate vicinity of the SEZ and in the surrounding ROI. The effects could be positive (e.g., creation of jobs and generation of extra income, increased revenues to local governmental organizations through additional taxes paid by the developers and workers) or negative (e.g., added strain on social institutions such as schools, police protection, and health care facilities). Impacts from solar development would be most intense during facility construction, but of greatest duration during operations. Construction would temporarily increase the number of workers in the area needing housing and services in combination with temporary workers involved in other new projects in the area, including other renewable energy development. The number of workers involved in the construction of solar projects (including the transmission lines) in the peak construction year could range from about 170 to 1,600 depending on the technology being employed, with solar PV facilities at the low end and solar trough facilities at the high end. The total number of jobs created in the area could range from approximately 220 (solar PV) to as high as 2,300 (solar trough). Cumulative socioeconomic effects in the ROI from construction of solar facilities would occur to the extent that multiple construction projects of any type were ongoing at the same time. It is a reasonable

expectation that this condition would occur within a 50-mi (80-km) radius of the SEZ occasionally over the 20-year or more solar development period.

Annual impacts during the operation of solar facilities would be less, but of 20- to 30-year duration, and could combine with those from other new facilities in the area, including several potential solar, wind, and geothermal energy projects (Section 11.6.22.2). The number of workers needed at the SEZ solar facilities would range from 8 to 120 with approximately 10 to 170 total jobs created in the region, assuming full build-out of the SEZ (Section 11.6.19.2.2). Population increases would contribute to general upward trends in the region in recent years. The socioeconomic impacts overall would be positive, through the creation of additional jobs and income. The negative impacts, including some short-term disruption of rural community quality of life, would not likely be considered large enough to require specific mitigation measures.

11.6.22.4.19 Environmental Justice

Any impacts from solar development could have cumulative effects on minority and low-income populations within 50 mi (80 km) of the proposed SEZ in combination with other development in the area. Such impacts could be both positive, such as from increased economic activity, and negative, such as from visual degradation, noise, and exposure to fugitive dust. Actual impacts would depend on where low-income populations are located relative to solar and other proposed facilities and on the geographic range of effects. Overall, effects from facilities within the SEZ are expected to be small, while other foreseeable and potential actions could contribute additional small effects on minority and low-income populations. However, most other potential actions, mainly renewable energy projects, are more than 25 mi (40 km) from the proposed SEZ, while no minority or low-income populations are currently present within the 50-mi (80-km) ROI (Section 11.6.20.1). While future minority and low-income populations, if present, could experience small cumulative effects of some types, such as on visual resources or from fugitive dust, from all actions within the geographic extent of effects, contributions from solar development in the proposed Gold Point SEZ would be small. If needed, mitigation measures can be employed to reduce the impacts on these populations in the vicinity of the SEZ.

11.6.22.4.20 Transportation

U.S. 95 is the nearest major road and lies about 9 mi (14 km) east of the proposed Gold Point SEZ. The Las Vegas metropolitan area lies approximately 180 mi (290 km) southeast of the SEZ along U.S. 95. Access to the Gold Point SEZ would be from State Route 774, which parallels the eastern edge of the SEZ. This road intersects State Route 266 to the north, which, in turn, intersects U.S. 95 to the east. None of the local airports has scheduled commercial passenger service; the largest major airport is in Las Vegas. The closest railroad access is 160 mi (257 km) northwest of the SEZ, north of Hawthorne. During construction of utility-scale solar energy facilities, up to 1,000 workers could be commuting to the construction site at the SEZ, which could increase the AADT on these roads by 2,000 vehicle trips for each facility under construction. With a single solar facility assumed to be under construction at a given time, traffic on all affected roads could experience slowdowns at access points near the SEZ

(Section 11.6.21.2). Construction worker traffic could likewise have minor cumulative impacts on traffic flow in combination with existing traffic levels and potential increases from additional future facilities in the vicinity of the proposed SEZ should project schedules overlap. Local road improvements may be necessary on affected roads near access to the SEZ. Any impacts during construction activities would be temporary. The impacts can also be mitigated to some degree by staggered work schedules and ride-sharing programs. Traffic increases during operation would be relatively small because of the low number of workers needed to operate the solar facilities and would have little contribution to cumulative impacts.

11.6.23 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 PEIS. It is likely that at the time of publication of this 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 PEIS.

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