
CHAPTER 3 – AFFECTED ENVIRONMENT

This chapter describes the affected environment associated with the construction, operation, maintenance and decommissioning of the proposed Silver State Solar South Project and the BLM's proposed amendment to the LVFO RMP. For the most part, the affected environment analyzed in the Supplemental EIS is the same area analyzed in the 2010 Final EIS. The Supplemental EIS assesses the environmental impacts of adding 5,571 acres of new ROW application area to 7,387 acres of the ROW application area that were analyzed in the 2010 Final EIS, as well as different configurations of the project footprint and facilities. Changes in the baseline conditions in the area include the introduction of the nearly complete 50 MW Silver State Solar North Project into the landscape.

Geographic Setting

The proposed Silver State Solar South Project would be located in the Ivanpah Valley within southwestern Nevada in an unincorporated portion of Clark County, approximately 40 miles south of Las Vegas, and approximately 2 miles east of Primm. The 12,958-acre ROW application area is bounded to the east by the Lucy Gray Mountains, to the west by the NV Energy Walter M. Higgins Generating Station and the Union Pacific Railroad, to the north by undeveloped BLM land, and to the southwest by the California state line. The proposed footprint of the facilities and anything that lies within the boundaries of this footprint (hereafter referred to as the Project Area) would occupy between 2,500 acres and 3,900 acres in size depending upon the alternative chosen and final site configuration. If approved, the remaining acreage within the larger ROW application area would be relinquished and the ROW grant would only be issued for lands needed for project development. The ACEC under consideration (refer to Section 2.3.5) encompasses 40,180 acres that extend to the north and southeast of the ROW application area and include portions of eastern Ivanpah Valley, the Lucy Gray Mountains, and the Sheep Mountains (Figure 2-6).

Resource Values and Uses Brought Forward for Analysis

For this Supplemental EIS analysis, the following resources and uses are brought forward for analysis and presented in this chapter.

- Section 3.1 – Air Quality and Climate
- Section 3.2 – Noise
- Section 3.3 – Geology, Topography, and Geologic Hazards
- Section 3.4 – Soils
- Section 3.5 – Water Resources/Hydrology
- Section 3.6 – Biological Resources
- Section 3.7 – Cultural Resources
- Section 3.8 – Paleontological Resources
- Section 3.9 – Lands and Realty
- Section 3.10 – Special Management Areas
- Section 3.11 – Recreation
- Section 3.12 – Visual Resources

- Section 3.13 – Transportation/Motorized Vehicle Access
- Section 3.14 – Human Health and Safety/Hazardous Materials
- Section 3.15 – Social and Economic Conditions
- Section 3.16 – Environmental Justice
- Section 3.17 – Energy and Minerals
- Section 3.18 – Fuels and Fire Management

The information in this chapter tiers to the 2010 Final EIS and is based on existing and supplementary resource data. Extensive environmental site review was conducted between 2008 and 2010 to evaluate the environmental conditions and potential impacts from construction and operation of the Silver State Solar Energy Project that was analyzed in the 2010 Final EIS. The Applicant has conducted additional surveys in the 5,571-acre supplemental ROW application area to refine the project footprint and avoid environmentally sensitive areas. The studies and reports prepared to date for the 2010 Final EIS and Supplemental EIS include:

- Desert Tortoise Presence/Absence Survey Report (originally submitted to the BLM in 2008 and revised to address additional survey area in October 2009)
- Botanical Habitat Assessment (October 2009)
- Biological Assessment (November 2009)
- Cultural Resources Report (November 2009)
- Paleontological Resources Assessment (November 2009)
- Visual Resources Report (November 2009)
- Delineation of Waters and Wetlands of the U.S. Report (October 2009)
- Spring 2010 Botanical Survey Report (May 2010)
- Desert Tortoise Phase I Area Survey (June 2010)
- Desert Tortoise Relocation Plan (September 2010)
- Cultural Resource Report for Silver State Solar Project (2010)
- Cultural Resource Report for Silver State Solar South Project (2011)
- Biological Resources Technical Report (May 2012)
- Supplemental EIS Visual Resource Analysis (May 2012)

These reports and studies have been incorporated by reference and are cited where used in this document. Copies are available and on file at the BLM Las Vegas Field Office.

3.1 AIR QUALITY AND CLIMATE

The climate and existing air quality in the regional area and the Silver State Solar Project study area are described in Section 3.1 in the 2010 Final EIS (BLM 2010). The Region of Influence (ROI) for air quality described in the 2010 Final EIS encompassed Hydrographic Basins 164A (Ivanpah Valley North) and 164B (Ivanpah Valley South). The same ROI applies to the Silver State Solar South Project analyzed in this Supplemental EIS, and the description of the Affected Environment presented in the 2010 Final EIS is incorporated by reference. A summary of the Affected Environment description from the 2010 Final EIS is presented below.

3.1.1 Air Quality

Nevada is divided into different hydrographic areas, which are used to define local “airsheds.” In Clark County, air quality status is typically defined for these local airsheds as opposed to the county as a whole. Hydrographic Areas 164A and 164B, which comprise the ROI for the proposed project, are designated by the USEPA, in accordance with CAA regulations, as non-attainment for ozone (O₃). Area sources include commercial, small-scale industrial, and residential sources with emissions that typically fall below point source reporting levels and that are too numerous or too small to identify individually. Though emissions from individual area sources are often relatively small, collectively their emissions can be of concern, particularly where large numbers of sources are located in heavily populated areas.

In addition, wind-blown fugitive dust, as a result of local/ regional naturally occurring and man-made activities, is a widespread issue in the arid and semi-arid regions of Southern Nevada. Following disturbance by naturally occurring wind events, construction, industrial, agricultural, and/or recreational activities, desert lands are subject to wind-driven emissions of fugitive dust. Soil-derived particles and other particulate emissions can obstruct visibility, cause property damage, and contribute to violations of air quality standards for fine particles. The Clark County Department of Air Quality (DAQ) has jurisdiction and is the compliance oversight for air quality in Clark County. All developers must implement dust control measures to reduce fugitive dust emissions during construction, as well as manage fugitive dust and other emissions from operations through the life of the project.

3.1.2 Greenhouse Gases and Climate Change

On-going scientific research has identified the potential impacts of so-called “greenhouse gas” (GHG) emissions (including carbon dioxide, CO₂; methane; nitrous oxide; water vapor; and several trace gasses) on global climate. Through complex interactions on a regional and global scale, these GHG emissions cause a net warming effect of the atmosphere (making surface temperatures suitable for life on Earth), primarily by decreasing the amount of heat energy radiated by the Earth back into space. Although GHG levels have varied for millennia (along with corresponding variations in climatic conditions), recent industrialization and burning of fossil carbon sources have caused CO₂ concentrations to increase dramatically, and are likely to contribute to overall climatic changes, typically referred to as global warming. Increasing CO₂ concentrations also lead to preferential fertilization and growth of specific plant species.

Global mean surface temperatures have increased nearly 1.0°C (1.8°F) from 1890 to 2006 (Goddard Institute for Space Studies, 2007). However, observations and predictive models indicate that average temperature changes are likely to be greater in the Northern Hemisphere. Figure 1 demonstrates that northern latitudes (above 24° N) have exhibited temperature increases of nearly 1.2°C (2.1°F) since 1900, with nearly a 1.0°C (1.8°F) increase since 1970 alone. Without additional meteorological monitoring systems, it is difficult to determine the spatial and temporal variability and change of climatic conditions, but increasing concentrations of GHG are likely to accelerate the rate of climate change.

In 2001, the IPCC indicated that by the year 2100, global average surface temperatures would increase 1.4 to 5.8°C (2.5 to 10.4°F) above 1990 levels. The National Academy of Sciences

(2006) has confirmed these findings, but also indicated that there are uncertainties regarding how climate change may affect different regions. Computer model predictions indicate that increases in temperature will not be equally distributed, but are likely to be accentuated at higher latitudes. Warming during the winter months is expected to be greater than during the summer, and increases in daily minimum temperatures is more likely than increases in daily maximum temperatures.

Active tracking photovoltaic solar energy systems do not directly generate GHG emissions, but the equipment manufacturing process does emit GHGs. In addition, on-site construction and operations using combustion engines can specifically generate CO₂ and methane, although at levels much lower than equivalent coal, oil, or natural gas-fired electrical generation facilities.

The United States Department of Interior (DOI), Secretary of Interior Order Number 3289, made effective September 14, 2009, establishes a Department-wide approach for applying scientific tools to increase understanding of climate change and to coordinate an effective response to its impacts on tribes, land, water, ocean, fish and wildlife, and cultural heritage resources that the Department manages.

Currently, there are no emission limits for GHG, and no technically defensible methodology for predicting potential climate changes from GHG emissions. However, there are and will continue to be several efforts to address GHG emissions from Federal activities.

The principal sources of Nevada's GHG emissions are electricity use (which excludes electricity exports to other states) and transportation, accounting for 42 percent and 32 percent of Nevada's gross GHG emissions, respectively. The next largest contributor to emissions is the residential, commercial, and industrial fuel use sector, accounting for 13 percent of the total State emissions (NCCAC 2008).

According to the Nevada Climate Change Advisory Committee (NCCAC) Final Report (NCCAC 2008), the predicted changes in the climate would impact public health through: (1) the direct effects of heat and frequent heat waves; (2) exacerbated air pollution as increased ground level O₃; (3) increases in infectious diseases, such as dengue fever and malaria; and (4) a decrease in general public health due to economic/social changes from climate change.

3.2 NOISE

Ambient noise levels within and adjacent to the ROW application area for the Silver State Solar Project were described in *Section 3.2* in the 2010 Final EIS (BLM 2010). The ROI described in the 2010 Final EIS encompassed the ROW application area adjacent to the California/Nevada border in an unincorporated portion of Clark County, Nevada, approximately 40 miles south of Las Vegas, and 2 miles east of Primm. The same ROI applies to the Silver State Solar South Project analyzed in this Supplemental EIS; however, there are no data regarding existing ambient noise levels for the ROI.

The only residences within the ROI are in Primm at the Desert Oasis apartment complex, approximately 1 mile west of the ROW application area. There are no hospitals, libraries, schools, places of worship, or other sensitive noise receptors in the ROI.

3.3 GEOLOGY, TOPOGRAPHY AND GEOLOGIC HAZARDS

Geology, topography, and geologic hazards in the regional area and the Silver State Solar Project ROW application area are described in *Section 3.3* in the 2010 Final EIS. The ROI generally described in the 2010 Final EIS encompassed the alluvial fan area of the Lucy Gray Mountains (geology and topography), and faults and seismic areas within 100 miles of Primm, Nevada. The same ROI applies to the Silver State Solar South Project analyzed in this Supplemental EIS. A summary of the Affected Environment description from the 2010 Final EIS is presented below, with updates as relevant for the expanded ROW application area.

3.3.1 Geology

The majority of the 12,958-acre ROW application area is composed of Quaternary alluvium deposits (Figure 3.3-1). The ROW application area extends to the south over metamorphic rocks at the base of the Lucy Gray Mountains. Unlike the unconsolidated materials that comprise the bulk of the site, these are hard rocks altered through changes in pressure and temperature. These rocks date to the Proterozoic period (approximately 2,500 to 542 million years ago). A small portion of the supplemental ROW application area on the margins of Roach Lake is composed of locally eroded alluvial flat deposits.

3.3.2 Topography

The ROW application area is on gentle slopes at the base of the Lucy Gray Mountains, intersected by numerous dry washes. The southern portion of the ROW application area overlays a prominent alluvial fan. Surface water within this area drains to Ivanpah Dry Lake to the south and Roach Dry Lake to the north.

3.3.3 Geologic Hazards

Geologic hazards associated with the previously analyzed and new ROW application areas are consistent with those described in Section 3.3.3 of the 2010 Final EIS. Geologic hazards as described in the 2010 Final EIS are incorporated by reference in this Supplemental EIS and summarized below.

Nevada is considered to be highly active in terms of fault motion. As the Basin and Range province is being pulled apart in an east-west orientation, faults shift to accommodate the tectonic activity (NBMG 2008 – Map 167). There are no mapped faults or fault zones within the ROW application area, but there are nearly 150 mapped faults or fault zones within 100 miles of Primm, Nevada (United States Geological Service [USGS] 2009). The Stateline Fault is less than 1 mile west of the ROW application area, near Primm, and was previously thought to be inactive with only minor historic movement. Recent studies found that this fault was responsible for substantial movement (30 ± 4 kilometers) over the past 13 million years. These new data indicate that the fault is either in an inactive period or that this movement has transitioned to other faults within the Eastern California Shear Zone to the west (Geological Society of America [GSA] 2007).

Since 1990, 22 earthquakes with a magnitude of 5.0 or higher on the Richter scale have occurred within 100 miles of Primm, Nevada (USGS 2005). The area is categorized as having peak ground acceleration (PGA) for a 10 percent probability of exceedance in 50 years in percentage of 9%g (i.e., the acceleration of gravity). This PGA is associated with “moderate” shaking resulting in “very light damage” to structures (USGS 2008).

The area surrounding Primm, Nevada is categorized as having low susceptibility to and incidence of landslide (Godt 2001).

3.4 SOIL RESOURCES

The ROI for soil resources includes the full 12,958-acre ROW application area. Soil types in the previously analyzed ROW application area, 7,387 acres of which overlap with the current ROW application area, are described in *Section 3.4* in the 2010 Final EIS. Based on review of soils maps, most of the soil types in the supplemental ROW application area are consistent with those as described in the 2010 Final EIS.

3.4.1 Soils

The following soil types are found within the 7,387 acres of the ROW application area that was analyzed in the 2010 Final EIS: Tonopah-Arizo soil association (97.5 percent), composed primarily of sandy loam and coarse sand; Haleburu association (2.5 percent), composed of sandy loam and rock outcrop; and Nippeno-Nipton association (0.01 percent), composed primarily of gravelly and sandy loam.

The supplemental ROW application area would include three soil associations not previously described in the 2010 Final EIS (Table 3.4-1), Playas, Tipnat-Bluepoint-Hypoint association, and Prisonsar Fine Sand, on 2-8 percent slopes.

Table 3.4-1. Soil Types in the Previously Analyzed and Current ROW Application Areas

Soil Type	Previously Analyzed ROW Application Area (acres/% of total)	Supplemental ROW Application Area (acres/% of total)	Total ROW Application Area (acres/% of total)
Tonopah-Arizo	7,201 acres/97.5%	3,940 acres/ 70.7%	11,141 acres/ 86.0%
Haleburu	185 acres/2.5%	8 acres/ 0.01%	193 acres/ 1.5%
Nippeno-Nipton	1.0 acres/0.01%	23 acres/ 0.04%	24 acres/ 0.2%
Prisonsar Fine Sand, 2-8% slopes	N/A	852 acres/ 15.3%	852 acres/ 6.6%
Playas	N/A	269 acres/ 4.8%	269 acres/2.1%
Tipnat-Bluepoint-Hypoint Association	N/A	479 acres/ 8.6%	479 acres/ 3.7%
<i>Total</i>	<i>7,387 acres</i>	<i>5,571 acres</i>	<i>12,958 acres</i>

Source: NRCS 2012.

Playas consist of Playas silty clay loam (90 percent), Tipnat loamy sand (5 percent), and Hypoint gravelly loamy sand (5 percent). Playas are typically formed by large rain events that cause intermittent standing water that does not last longer than a week or two before the surface dries.

The Tipnat-Bluepoint-Hypoint association consists of the following components: Tipnat loamy sand (55 percent); Hypoint gravelly loamy sand (20 percent); Bluepoint gravelly loamy fine sand (15 percent); Typic Torriorthents loamy fine sand (6 percent); and Playas silty clay loam (4 percent). The Tipnat-Bluepoint-Hypoint association is found in closed basin systems between 2,590 to 2,720 feet in elevation (U.S. Department of Agriculture [USDA] & Natural Resources Conservation Service [NRCS] 2006).

Tipnat soils consist of very deep, well drained soils that formed in mixed alluvium found on alluvial fans on slopes between 0 and 4 percent. Bluepoint soils consist of very deep, somewhat excessively drained soils that formed in eolian materials from mixed rock sources found on dunes and sand sheets on slopes between 0 and 30 percent. Hypoint soils consist of very deep, somewhat excessively drained soils that formed in mixed alluvium found on fan aprons, fan skirts and alluvial fans on slopes between 0 and 4 percent (USDA & NRCS 2006). The Prisnear Fine Sand soils cover most of Roach Lake and are moderately deep to a petrocalcic horizon. They are somewhat excessively drained soils and formed in eolian sands over alluvium from limestone. They are typically located on sand sheets over fan remnants (USDA and NRCS 2006).

3.4.2 Cryptobiotic Soils

Cryptobiotic soils (also referred to as biological soil crusts or cryptogamic soils) are formed by living organisms (algae, bacteria, mosses, and lichens) and their byproducts over geologic time. These soils are valuable to desert ecosystems because they stabilize loose desert soil types and minimize erosion and dust generation. Due to their low rate of formation, these biotic soil crusts are extremely vulnerable to environmental disturbances, such as fire, and anthropogenic impacts, such as grazing, hiking, biking, off-highway vehicle (OHV) use, renewable energy development, and military activities. Biological soil crusts are found throughout the desert southwest and are present within the ROW application area. This soil type and associated vegetation was not identified within previous ROW application area during field surveys conducted for the 2010 Final EIS (CH2M Hill 2009; Sycamore Environmental Consultants, Inc. 2009). However, cryptobiotic soils were observed by an AMEC biologist during a site walk in 2011 (AMEC 2011), and for the purposes of analysis are assumed to be present throughout the ROI.

3.4.3 Erosion

Wind erodibility of the soil in the area is classified on a scale between 1 and 10, 1 being highly erodible and 10 being minimally erodible. The Haleburu, Nippeno-Nipton, and Tonopah-Arizo associations are all classified as Wind Erodibility 8, the description of which is, “erosion not a problem.” The Tipnat-Bluepoint-Hypoint association has a classification of 2, indicating substantial wind erodibility. Playas have a classification of 4L, indicating a moderate potential for wind erosion. Prisnear Fine Sand has a classification of 1, and is highly wind erodible.

The soils in the area are also classified by NRCS for hazard of soil loss after disturbance activities that expose the soil surface, with classifications of slight or moderate. These

classifications account for risk of water erosion. A rating of "slight" indicates that erosion is unlikely under ordinary climatic conditions; "moderate" indicates that some erosion is likely and that erosion-control measures may be needed (NRCS 2012). The hazard of soil loss for disturbed areas of the Haleburu Association is moderate; Nippeno-Nipton is moderate; Tonopah-Arizo is slight; Playas is slight; Tipnat-Bluepoint-Hypoint is slight; and Prisonear Fine Sand is slight (NRCS 2011).

3.5 WATER RESOURCES/HYDROLOGY

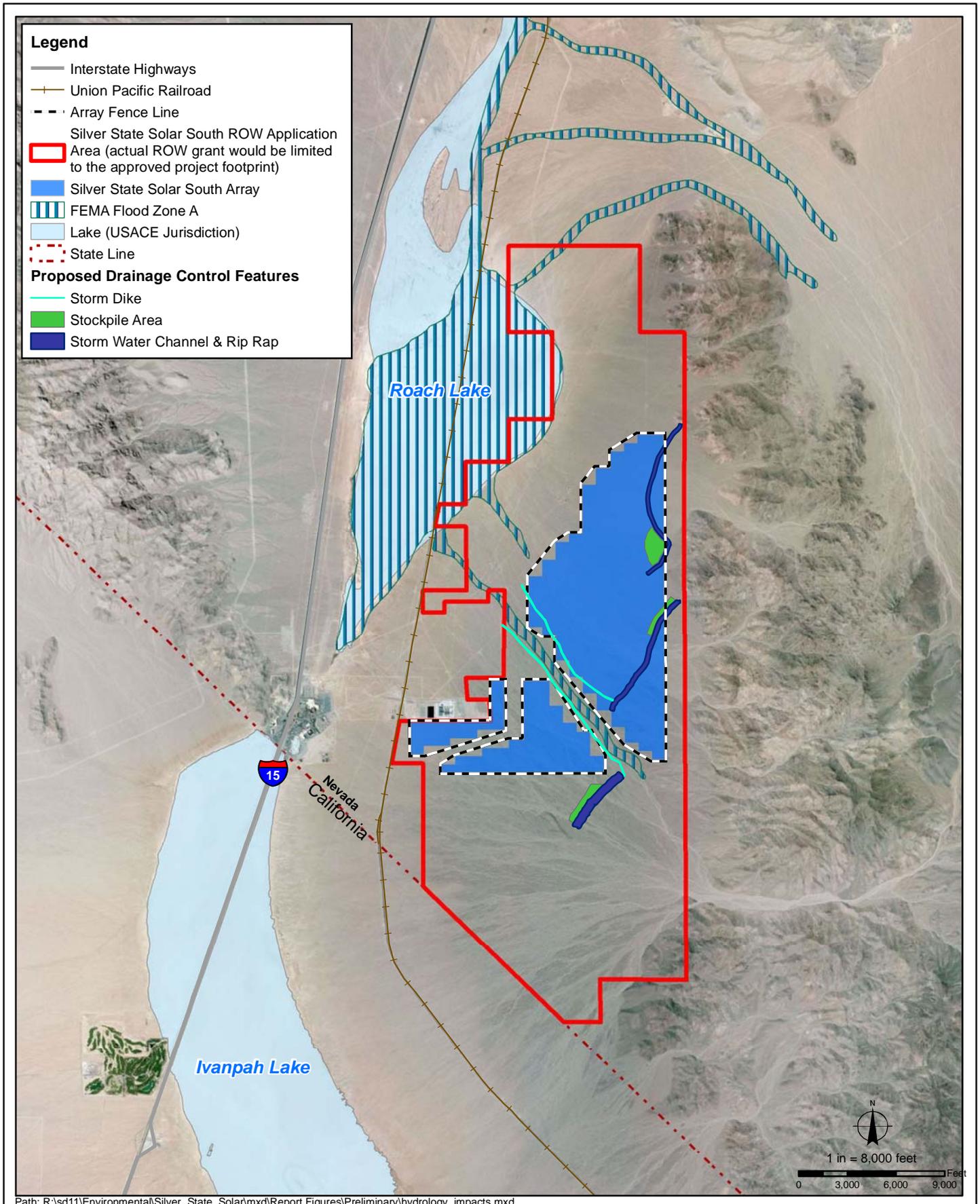
Water resources in the regional area are described in *Section 3.5* in the 2010 Final EIS (BLM 2010). The surface water ROI described in the 2010 Final EIS encompassed the Ivanpah Valley in Nevada and California. The groundwater ROI described in the 2010 Final EIS included the Ivanpah-Pahrump Valley groundwater sub-basin. The same surface water and groundwater ROI applies to the Silver State Solar South Project analyzed in this Supplemental EIS. A summary of the Affected Environment description from the 2010 Final EIS is presented below, with updates as relevant for the 5,571 acres of supplemental ROW application area not analyzed in the 2010 Final EIS.

3.5.1 Surface Water Resources

The 12,958-acre ROW application area is situated on a broad alluvial fan that extends westward from the base of the Lucy Gray Mountains toward Ivanpah Dry Lake and Roach Dry Lake. Ivanpah Dry Lake and Roach Dry Lake are less than 2 miles southwest and adjacent to the northwest, respectively, of the combined ROW application area. Ivanpah Dry Lake is in California in the valley bottom south of the previously analyzed ROW application area. Roach Dry Lake is in Nevada, northwest and adjacent to the new ROW application area. Numerous ephemeral washes dissect the alluvial fan. Streams, washes, and playas are dry most of the year, with surface water only present following storm events (CH2M Hill 2009). There are no known springs mapped on the USGS Desert or Roach Lake quadrangle in the entire ROW application area, including in the immediate surrounding mountain ranges (USGS 2009). Additionally, the ROW application area does not contain mapped hydric soils (NRCS 2009), nor does it contain or drain to a wild and scenic river (Wild & Scenic River Council 2009). Figure 3.5-1 presents all hydrologic features within the ROI.

An August 2009 field survey of the 2,900-acre footprint of the previously proposed Silver State Solar Project identified numerous interconnected ephemeral washes ranging in size from small (3 to 10 feet wide) wash features to medium, broad (10 to 20 feet wide) drainages. The active flow channels of the smaller washes are generally devoid of vegetation and typically have a sandy-gravel substrate, although some washes also contain cobble and scattered larger rocks. Most of the larger channels typically contain scattered vegetation (CH2M Hill 2009). Based on field inspection, review of aerial imagery, and maps of hydrologic features (Figure 3.5-1), similar hydrologic conditions are present within the 12,958-acre ROW application area.

As there are no perennial waterbodies in the ROW application area, there is no surface water quality data available. The ROW application area does not contain, nor is it tributary to, any



**Hydrologic Features
Silver State Solar South Project**

**FIGURE
3.5-1**

waterbodies on Nevada’s 303d list for exceeding state water quality standards (Nevada Department of Environmental Protection [NDEP] 2009).

3.5.2 Flooding

The relative flood hazard risk classes for the ROW application area range from “Very High” in the northern portions to “Low” to “None” in the southern portions based on local topography (House 2006). Flood hazard zones are delineated by the Federal Emergency Management Act (FEMA) for the purpose of predicting the extent of the 100-year and 500-year flood hazards for insurance and floodplain management. Two FEMA Special Flood Hazard Areas (100-year flood zone) are present in the combined ROW application area, one of which is limited to the new ROW application area and one that crosses both the new ROW application area and that previously analyzed in the 2010 Final EIS (Figure 3.5-1) (FEMA 2011). However, it is also likely that many washes in the ROW application area not yet delineated by FEMA may be subject to flooding based on the frequency of flooding events in the region and the characteristics of flooding on alluvial fans.

The hydrologic processes that occur on alluvial fans can be unpredictable due to sporadic but sometimes intense rainfall events. Sediments, which can range from clay to large boulders, are transported across alluvial fans by water in desert washes, debris flows, and sheet floods. Flood events on alluvial fans in arid climates are triggered by significant storms. Specific to the Mojave Desert region, these would include the summer cloud bursts that occur infrequently but can supply a large amount of water to a localized area, or a larger storm such as a tropical storm that occurs on a 100-year time scale. Any of these storms could result in flooding hazards that would cause major damage across the ROW application area.

3.5.3 Groundwater

The proposed Silver State Solar South Project is located in the Central Region of Nevada’s Hydrographic Regions. The Central Region is the largest hydrographic region in Nevada, covering 46,783 square miles, and includes 78 hydrographic areas (Nevada Division of Water Resources [NDWR] 2009c). The project area is within the Ivanpah Valley Northern Part (164A) and Southern Part (164B) hydrographic basins (NDWR 2009a). Refer to Table 3.5-1 for details about these groundwater basins.

Table 3.5-1. Groundwater Basin Characteristics

Groundwater Basin	Area (square miles)	Perennial Yield (acre-feet/year)	Committed Resources	
			Acre-Feet/Year	Designated?
Ivanpah Valley Northern Part (164A)	253	700	2,108	Yes
Ivanpah Valley Southern Part (164B)	73	250	708.75	Yes
Source: NDWR 1992; BLM 2010.				

The basins consist of alluvial-basin fill groundwater aquifers contained in unconsolidated deposits of suspected Pliocene through Holocene age sand and gravel (BLM 2009b, USGS 2003). The maximum thickness of the alluvium in the basin is at least 825 feet (California Department of Water Resources [CDWR] 2004). These aquifers receive groundwater recharge through infiltration of runoff from the mountain and alluvial fan slopes, and from direct rainfall. The aquifer system includes coarser grained aquifer units containing the water and finer-grained confining units, retarding vertical and lateral groundwater flow (BLM 2009b).

No specific groundwater data was found for the area within the ROW application boundary; however, the static water level in four water wells drilled within 0.5 mile of the ROW application area range in depth from 105 to 312 feet below the surface, with one well yielding 132 gallons per minute (NDWR 2009d). The ROW application area does not lie within a wellhead protection area, source water protection area, or designated sole source aquifer (NDEP 2008, Nevada Rural Water Association 2009, USEPA 2009). The nearest completed source water assessment is for Whiskey Pete's Hotel and Casino, over two miles from the ROW application area along I-15 (Source Water Assessment #NV0001073; NDEP 2009c).

Groundwater quality in the hydrologic basins in the Mojave Desert in California and Nevada is generally acceptable for most uses of groundwater; however, since many of the basin-fill aquifers have closed surface drainage and limited inter-basin flow, aquifers may contain poor quality saline waters, elements from natural geothermal activity, and contaminants from mining or energy operations (BLM 2009b). Groundwater in Ivanpah Valley is generally considered marginal to inferior and is high in calcium, sodium, and fluoride (CDWR 2004). Groundwater in the area of the Primm Wastewater Treatment Plant, approximately 2 miles west of the ROW application area, is reported to be poor quality with high levels of total dissolved solids (NDEP 2009b, NDWR 2009d).

One well is within the previously analyzed 7,387-acre portion of the ROW application area. Water from the well was used for dust control associated with the 50-MW Silver State Solar North. Four sites with permitted water rights are within 0.5 mile to the west of the ROW application area (NDWR 2009a). One site is sourced by effluent from the Primm Wastewater Treatment Plant and permitted for power and water storage at the adjacent NV Energy Walter M. Higgins Generating Station. The re-use of the treated effluent is also authorized for construction purposes and dust suppression (NDWR 2009b, NDEP 2009b). The remaining sites are sourced by wells for quasi-municipal use (NDWR 2009a).

The Applicant obtained access in 2010 to water from LVVWD for use in construction of the Silver State Solar North Project and the potential construction and operation of Silver State Solar South Project (LVVWD 2010). A modified water agreement was obtained in June 2011 (LVVWD 2011). To obtain the water, LVVWD required the Applicant to fund the treatment and recharge of 270 acre-feet per year (afy) of wastewater into the groundwater basin. The current modified agreement between the Applicant and LVVWD allows:

- Water for construction of Silver State Solar North - 300 afy in 2011 and 200 afy in 2012
- Water for potential construction of Silver State Solar South – minimum of 200 afy available after completion of required wastewater treatment and recharge project, available between 2013 and 2017

- Water for operation and maintenance after completion of Silver State Solar North and potential completion of Silver State Solar South – maximum of 21 afy after the project is complete and power is delivered to a customer; contingent on completion of required wastewater treatment and recharge project.

3.5.4 Jurisdictional Waters, Drainages, and Riparian Areas

The previously proposed project analyzed in the 2010 Final EIS was determined by the US Army Corps of Engineers to potentially affect jurisdictional waters of the US. However, the 50MW portion of that project that was approved in the ROD (Silver State Solar North) was determined by USACE to not require a Section 404 permit as the drainage would not cross state lines.

The proposed Project analyzed in this Supplemental EIS was designed to avoid impacts to waters of the US by avoiding those ephemeral drainages that drain across the Nevada/California border to Ivanpah Lake. First Solar received a letter from USACE stating that the project configuration proposed as Alternative B would not result in drainage to jurisdictional waters, and would not require a Section 404 permit (Regulatory Division SPK-2010-00222-SG). Construction of any of the project alternatives would require a "Temporary Permit For Working in Waterways" from NDEP for drainage that is tributary to Roach Lake.

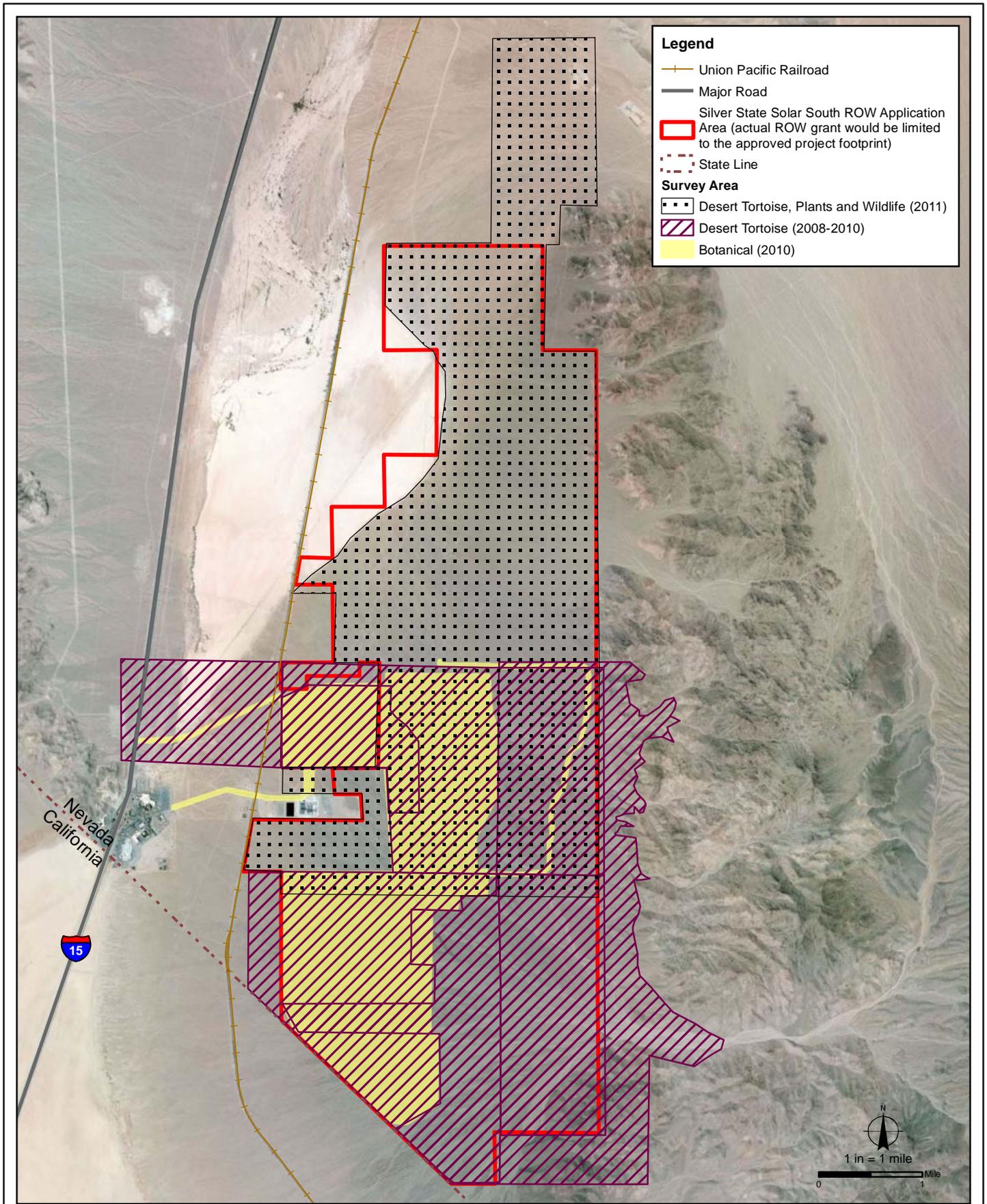
3.6 BIOLOGICAL RESOURCES

Biological resources in the current ROW application area and the surrounding desert and mountains are described in *Section 3.6* in the 2010 Final EIS (BLM 2010). A summary of the Affected Environment description from the 2010 Final EIS is presented below, with updates as relevant for the expanded ROW application area. The ROI for botanical species is limited to the ROW application area while the ROI for wildlife species is dependent upon the species. The ROI is limited to the ROW application area for small, less mobile species and is up to 10 miles for highly mobile species such as eagles.

Biological surveys were conducted throughout the ROW application area (Figure 3.6-1). Wildlife surveys were conducted in April and May of 2008, 2009, 2010, and 2011. Botanical surveys were conducted in April 2010 and April-May 2011. All survey methodologies were developed in consultation with the BLM Southern Nevada District Office (Sundance Biology 2009; Sycamore Environmental 2010; CH2M Hill 2010; Ironwood Consulting 2012). Results from all surveys were compiled in a single Biological Resources Technical Report (Ironwood Consulting 2012) which is referenced extensively in the following sections.

For the purposes of this analysis, special status species are defined as plant or wildlife species that meet the following criteria:

- designated as threatened or endangered under the Endangered Species Act (ESA),
- candidate species considered for listing under the ESA,
- designated as sensitive by the BLM, and/or
- protected under NRS and NAC Sections 501, 503, and 527.



**Biological Resource Surveys Conducted in the
ROW Application Area, 2008-2011
Silver State Solar South Project**

**FIGURE
3.6-1**

3.6.1 Vegetation and Special Status Plant Species

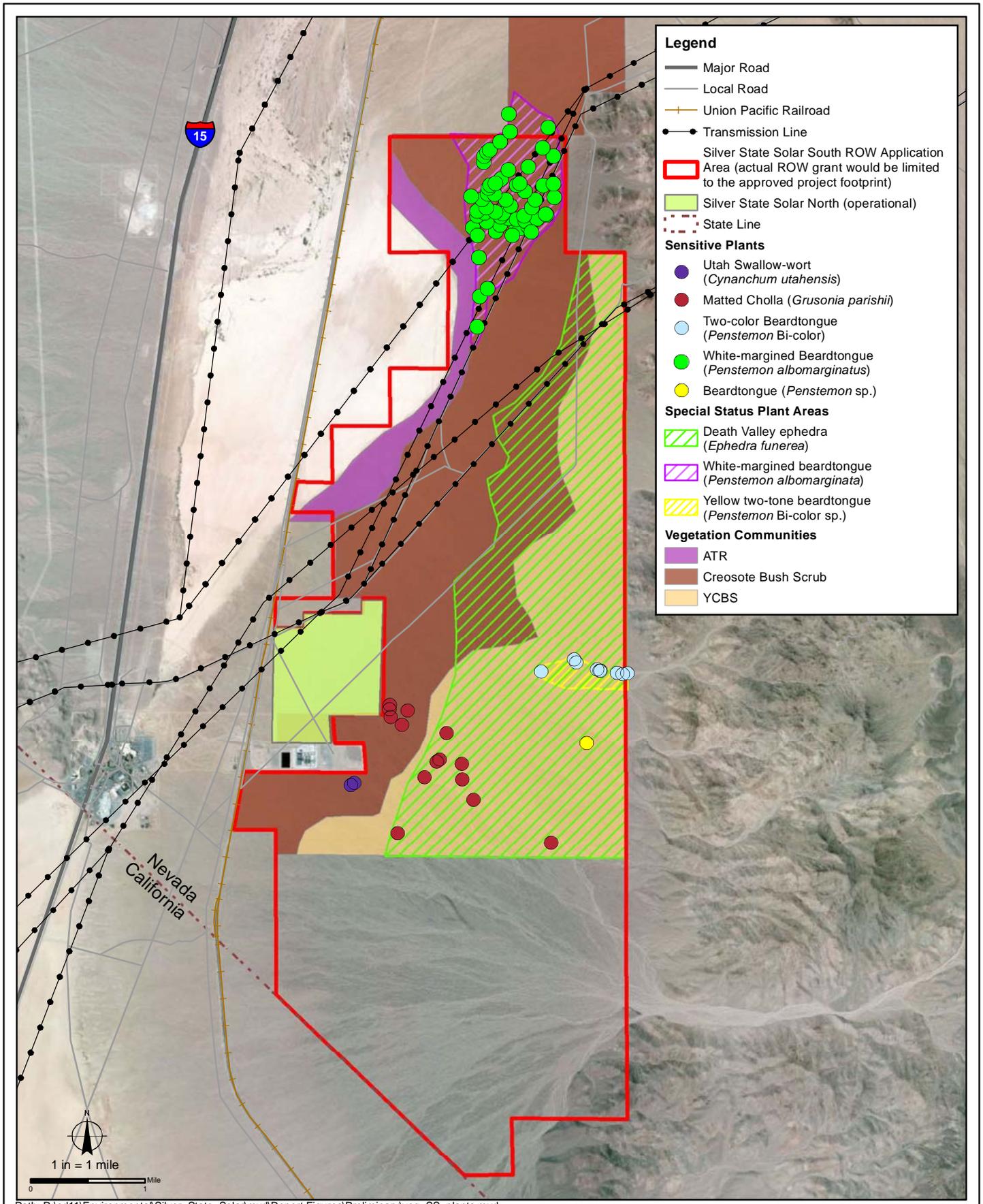
3.6.1.1 Vegetation

The ROW application area contains three vegetation alliances that are based on the Nevada Natural Heritage Program classification (Peterson 2008): Creosotebush-White Burrobush Shrubland, Mojave Yucca-Creosotebush-White Burrobush Shrubland, and Allscale Shrubland, and Playa in order of prevalence (Ironwood Consulting 2012) (Figure 3.6-2). The two most prevalent vegetation alliances are dominated by creosotebush (*Larrea tridentata*) and white burrobush (*Ambrosia dumosa*) with the obvious difference of Mojave yucca (*Yucca schidigera*) being present in the Mojave Yucca-Creosotebush-White Burrobush Shrubland. Mojave yucca and cacti are almost absent from the Creosotebush-White Burrobush Shrubland (Sycamore Environmental 2010). Allscale Shrubland is dominated by allscale (*Atriplex polycarpa*) with creosotebush as a codominate (Peterson 2008). Within the ROW application area the Creosotebush-White Burrobush Shrubland is most prevalent in the mid-elevation range while the Mojave Yucca-Creosotebush-White Burrobush Shrubland higher in the alluvial fan within soils that contain higher proportions of gravel and rock. The Allscale Shrubland occurs in the lower elevations of the valley between the Creosotebush-White Burrobush Shrubland and the playa bottoms where the soil is sandier. Plant species characteristic of these alliances include Death Valley ephedra (*Ephedra funerea*), littleleaf ratany (*Krameria erecta*), California buckwheat (*Eriogonum fasciculatum*), beavertail cactus (*Cylindropuntia basilaris*), and golden cholla (*Cylindropuntia echinocarpa*). Common herbaceous species include desert chicory (*Rafinesquia neomexicana*), peppergrass (*Lepidium densiflorum*), combseed (*Pectocarya platycarpa*), rigid spineflower (*Chorizanthe rigida*), cryptantha (*Cryptantha* spp.), sun cup (*Camissonia* spp.), and desert pincushion (*Chaenactis fremontii*) (Sycamore Environmental 2010; Ironwood Consulting 2012).

Invasive Species

Under Executive Order 13112, an invasive species is defined as “alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health”. Much of the management of invasive plants and the listing of noxious weeds are regulated by the USDA under the Federal Noxious Weed Act (7 USC 2801 et seq. 1974). In addition, the Nevada Department of Agriculture (NDA) maintains a list of noxious weeds, manages weed prevention, control, and management in Nevada.

One invasive plant species listed on the NDA’s noxious weed list was found within the ROW application area: Sahara mustard (*Brassica tournefortii*). Sahara mustard is listed as a Category B species by the NDA. Category B species are actively excluded where possible and are controlled by the state in areas where populations are not well established or previously known to occur. Tamarisk, or salt cedar (*Tamarisk* sp.) is listed as a Category C species by the NDA. Four other species were found within the ROW application area that are generally considered invasive but are not included on state or federal lists. These species are Mediterranean grass (*Schismus barbatus*), cheat grass (*Bromus tectorum*), red brome (*Bromus madritensis* ssp. *rubens*), and Russian thistle (*Salsola tragus*) (Ironwood Consulting 2012).



**Vegetation and Special Status Plants in the Study Area
Silver State Solar South Project**

**FIGURE
3.6-2**

3.6.1.2 Special Status Plant Species

No federally threatened, endangered, proposed, or candidate plant species were located during surveys of the ROW application area. Surveys for special status plant species were conducted in April 2010 and April and May 2011 during the blooming season for the targeted species. Seven special status species were considered to have potential to occur within the ROW application area. All seven species are listed by the Nevada BLM as sensitive species. The Las Vegas bearpoppy (*Arctomecon californica*) is also listed as critically endangered by the State of Nevada. Table 3.6-1 lists those species and habitat.

Of these seven special status plant species, only the white-margined beardtongue and yellow twotone beardtongue were located within the ROW application area. The yellow twotone beardtongue was found in the eastern edge of the ROW application area in a broad wash system. The white-margined beardtongue was found near the northern end of the ROW application area in sandy soils associated with the washes that wrap around the northern tip of the Lucy Gray Mountains (Ironwood Consulting 2012).

Table 3.6-1. Special Status Plant Species with Potential to Occur within the ROW Application Area

Common Name	Status	Habitat
White bearpoppy (<i>Arctomecon merriami</i>)	ESA: none BLM: sensitive State: none	Desert saltbush scrub and Mojave desert scrub. Limestone and dolomite soils; on ridges, rocky slopes, gravelly canyon washes. 2,000 to 6,200 feet.
Las Vegas bearpoppy (<i>Arctomecon californica</i>)	ESA: none BLM: sensitive State: CE*	Mojave desert scrub and desert saltbush scrub on gypsum soils. 1,300 to 2,700 feet.
Spring Mountains milkvetch (<i>Astragalus remotus</i>)	ESA: none BLM: sensitive State: none	Mojave desert scrub with rocky, gravelly, or sandy calcareous soils. 3,400 to 7,050 feet.
Clokey buckwheat (<i>Eriogonum heermannii</i> var. <i>clokeyi</i>)	ESA: none BLM: sensitive State: none	Mojave desert scrub, shadscale, and blackbrush with carbonate outcrops, talus, scree slopes, and gravelly washes. 4,000 to 6,000 feet.
White-margined beardtongue (<i>Penstemon albomarginatus</i>)	ESA: none BLM: sensitive State: none	Mojave desert scrub, blackbrush, and stabilized dunes with sandy soils. 2,100 to 5,890 feet.
Yellow twotone beardtongue (<i>Penstemon bicolor</i> ssp. <i>bicolor</i>)	ESA: none BLM: sensitive State: none	Creosote-burrobush, blackbrush, and mixed scrub. Calcareous or carbonate soils in washes, roadsides, rock crevices, outcrops. 2,500 to 5,480 feet.
Rosy twotone beardtongue (<i>Penstemon bicolor</i> ssp. <i>roseus</i>)	ESA: none BLM: sensitive State: none	Creosote-burrobush, blackbrush, and mixed scrub communities. Rocky calcareous, granitic, or volcanic soils. 1,800 to 4,839 feet.
*CE – Critically Endangered		

Cactus and Yucca

Cactus and yucca, as well as evergreen trees, are protected and regulated by the BLM and the State of Nevada. Under NRS 527.060-527.120, it is illegal for any individual or company to cut, destroy, mutilate, remove, or possess any cactus, yucca, evergreen tree, or portions of these plants. Eleven species of cactus and one species of yucca were found within sampling plots and transects during surveys in 2010 and 2012. Surveys in 2010 were conducted on 20 sample plots (approximately 1.88 acres each, 37.65 acres total), and surveys in 2012 were conducted on 5 transects of variable length, totaling 282 acres. Table 3.6-2 lists those species found and provides estimates of the number of individuals for each alternative, based on the 2012 surveys which provided greater coverage of the ROW application area. Portions of Alternatives B and C extend beyond the area encompassed by the 2012 transects, and slightly different cactus and yucca densities or species composition may be present in those areas. One additional species, Mojave pricklypear *Opuntia erinacea* var. *erinacea*, was observed infrequently in the ROW application area but not detected on any sample plots or transects.

Table 3.6-2. Cacti and Yucca Estimates within each Project Footprint

Common Name Scientific Name	Estimated Number of Individuals for Alternative B	Estimated Number of Individuals for Alternative C	Estimated Number of Individuals for Alternative D
Buckhorn Cholla <i>Cylindropuntia acanthocarpa</i> var. <i>coloradensis</i>	32,291	21,067	25,967
Silver Cholla <i>Cylindropuntia echinocarpa</i>	30,105	19,640	24,209
Pencil Cactus <i>Cylindropuntia ramosissima</i>	53,063	34,618	42,670
Clustered Barrel Cactus <i>Echinocactus polycephalus</i> var. <i>polycephalus</i>	697	455	560
Hedgehog Cactus <i>Echinocereus engelmannii</i>	5,261	3,432	4,231
California Barrel Cactus <i>Ferocactus cylindraceus</i> var. <i>cylindraceus</i>	4,947	3,227	3,978
Matted Cholla <i>Grusonia parishii</i>	14	9	11
Fish-hook Cactus <i>Mammillaria tetrancistra</i>	287	187	231
Beavertail Cactus <i>Opuntia basilaris</i> var. <i>basilaris</i>	5,043	3,290	4,055
Mojave Pricklypear <i>Opuntia erinacea</i> var. <i>erinacea</i>	Uncommon	Uncommon	Uncommon
Mojave Yucca <i>Yucca schidigera</i>	42,691	27,851	34,330
Total	174,397	113,777 (2012)	140,242

3.6.2 Wildlife and Special Status Wildlife Species

3.6.2.1 Wildlife

Surveys of the ROW application area conducted in spring 2008, 2009, and 2011, found 35 bird species with black-throated sparrow (*Amphispiza bilineata*), horned lark (*Eremophila alpestris*), and ash-throated flycatcher (*Myiarchus cinerascens*) as the most common species detected.

Thirteen species of reptile were observed with western whiptail (*Cnemidophorus tigris*), side-blotched lizard (*Uta stansburiana*), and zebra-tailed lizard (*Callisaurus draconoides*) detected most often. Six mammal species were detected with black-tailed jackrabbit (*Lepus californicus*), white-tailed antelope ground squirrel (*Ammospermophilus leucurus*), and desert woodrat (*Neotoma lepida*) observed most frequently. No fish or amphibian species are likely to inhabit the ROW application area due to an absence of aquatic habitat (Sundance Biology 2009; Ironwood Consulting 2012).

3.6.2.2 Special Status Wildlife Species

Special status wildlife species with the potential to occur within the ROW application area may be regulated under three different categories. Species may be listed as threatened, endangered, candidate, or proposed for listing under the ESA; species may be managed as a sensitive species by the Nevada BLM; and species may be protected by the State of Nevada under NRS 501. Table 3.6-3 lists the 21 special status wildlife species with the potential to occur within the ROW application area, their regulatory status, and likelihood of occurrence in the area. Of these 21 species, nine species were documented during surveys.

Desert Tortoise

The desert tortoise was the only species listed under the ESA found within the ROW application area. Surveys for desert tortoise were conducted in spring 2008, 2009, and 2011.

Surveys conducted in 2008 and 2009 utilized a modified Tortoise Regional Estimates of Density Model (TRED) method of surveying and covered only the 7,925-acre ROW application area analyzed in the 2010 Final EIS while the 2011 surveys were conducted via full coverage transects of the current 12,958-acre ROW application area (Sundance Biology 2009, Ironwood Consulting 2012). Analysis conducted by Ironwood Consulting yielded comparative data for these differing survey methods. Table 3.6-4 shows the comparative calculations of the number of tortoises and the density of tortoises within each proposed alternative.

Table 3.6-3. Special Status Wildlife Species with Potential to Occur within the ROW Application Area

Common Name	Scientific Name	Status	Likelihood of Occurrence
Reptiles			
Desert tortoise	<i>Gopherus agassizii</i>	ESA: Threatened BLM: Sensitive State: Protected	Present
Gila monster	<i>Heloderma suspectum cinctum</i>	BLM: Sensitive State: Protected	Not Detected – Moderate Potential
Chuckwalla	<i>Sauromalus obsesus</i>	BLM: Sensitive	Not Detected – Moderate Potential
Birds			
Golden eagle	<i>Aquila chrysaetos</i>	BLM: Sensitive State: Protected	Present
Burrowing owl	<i>Athene cunicularia</i>	BLM: Sensitive State: Protected	Present
Prairie falcon	<i>Falco mexicanus</i>	State: Protected	Present
Peregrine Falcon	<i>Falco peregrinus</i>	BLM: Sensitive State: Protected	Present
Loggerhead shrike	<i>Lanius ludovicianus</i>	BLM: Sensitive State: Protected	Present
Brewer's sparrow	<i>Spizella breweri</i>	BLM: Sensitive State: Protected	Present
Crissal thrasher	<i>Toxostoma crissale</i>	State: Protected	Present
Le Conte's thrasher	<i>Toxostoma lecontei</i>	BLM: Sensitive State: Protected	Present
Mammals			
Pallid bat	<i>Antrozous pallidus</i>	BLM: Sensitive State: Protected	Not Detected – Moderate Potential
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	BLM: Sensitive State: Protected	Not Detected – Low Potential
California myotis	<i>Myotis californicus</i>	BLM: Sensitive	Not Detected – Moderate Potential
Western small-footed myotis	<i>Myotis ciliolabrum</i>	BLM: Sensitive	Not Detected – Moderate Potential
Yuma myotis	<i>Myotis yumanensis</i>	BLM: Sensitive	Not Detected – Low Potential
Brazilian free-tailed bat	<i>Tadarida brasiliensis</i>	BLM: Sensitive State: Protected	Not Detected – Moderate Potential
Desert kit fox	<i>Vulpes macrotis</i>	State: Protected	Present
Source: Sundance Biology 2010; Ironwood Consulting 2011.			

Table 3.6-4. Comparison of Desert Tortoise Range Estimates per Alternative

Alternative	Size (acres)	Range Estimate¹ (tortoises)	Density Range Estimate¹ (tortoise/mi²)
Alternative B	3,855	19 to 85	3 to 14
Alternative C	2,515	36 to 105	9 to 27
Alternative D	3,102	13 to 64	3 to 13

¹ Adult Tortoise (>160 mm mid-carapace length) – range estimates based on lower and higher 95% confidence intervals.
² Estimates from TRED sampling and scaled down to exclude Silver State North (developed).
³ Estimates scaled up to include linear components and associated project features.
Source: Ironwood Consulting 2012.

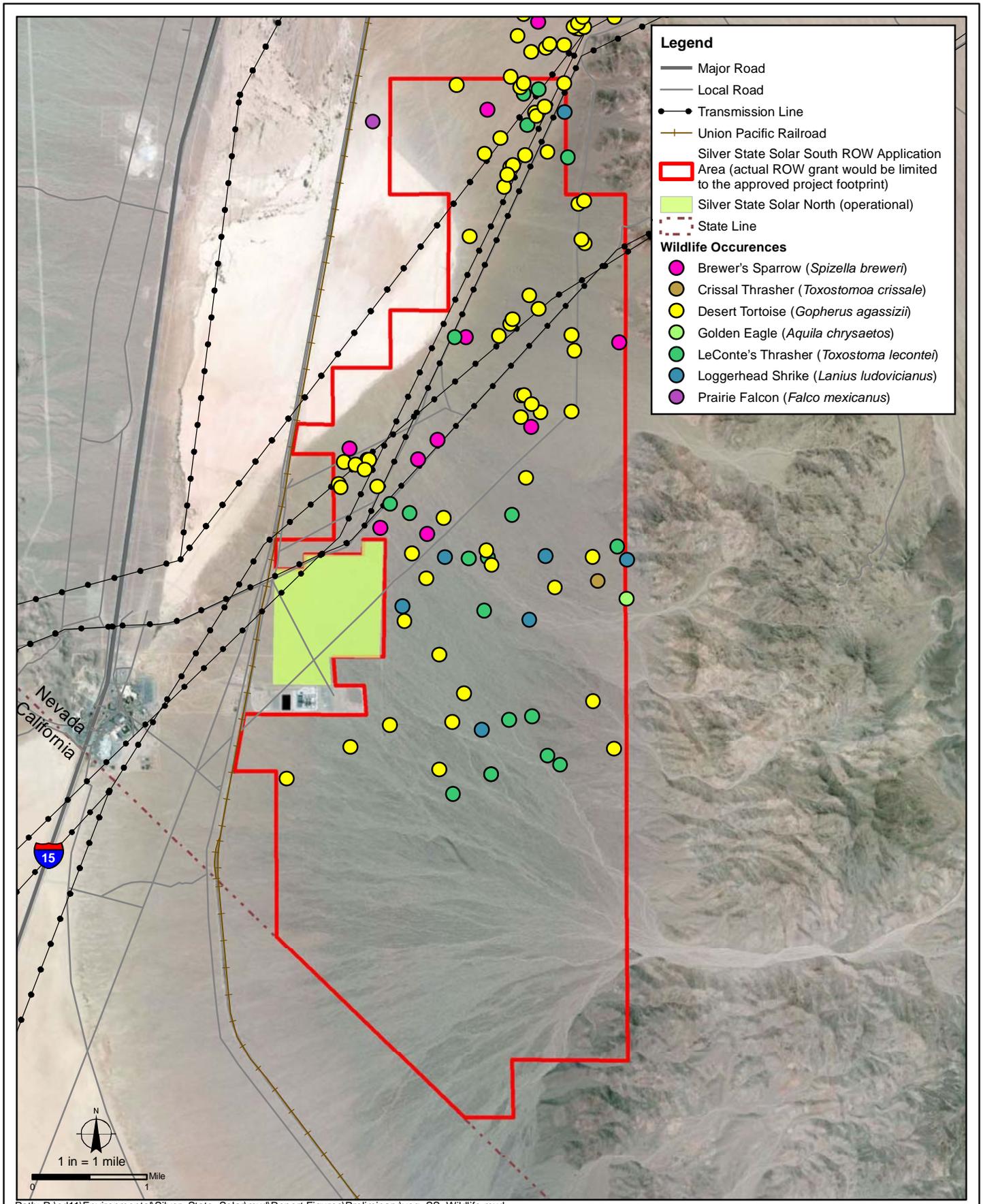
The USFWS has stated that the preservation of habitat connectivity and genetic flow between large geographically distant populations, specifically the connectivity between the Ivanpah and Piute-Eldorado Critical Habitat Units (CHU), is of primary interest by the USFWS (USFWS 2011a and 2011b). Recent studies have indicated connectivity between these CHUs occur north-south through eastern Ivanpah/Roach Valley, which includes the ROW application area, and east-west through the northern McCullough Range south of Hidden Valley (Hagerty et al. 2010; Nussear et al. 2009). The ROW application area is not within a designated CHU.

Golden Eagle

Golden eagles typically build nests on vertical structures such as cliffs and mountains ledges and forage in open areas with sparse vegetation. The entire ROW application area provides suitable foraging habitat for golden eagles; however, no suitable nesting habitat is present. The nearest potentially suitable nesting habitat is located in the McCullough Range over 7 miles to the east of the ROW application area. Aerial surveys conducted in 2010 did not detect any golden eagles within the ROW application area or the Lucy Gray Mountains. Four possible golden eagle territories were detected within the 10-mile ROI. The nearest territory is located within Ivanpah Valley approximately 5 miles west of the ROW application area. Surveys conducted in 2011 observed a pair of golden eagles soaring overhead near the eastern boundary of the ROW application area near the Lucy Gray Mountains (Ironwood Consulting 2012) (Figure 3.6-3). Previous surveys that included the ROW application area, did not detect any golden eagles (Sundance Biology 2009).

Burrowing Owl

Burrowing owls inhabit areas associated with burrowing animals such as open, dry grasslands, agricultural and range lands, and desert habitats. The ROW application area provides suitable habitat for burrowing owls as a result of the presence of desert tortoise and kit fox burrows. Evidence of burrowing owl presence was documented at four burrow locations within the ROW application area during 2011 surveys (Figure 3.6-3; Ironwood Consulting 2012). Previous surveys that included the ROW application area did not detect any burrowing owls (Sundance Biology 2009). No live burrowing owls were observed. Burrowing owls likely inhabit the ROW application area, but at low densities (Ironwood Consulting 2012).



**Special Status Wildlife Species in the Study Area
Silver State Solar South Project**

**FIGURE
3.6-3**

Prairie Falcon

Prairie falcons typically build nests on cliffs and forage in open areas with areas of sparse vegetation providing the best foraging habitat. There is no suitable nesting habitat within the ROW application area. A single prairie falcon was observed in flight approximately 0.25 mile northwest of the ROW application area during 2011 surveys (Figure 3.6-3). Previous surveys of the ROW application area did not detect any prairie falcons (Sundance Biology 2009). There are no records of the species breeding in the McCullough or Lucy Gray Mountains (Floyd et al. 2007; Ironwood Consulting 2012). As a result, prairie falcons are anticipated to utilize the ROW application area infrequently for foraging.

Loggerhead Shrike

Loggerhead shrikes are known to be a resident species throughout Nevada (Floyd et al. 2007). Shrikes primarily feed on large insects, but frequently eat small vertebrates, carrion, and invertebrates (Ehrlich et al. 1988). Although loggerhead shrikes were not detected during previous surveys, seven individual shrikes, including two pairs, were observed within the ROW application area during 2011 surveys (Sundance Biology 2009, Ironwood Consulting 2012) (see Figure 3.6-3). The species is likely a year-round resident of the area (Ironwood Consulting 2012).

Brewer's Sparrow

The Brewer's sparrow is often associated with sagebrush habitats, but may also be common in areas of desert scrub. Typically, the region that comprises the ROW application area is used for migration; however, the species may be found year-round. Brewer's sparrows feed on insects and seeds found on the ground or in low shrubs (Floyd et al. 2007; Udvardy and Farrand 1994). Although previous surveys in the ROW application area did not detect any Brewer's sparrow, more than 30 individuals were detected during the 2011 surveys (Sundance Biology 2009, Ironwood Consulting 2012) (see Figure 3.6-3). The species may be a year-round resident in the ROW application area (Ironwood Consulting 2012).

Crissal Thrasher

Crissal thrashers typically inhabit riparian thickets or mesquite groves in southern Nevada. The species rarely flies in the open, but moves among streamside vegetation gathering ground-dwelling insects (Floyd et al. 2007; Udvardy and Farrand 1994). Although previous surveys in the ROW application area did not detect any crissal thrashers, surveys conducted in 2011 observed a single crissal thrasher along the eastern boundary of the ROW application area (Sundance Biology 2009, Ironwood Consulting 2012) (see Figure 3.6-3). There is little suitable habitat within the ROW application area; however, the species may occupy dense vegetation within the larger wash systems at higher elevations (Ironwood Consulting 2012).

LeConte's Thrasher

LeConte's thrashers inhabit the desert scrub preferring areas with scarce vegetation. This thrasher primarily runs on the ground pursuing prey and avoiding predators. It will fly if necessary, but prefers to remain on the ground. LeConte's thrashers feed on ground-dwelling insects (Floyd et al. 2007; Udvardy and Farrand 1994). Although previous surveys in the ROW application area did not detect any LeConte's thrashers, a total of twenty-eight individual

thrashers, including five pairs, were detected within the ROW application area during 2011 surveys (Sundance Biology 2009, Ironwood Consulting 2012) (Figure 3.6-3). LeConte's thrashers are likely year-round residents of the ROW application area.

Bats

Surveys for bats were not conducted. Six special status bat species (see Table 3.6-3) may occur within the ROW application area. There is no suitable roosting habitat within the ROW application; however, the area may be utilized for foraging. These bat species may roost within the rocky substrates of the mountains in the vicinity of the ROW application area (Ironwood Consulting 2012).

Desert Bighorn Sheep

Desert bighorn sheep are typically found in rugged, mountainous terrain. Steep slopes and cliffs are used to escape from predators. The ROW application area does not contain the preferred habitat of the desert bighorn sheep; however, the area may be used during migration between mountain ranges. The closest ranges that contain known habitat for desert bighorn sheep are the McCullough, Highland, and Spring Mountains in Nevada and the Clark Mountains in California. Use of the ROW application area by desert bighorn sheep is anticipated to be rare. During the May 2010 desert tortoise surveys of the Phase I Relocation Area (eastern portion of the ROW application area), desert bighorn sheep were observed (Sundance Biology 2010).

Kit Fox

Kit foxes are the smallest member of the canid family in North America. They display typical fox features and have relatively large ears placed close together on the head. Kit foxes range in color from yellowish to gray. The species is most commonly found in arid regions such as desert scrub, chaparral, and grasslands. Kit foxes occupy dens which they may construct or take over from other species such as badgers or tortoise. Dens often have multiple openings and are utilized year-round. Kit foxes have an average home range size of 1.24 square miles (Patton and Francl 2008; McGrew 1979). Dozens of canid burrows potentially used by kit fox were observed during all surveys conducted within the ROW application area (Sundance Biology 2009; Ironwood Consulting 2012). One confirmed kit fox burrow complex exhibiting recent activity was located within the ROW application area (Ironwood Consulting 2012) (see Figure 3.6-3).

3.6.3 Wild Horses and Burros

The BLM manages wild horses and burros on sites designated as herd management areas. There are no herd management areas within 10 miles of the ROW application area. No wild horses or burros are expected to occur within the ROW application area.

3.6.4 Rangeland Resources

The Taylor Grazing Act was passed in 1934 and established five of Nevada's six existing grazing districts, including the Las Vegas district. The sixth grazing district, Battle Mountain district, was established in 1951. The 2010 Final EIS identified 53 grazing allotments totaling 2,867,508 acres and 689,852 acres of non-allotted land available for livestock grazing within the

Las Vegas grazing district. Two grazing allotments are located within the ROW application area: the Jean Lake allotment and the Roach Lake allotment. A grazing allotment is a parcel of BLM public land that a permittee leases from BLM.

The season of use on the Jean Lake and the Roach Lake allotments is ‘ephemeral’ and is tied to forage production and the overall ecological health of each allotment. Currently, both allotments are closed to grazing (Johnson 2011). The Jean Lake allotment closed in 2006 and the Roach Lake allotment closed in 2000. The closure of these allotments allows for forage recovery that will benefit livestock, desert tortoises and other wildlife, and will improve overall ecological health.

No additional allotments were established after the ROD was issued on the 2010 Final EIS and both existing allotments remain closed to grazing (Johnson 2011).

3.7 CULTURAL RESOURCES

This section identifies the cultural resources that are common within the Area of Potential Effect (APE) analyzed in the 2010 Final EIS and the expanded ROW application area in this Supplemental EIS. The APE for the 2010 Final EIS consisted of the ROW application area and totaled 7,967 acres, including 7,925 acres associated with the Project area and 42 acres associated with existing access roads. The APE for the Supplemental EIS consists of 5,790 acres, including some overlapping areas evaluated in the Final 2010 EIS. Detailed background information, including historic background and known archaeological resources can be found in *Section 3.7* of the 2010 Final EIS (BLM 2010). A summary of the Affected Environment description from the 2010 Final EIS is presented below, with updates as relevant for the expanded ROW application area. Tribal consultation efforts for both the 2010 Final EIS and Supplemental EIS are discussed in *Section 3.7.3*.

3.7.1 Overview

Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to take into account the effects of their undertakings on historic properties. For the purposes of Section 106, historic properties are defined as including prehistoric and historic sites, buildings, structures, districts, landscapes, and objects included in or eligible for inclusion in the National Register of Historic Places (NRHP), as well as artifacts, records, and remains related to such properties (National Register Bulletin 36). Historic properties can also include those cultural resources that are associated with the cultural practices or beliefs of a living community (National Register Bulletin 38).

According to National Register Bulletin 15 (National Park Service [NPS] 1991), to be eligible for listing on the NRHP, identified cultural resources must have integrity and meet at least one of the four evaluation criteria defined by 36 CFR 60 which reads:

“The quality of significance in American history, architecture, archaeology, engineering, and cultural is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association; and

- a) *that are associated with events that have made a significant contribution to the broad patterns of our history; or*
- b) *that are associated with the lives of persons significant in our past; or*
- c) *that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represents a significant and distinguishable entity whose components may lack individual distinction; or*
- d) *that have yielded, or may be likely to yield, information important in prehistory or history.”*

3.7.2 Known Archaeological Resources

Following is a description of the survey results from the 2010 Final EIS and from efforts in support of the Supplemental EIS.

3.7.2.1 Surveys in Support of 2010 Final EIS

A cultural resource study consisting of a detailed records review and intensive pedestrian survey was conducted in 2009 by Statistical Research, Inc. (SRI) in support of the project evaluated in the Silver State Solar Energy Project Final EIS (White and Lerch 2010). The study was conducted to identify those cultural resources located within the APE which encompassed approximately 7,967 acres of disturbed and undisturbed lands. A total of twenty-three new and five previously recorded sites and sixty-five isolated finds were identified within the APE during an intensive pedestrian survey. The previously recorded sites consisted of two prehistoric and three historic sites; the newly recorded sites included fifteen prehistoric sites, seven historic sites, and one multi-component site. The isolated finds consisted of twelve prehistoric, fifty-two historic, and one of undetermined age. Per the October 2009 State Protocol Agreement between BLM and SHPO, isolated finds are considered categorically not eligible for listing on the NRHP. Of the twenty-seven sites, three were considered eligible for the NRHP and included two prehistoric and one historic site. The prehistoric sites, 26CK1620/8282 and 26CK2632/8280, are located along the previously proposed access route to the project area and mitigation measures to monitor these sensitive areas was proposed, however, this route was not utilized. This route is not included within the Supplemental EIS Project APE. The NRHP-eligible historic property (26CK5180a) that consists of the Southern California Edison (SCE) Eldorado to Ivanpah Transmission Line was not affected by the solar Project in the 2010 Final EIS. Based on the original inventory report for the 2010 Final EIS (White and Lerch 2010), BLM, with SHPO concurrence, determined that no historic properties would be affected. To support the no adverse effects to cultural resources finding, the 2010 Final EIS also included provisions for unanticipated discoveries during construction.

3.7.2.2 Surveys in Support of Supplemental EIS (2012)

In support of the Supplemental EIS, additional cultural resources surveys were conducted within the expanded ROW application area. The APE for the Supplemental EIS was determined to be 5,863 acres.

The cultural resource inventory for the expanded ROW application area resulted in the recordation of seven new and sixteen previously recorded prehistoric and historic sites and seventeen isolated finds (White and Lerch 2012). Of the twenty-three sites, seven are prehistoric, fifteen are historic, and one is less than 50 years in age. The isolated finds consist of fourteen prehistoric and three historic artifacts. Of the twenty-three sites, seven are recommended eligible for listing on the National Register of Historic Places. Three sites (26CK8294, 26CK8300, and 26CK9450) are prehistoric and were recommended eligible under criterion d for their research potential. Four historic electrical-transmission lines, 26CK5180a, 26CK6237, 26CK6238, and 26CK6242, have been previously determined eligible under criteria a and c for their association with the construction of the Hoover Dam and supplying the Los Angeles basin with electrical power as well as their engineering design. The SCE transmission line (26CK5180a) that the new solar alternative would have a new substation and interconnection to would not be adversely affected by the current Supplemental EIS Project as it has been mitigated by documentation in a Historic American Engineering Record (HAER) pursuant to a Programmatic Agreement for this transmission line upgrade EIS Record of Decision signed in November of 2010. This upgrade is currently underway. The remaining three transmission lines would not be directly affected or indirectly (visually) affected by the proposed Project as setting is not a quality of their integrity for NRHP-eligibility. The San Pedro, Los Angeles and Salt Lake/Union Pacific Railroad (26CK5685) is eligible under criteria a and d, however, the track is totally rebuilt within the APE and only a 1925 concrete culvert is a contributing feature under Criterion d. The remaining site, 26CK7862, is a former Northrop Aircraft test-flight facility and has previously been determined not eligible to the NRHP.

According to 36 CFR Part 800.5: *“An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a history property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property... Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance, or be cumulative”*

As stated above, the five linear NRHP-eligible resources will not be adversely affected by this Project. The remaining three NRHP-eligible prehistoric sites that are within the APE are located outside the area shown in the proposed Site Development Plan (as of March 21, 2012) and as such would be avoided by all Project alternatives. Therefore, the alternatives being considered for the Supplemental EIS do not result in adverse effects to cultural resources.

3.7.3 Tribal Consultation

Following is a discussion of Tribal consultation efforts in support of the 2010 Final EIS and the Supplemental EIS.

3.7.3.1 Tribal Consultation in Support of the 2010 Final EIS

Tribal consultation was conducted in 2009 in support of the 2010 Final EIS (see *Section 3.7.3* of the 2010 Final EIS). Consultation letters were sent to six tribes and a field visit with two, the Chemehuevi Indian Tribe and Moapa Band of Paiutes, was conducted on October 13, 2009 with the BLM and SRI representatives. The tribal representatives concurred with the eligibility of the

prehistoric sites under Section 106 and no other issues were identified within the previously analyzed ROW application area. Additional correspondence was sent informing the tribes of the public scoping meetings.

3.7.3.2 Tribal Consultation in Support of the Supplemental EIS

In support of the Supplemental EIS, additional tribal letters were sent on August 16, 2011 to the same six tribes:

- Chemehuevi Tribe
- Colorado River Indian Tribes
- Fort Mojave Indian Tribe
- Las Vegas Paiute Tribe
- Moapa Band of Paiutes
- Pahrump Paiute Tribe

Through in-person meetings and telephone conversations with the Las Vegas Tribe, the Chemehuevi Tribe, and the Fort Mojave Tribe, no concerns have been expressed for the proposed Project. The Moapa and Pahrump Tribes have concerns for how the tortoise habitat would be affected and the potential use of groundwater within the Project. The Colorado River Indian Tribes stated on September 6, 2012 that they would send a response to the BLM stating what their concerns might be but a response has not yet been received. There are no known sacred sites within the ROW application area.

3.8 PALEONTOLOGICAL RESOURCES

The paleontological resources in the regional area are described in *Section 3.8* in the 2010 Final EIS (BLM 2010). The ROI considered in detail in the 2010 Final EIS analyzed a 7,925-acre ROW application area at the base of the western slopes of the Lucy Gray Mountains, of which 7,387 acres are included in the current ROW application area. A summary of the Affected Environment description from the Final EIS is presented below, with updates as relevant for the expanded ROW application area.

Based on literature reviews and record searches conducted by CH2M Hill in 2009, the geology of the previously analyzed ROW application area corresponds to a Potential Fossil Yield Classification (PFYC) of Class 2 and Class 3b. A paleo-resource area classified as Class 2 is considered to be of low potential for paleontological resources, while Class 3b areas do not have enough information to make a determination, and can require pre-construction surveys. The Class 2 areas for the previously proposed project site are designated as Quaternary alluvium and this indicates that there is rapid movement of sediment from flowing water, which would likely have carried away any potential paleontological resources. Also, the sediments may be too young to yield fossils of scientific significance. Township 27 South, Range 59 East, Section 3, located in the southern extremity of Roach Dry Lake, is classified as a Class 3b paleo-resource area and is the only area of the previously analyzed ROW application area that was identified as having some potential for containing paleontological resources.

The 2010 Final EIS did not assess the paleontological sensitivity of 5,571 acres on the eastern margin of Roach Dry Lake and the west bajada of the Lucy Gray Range that are included in the new ROW application area analyzed in this Supplemental EIS. The sensitivity of this expanded ROW application area was analyzed in a separate study (CH2M Hill 2011), which indicated that most of the additional acreage in the ROW application area is underlain by sediment with a PFYC Class of 2 (low paleontological sensitivity). Although sediments on the eastern margin of Roach Dry Lake are designated PFYC Class 3b (unknown potential) at depth, a survey is not deemed necessary because no fossil material is expected to remain at or near the surface.

3.9 LANDS AND REALTY

This section summarizes the lands and realty section of the 2010 Final EIS, any changes since the Final EIS was completed, and any additional information needed to address the expanded ROW application area. The ROI for this section includes the entire 12,958-acre ROW application area, which is located on Federal lands managed by the BLM LVFO (Figure 3.9-1). The legal description of the land under ROW application is included in Table 3.9-1. The ROW application area for the Silver State Solar South Project is located approximately 2 miles east of Primm, Nevada and 40 miles south of Las Vegas, Nevada. The total ROW application area includes 7,387 acres of land analyzed in *Section 3.9 Lands and Realty* of the 2010 Final EIS.

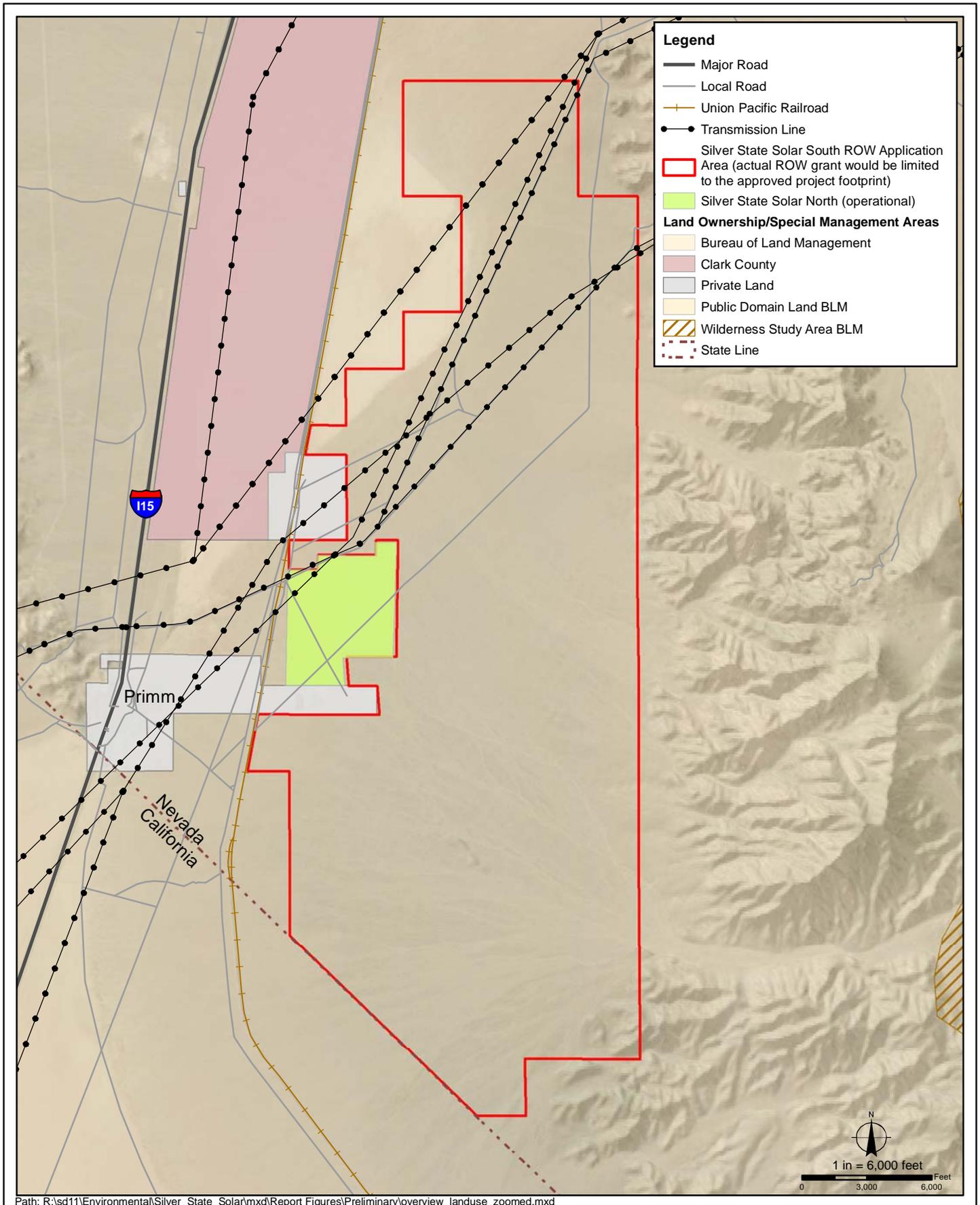
Table 3.9-1. Legal Description of ROW Application

Township*	Range*	Section(s)*
26S	59E	13, 14, 23, 24, 25, 26 27, 34, 35, 36
27S	59E	1, 2, 3, 9, 10, 11, 22, 23, 24, 25, 26, 27
*Mount Diablo Meridian		

The ROW application area is located along the west side of the Lucy Gray Mountains in the Mojave Desert and is bounded by the Union Pacific Railroad (UPRR) on the west and the California state border on the south. The northern border of the ROW application area is approximately 6 miles south of Jean, Nevada. The surrounding area includes the community of Primm and associated hotels and casinos, the Walter M. Higgins Generating Station, the Silver State Solar North facilities (currently under construction) the UPRR, Interstate 15, and the proposed Southern Nevada Supplemental Airport (SNSA).

The ROW application area is managed by the BLM Southern Nevada District Office and is located within the Jean /Roach Lake Special Recreation Management Area. Land uses within the ROW application area remain essentially the same as those described in the 2010 Final EIS and include electric utility and telephone ROWs, access roads, and recreation/OHV trails. Since the 2010 Final EIS was completed, the Silver State North solar facilities have been constructed. A list of both authorized and pending ROWs in the ROW application area is included in Table 3.9-2.

As noted in the 2010 Final EIS, the ROW application area is adjacent to the BLM patented 6,000-acre airport site which was transferred to Clark County in 2004. BLM and the Federal Aviation Administration were preparing an EIS for a proposed SNSA in Clark County, Nevada; however, the agencies have suspended work on the EIS. It is not known when work on the EIS will resume. The pending ROW application for the SNSA includes lands identified as airport



**Land Ownership in the ROW Application Area and Vicinity
Silver State Solar South Project**

**FIGURE
3.9-1**

Table 3.9-2. BLM ROW Grant Applications

Case Number	Township/Range	Right-of-Way Type	Status	Expiration
NVCC 018367	T27S, R59E Section 3 (S2NW)	McCullough-Victorville 500 kV Transmission Line	Authorized	Indefinite
NVCC 020824	T27S, R59E Section 3 (4)	Transmission Line	Authorized	Indefinite
NVN 039980	T27S, R59E Section 2 (4)	McCullough-Victorville 500 kV Transmission Line	Authorized	Indefinite
NVN 039980	T27S, R59E Section 3 (SWNE, SW)	McCullough-Victorville 500 kV Transmission Line	Authorized	Indefinite
NVN 039980	T27S, R59E Section 3 (1,2)	McCullough-Victorville 500 kV Transmission Line	Authorized	Indefinite
NVN 074211	T27S, R59E Section 3 (E2W2)	Transmission Line	Authorized	Indefinite
NVN 074211	T27S, R59E Section 3 (1,2)	Transmission Line	Authorized	Indefinite
NVN 074654	T27S, R59E Section 3 (E2W2)	Transmission Line	Authorized	11/14/11
NVN 074654	T27S, R59E Section 3 (1,2)	Transmission Line	Authorized	11/14/11
NVN 082824	T27S, R59E Section 3 (NWNE, SWNE, SENW, SESW, NESW)	Walter M. Higgins– Eldorado Interconnection 500 kV Transmission Line	Pending	
NVN 082824	T27S, R59E Section 3 (2)	Walter M. Higgins– Eldorado Interconnection 500 kV Transmission Line	Pending	
NVN 082825	T27S, R59E Section 3 (NWNE, SWNE, SENW, NESW, SESW)	Walter M. Higgins – Eldorado Interconnection 500 kV Transmission Line	Pending	
NVN 082825	T27S, R59E Section 3 (2)	Walter M. Higgins – Eldorado Optical Ground Wire Line	Pending	
NVN 085603	T27S, R59E Section 13 (All)	Solar Thermal Energy Facility Transmission Line	Pending	
NVN 085603	T27S, R59E Section 14 (All)	Solar Thermal Energy Facility Transmission Line	Pending	
NVN 085603	T27S, R59E Section 15 (All)	Solar Thermal Energy Facility Transmission Line	Pending	
NVN 085603	T27S, R59E Section 22 (N2, SE1/4, NE1/4 of SW1/4)	Solar Thermal Energy Facility Transmission Line	Pending	
NVN 085603	T27S, R59E Section 23 (All)	Solar Thermal Energy Facility Transmission Line	Pending	
NVN 085603	T27S, R59E Section 24 (All)	Solar Thermal Energy Facility Transmission Line	Pending	
NVN 085603	T27S, R59E Section 25 (N2)	Solar Thermal Energy Facility Transmission Line	Pending	

Table 3.9-2. BLM ROW Grant Applications (Continued)

Case Number	Township/Range	Right-of-Way Type	Status	Expiration
NVN 085603	T27S, R59E Section 26 (N2, NE1/4 of SW1/4, N2 of SE1/4, N2 of S2 of SE1/4)	Solar Thermal Energy Facility Transmission Line	Pending	
NVN 085603	T27S, R59E Section 27 (NE1/4 of NE1/4)	Solar Thermal Energy Facility Transmission Line	Pending	
NVN 04326501	T27S, R59E Section 2 (SWNW)	Mead Eldorado Transmission and Telephone Lines	Authorized	Indefinite
NVN 04326501	T27S, R59E Section 2 (3,4)	Mead Eldorado Transmission and Telephone Lines	Authorized	Indefinite
NVN 04326501	T27S, R59E Section 3 (SENE, N2SE, SWSE, SESW)	Mead Eldorado Transmission and Telephone Lines	Authorized	Indefinite
NVN 08282401	T27S, R59E Section 3 (NWNE, SWNE, SENW, SESW, NESW)	500 kV Transmission Interconnection	Pending	
NVN 08282401	T27S, R59E Section 3 (2)	500 kV Transmission Interconnection	Pending	
NVN 08282501	T27S, R59E Section 3 (NWNE, SWNE, SENW, NESW, SESW)	Optical Ground Wire Transmission Line	Pending	
NVN 08282501	T27S, R59E Section 3 (2)	Optical Ground Wire Transmission Line	Pending	
NVN 088003	T27S, R59E Section 3 (S2, NE1/4, S2 of NW1/4, S2 of NE1/4 of NW1/4)	Ivanpah Supplemental Airport Withdrawal and Transfer for a Noise Compatibility Area on map titled, "Clark County Conservation of Public Land and Natural Resources Act of 2002"	Authorized	Indefinite

environs overlay district and flood control lands which overlap the Silver State South ROW application area. These overlapping areas include T.26S, R.59E Sections 14, 23, 26, 27, and 34, and T.27S, R.59E Sections 9 and 10.

The 2010 Final EIS identified four mining claims within the previously analyzed ROW application area. These claims are discussed in detail in *Section 3.17, Energy and Minerals* of the Final EIS. The 5,571 acres of ROW application area not previously analyzed includes two additional mining claims, which are addressed in *Section 3.17, Energy and Minerals*.

3.10 SPECIAL MANAGEMENT AREAS

Special Management Areas (SMA) in the ROW application area and surrounding region are described in *Section 3.11* in the 2010 Final EIS (BLM 2010) and summarized below. For the purposes of this study, SMAs within 10 miles of the ROW application area were identified. No changes in status of SMAs have occurred since the 2010 Final EIS was completed.

As noted in the 2010 Final EIS, BLM SMAs are lands which possess unique and important historical, anthropological, ecological, biological, geological, and paleontological features. These SMAs are designated by an Act of Congress or Presidential Proclamation, or created under BLM administrative procedures.

The ROW application area is located entirely within the Jean/Roach Lake Special Recreation Management Area (SRMA) (Figure 3.10-1). A detailed discussion of this SRMA is in *Section 3.11.1.1* of the 2010 Final EIS and *Section 3.11* of this Supplemental EIS.

While the ROW application area does not include any Areas of Critical Environmental Concern (ACEC), Desert Wildlife Management Areas (DWMA), National Preserves, or BLM Wilderness Areas, these types of SMA are in the vicinity. The SMAs located within 10 miles of the ROW application area were described in the 2010 Final EIS and are presented in Table 3.10-1.

Table 3.10-1. Special Management Areas Near the ROW Application Area

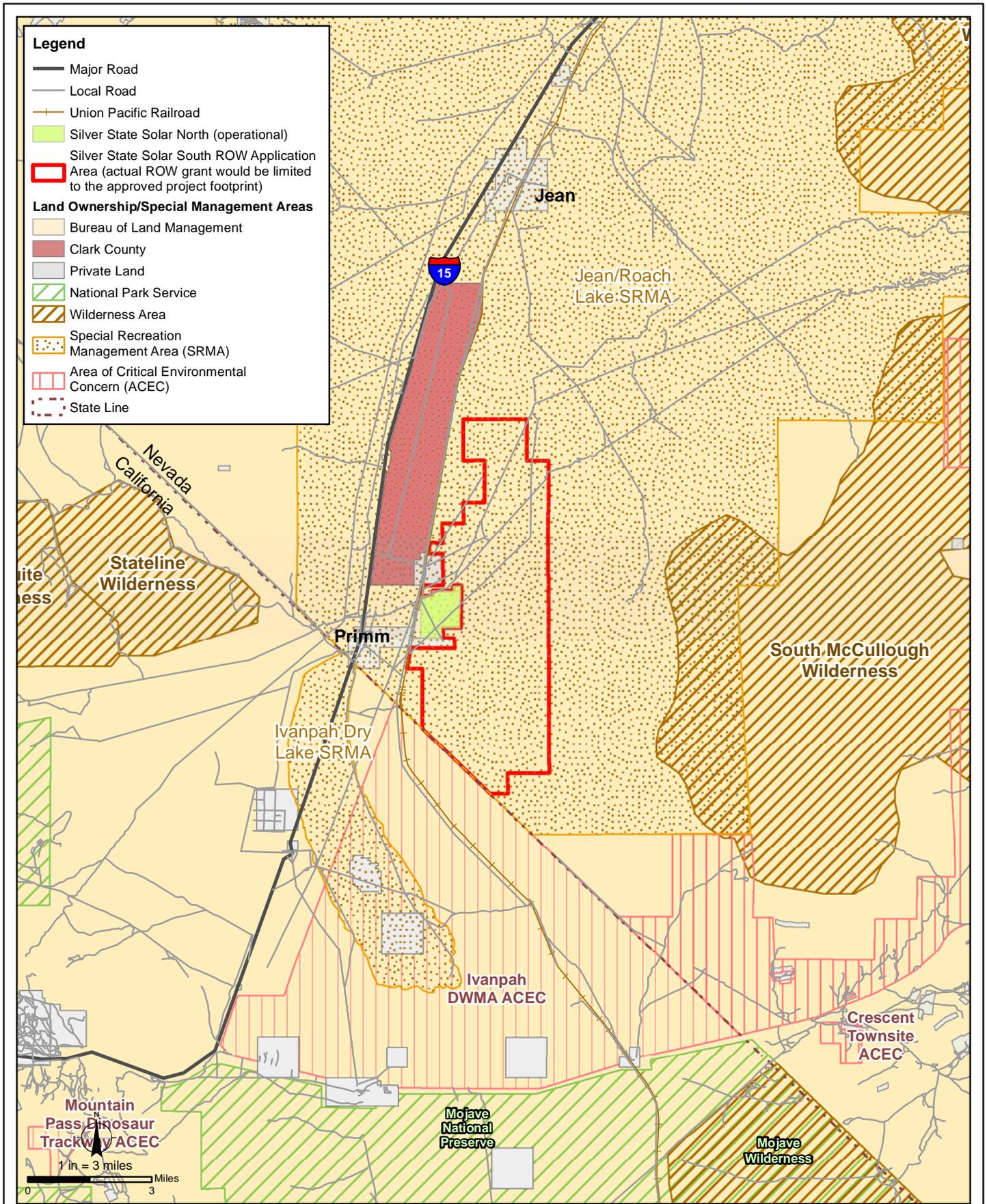
Special Management Area	Location	Distance from ROW Application Area
Jean/Roach Lake SRMA	Clark County, Nevada	ROW application area located within Jean/Roach Lake SRMA
Ivanpah DWMA/ACEC	San Bernardino County, CA	1 mile to the south
Ivanpah Dry Lake SRMA	San Bernardino County, CA	2 miles to the southwest
South McCollough Wilderness Area	Clark County, Nevada	3 mile to the east
Piute-Eldorado Valley DWMA/ACEC	Clark County, Nevada	5 miles to the southeast
Stateline Wilderness Area	San Bernardino County, CA	6 miles to the west
Mojave National Preserve	San Bernardino County, CA	7 miles to the south
Mesquite Wilderness Area	San Bernardino County, CA	8 miles to the west
Crescent Townsite ACEC	Clark County, NV	9 miles to the southeast

3.11 RECREATION

This section includes a summary of the recreation section included in the 2010 Final EIS, any changes since the 2010 Final EIS was completed, and any additional information needed to address the expanded ROW application area. The ROI for recreation is considered to be 5 miles to include direct and indirect impacts. As identified in the 2010 Final EIS, two recreation areas are located within 5 miles of the ROW application area: the Ivanpah Dry Lake SRMA and the Jean/Roach Lake SRMA. The Ivanpah Dry Lake SRMA is located in San Bernardino, California approximately 2 miles from the ROW application area. A description of this SRMA can be found in section 3.11.3 of the 2010 Final EIS. The Jean/Roach Lake SRMA is described below.

3.11.1 Jean/Roach Lake Special Recreation Management Area

The ROW application area is located within the 216,300-acre Jean/Roach Lake SRMA. The Jean/Roach Lake SRMA is managed by the BLM “for intensive recreation opportunities,



**Special Management Areas
Silver State Solar South Project**

**FIGURE
3.10-1**

including competitive OHV races (in accordance with the USFWS Biological Opinion) and other recreational events, as well as dispersed recreational use and commercial activities” (BLM 1998). Other recreational activities include recreational OHV use, model rocket launching, filming of movies, commercials, and music videos, rock climbing, dog trial training, mountain biking, target shooting, hang-gliding and para-gliding, hunting, horseback riding events, hiking, music festivals, and land sailing. Hunting within the Jean/Roach Lake SRMA occurs primarily within the mountain areas, including the Lucy Grays. The 12,958-acre ROW application area occurs within hunting Unit 263 and includes quail hunting, 7 bighorn sheep tags and 19 mule deer tags (Units 261 through 268).

OHV recreation within the Jean/Roach Lake SRMA includes competitive organized events, commercial tours, and dispersed recreation. Figure 3.11-1 shows trails and roads used for these recreation activities.

3.11.2 Special Recreation Permits and OHV Racing

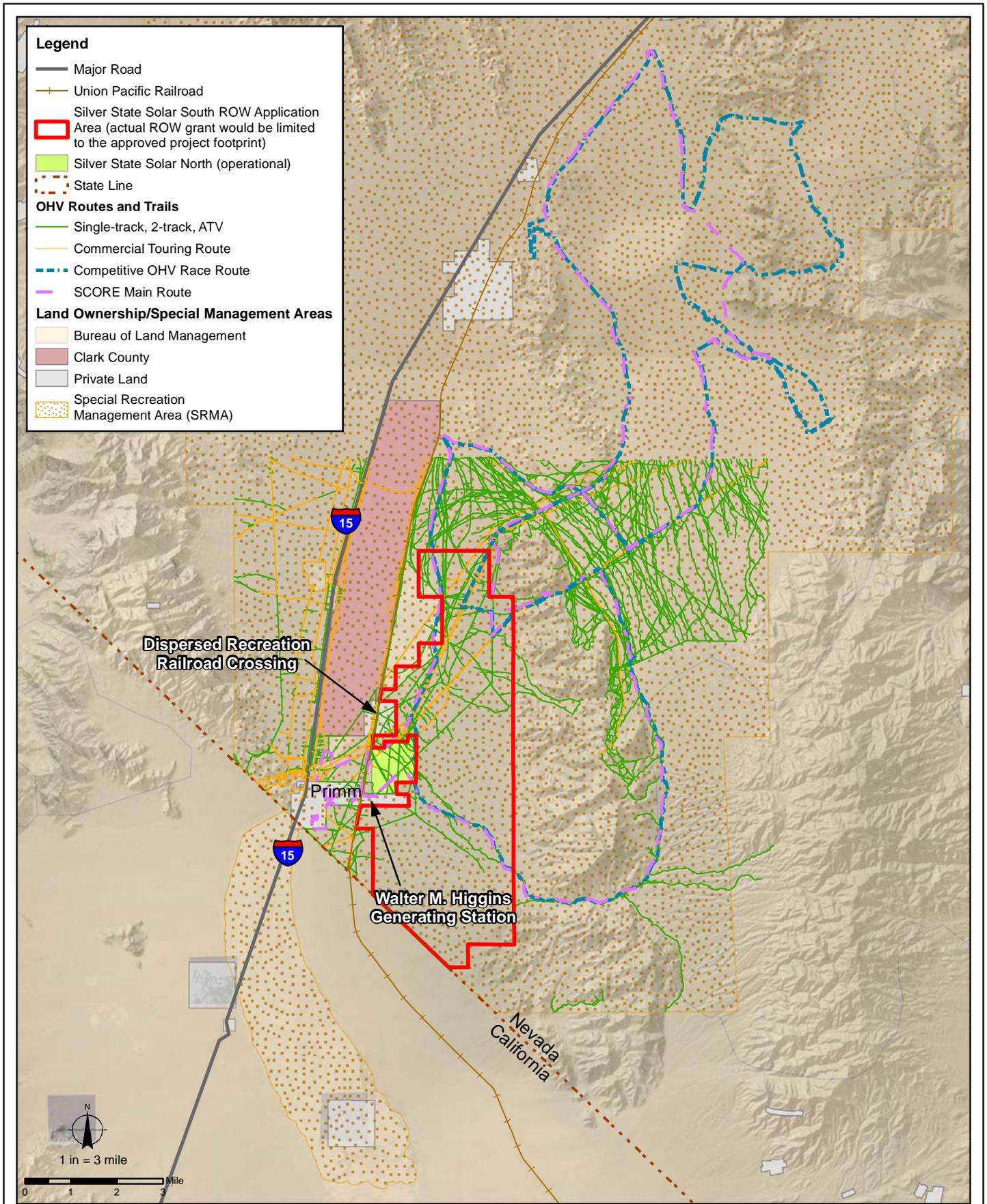
Special recreation permits are required by the BLM for competitive organized OHV racing events within the Jean/Roach Lake SRMA. These permits are typically applied for six months in advance of the event. OHV high speed events are restricted during tortoise active periods and typically occur during the winter and summer months. A biological assessment and consultation with the USFWS must be completed before each race event. Competitive organized OHV races average approximately 8,000 visitors per event, with some events bringing over 20,000 per event (Peterson 2012). Table 3.11-1 includes races which were granted a special recreation permit in the Jean/Roach Lake SRMA from 2009 to 2011. Based on the historical use of the SRMA for competitive organized OHV racing, BLM anticipates that these races will continue into the future.

3.11.3 Commercial OHV Tours

Commercial touring companies use the Jean/Roach Lake SRMA to lead OHV tours. Currently, two companies are permitted to operate in the Jean/Roach Lake SRMA: Vegas Off-Road Experience (VORE), and American Adventure Tours (Dieli, 2011). The routes used for commercial tours are included in Figure 3.11-1. Commercial touring visitation within the Jean/Roach Lake SRMA is approximately 15,000 visits per year (Peterson 2012).

3.11.4 Dispersed Recreation

Dispersed recreation makes up the majority of recreational use in the Jean/Roach Lake SRMA (Dieli 2011). In fiscal year 2011, the Jean/Roach Dry Lakes SRMA has 249,904 visits and 85,223 visitor days (Dieli 2011). Many of the dispersed recreation users are OHV enthusiasts. These visitors typically access the eastern portion of the SRMA from a UPRR crossing approximately one mile north of Primm. From this access point, they follow OHV trails to gain access to the Lucy Grays and other areas of the SRMA.



**Off-Highway Vehicle Routes
Silver State Solar South Project**

**FIGURE
3.11-1**

Table 3.11-1. Organized Races in the Jean/Roach Lake SRMA, 2009-2012

	2009	2010	2011	2012
Race (month)	SNORE Battle at Primm (February)	SNORE Battle at Primm (February)	SNORE Battle at Primm (February)	HDRA Redline @ Stateline (January)
	Best in the Desert (April)	Motorcycle Racing Association of Nevada – four events	BITD MINT 400 (March)	SNORE Battle at Primm (February)
	Motorcycle Racing Association of Nevada – three events (June, July, and August)	SCORE-International Primm 300 (September)	Motorcycle Racing Association of Nevada – four events	BITD MINT 400 (March)
	SCORE-International Primm 300 (September)	Seed 9 Rally (November)	Seed 9 Rally (November)	Motorcycle Racing Association of Nevada – four events
	SNORE 250 at Primm (October)	Best in the Desert Henderson Classic (December)	Best in the Desert Henderson Classic (December)	HDRA Night Race (August)
	Best in the Desert Henderson Classic (December)			Seed 9 Rally (November)
				Best in the Desert Henderson Classic (December)

3.12 VISUAL RESOURCES

The visual resources in the regional area are described fully in Section 3.8 in the 2010 Final EIS and are summarized in this document. The Region of Influence (ROI) for visual resources was based on the viewshed analysis, which encompassed up to 15 miles (background distance zone) from the ROW application area. Given the margin of change between the ROW application areas for the previously analyzed Silver State Solar Project and the Silver State Solar South Project, the BLM has determined that the visual resource inventory prepared previously for the Final EIS is sufficient to characterize the affected environment for this project. Consistent with the Final EIS for the Silver State Solar Project and BLM's guidelines for visual resource management (VRM), the affected environment for visual resources considers visual character, the agency's visual resource inventory, key observation points (KOPs), and visual resource management objectives.

3.12.1 Visual Character

The ROW application area is located entirely within the Basin and Range physiographic province in southeast Nevada (Fenneman 1931). This landscape is characterized by its isolated, roughly parallel mountain ranges separated by closed (undrained) desert basins. The mountain ranges often run 50 to 70 miles in length and generally traverse north to south.

The ROW application area and adjacent lands primarily consists of a natural setting represented by five distinct landscape character types: desert mountains, desert foothills, alluvial fans or bajadas, playas, and xero-riparian areas. The desert mountains are characterized by their rugged and rocky slopes and exposed peaks and faces. Mountains surrounding the ROW application area include the Lucy Gray and McCullough Mountains to the east, the Clark and Spring Mountains to the west, and the New York and Ivanpah Mountains to the south. Surrounding the base of these mountain formations and extending into the desert plains are alluvial fans. The fans are characterized by gently rolling or sloping terrain, dissected by dry washes, and exhibit rocky, tan soils. Vegetation diversity tends to increase along ephemeral water courses and are more distinctive than the typically, even-vegetated alluvial fans and desert basins. The alluvial fans slope down to two playas that contribute to the visual character of the area; the Ivanpah and Roach Playas. For a detailed description of the visual character, see Section 3.12.2 in the 2010 Final EIS.

3.12.2 BLM Visual Resource Inventory and Objectives

The visual resource inventory (VRI) is an inventory of scenic values and consists of Scenic Quality Rating Units, Sensitivity Level Rating Units, and Distance Zones. The BLM VRM system requires this inventory and establishment of management objectives for those values through the visual resource management planning process. Based on the issuance of BLM Instruction Memorandum No. 2009-167 (BLM 2009), a completed VRI is required to serve as part of the baseline for NEPA analyses on BLM land. In this regard, the VRI used for the 2010 Final EIS were deemed appropriate for the Proposed Action per agency consultation (Chandler 2011).

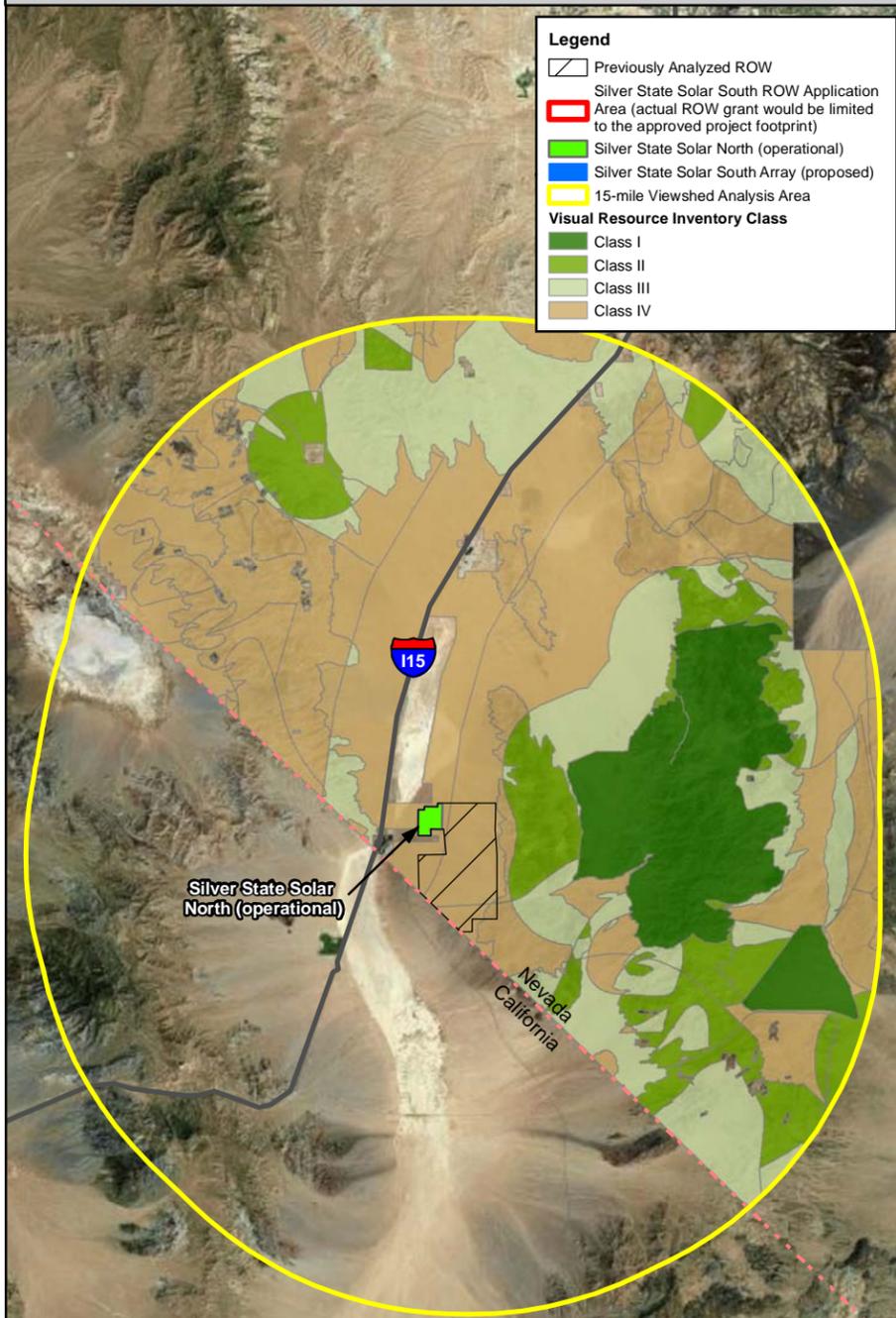
3.12.2.1 Visual Resource Inventory and Classes

Visual Resource Inventory Classes (VRIC) are derived by combining the VRI components described below (i.e. Scenic Quality, Sensitivity Levels, and Distance Zones); and represent the inventoried scenic values of landscapes administered by the BLM. VRIC range from Class I, being the most valued, to Class IV, being the least valued, per BLM's VRM policy (BLM Manual H-8410-1 – Visual Resource Inventory). The Silver State Solar South Project would be located on VRIC IV lands (Figure 3.12-1 Visual Resource Inventory).

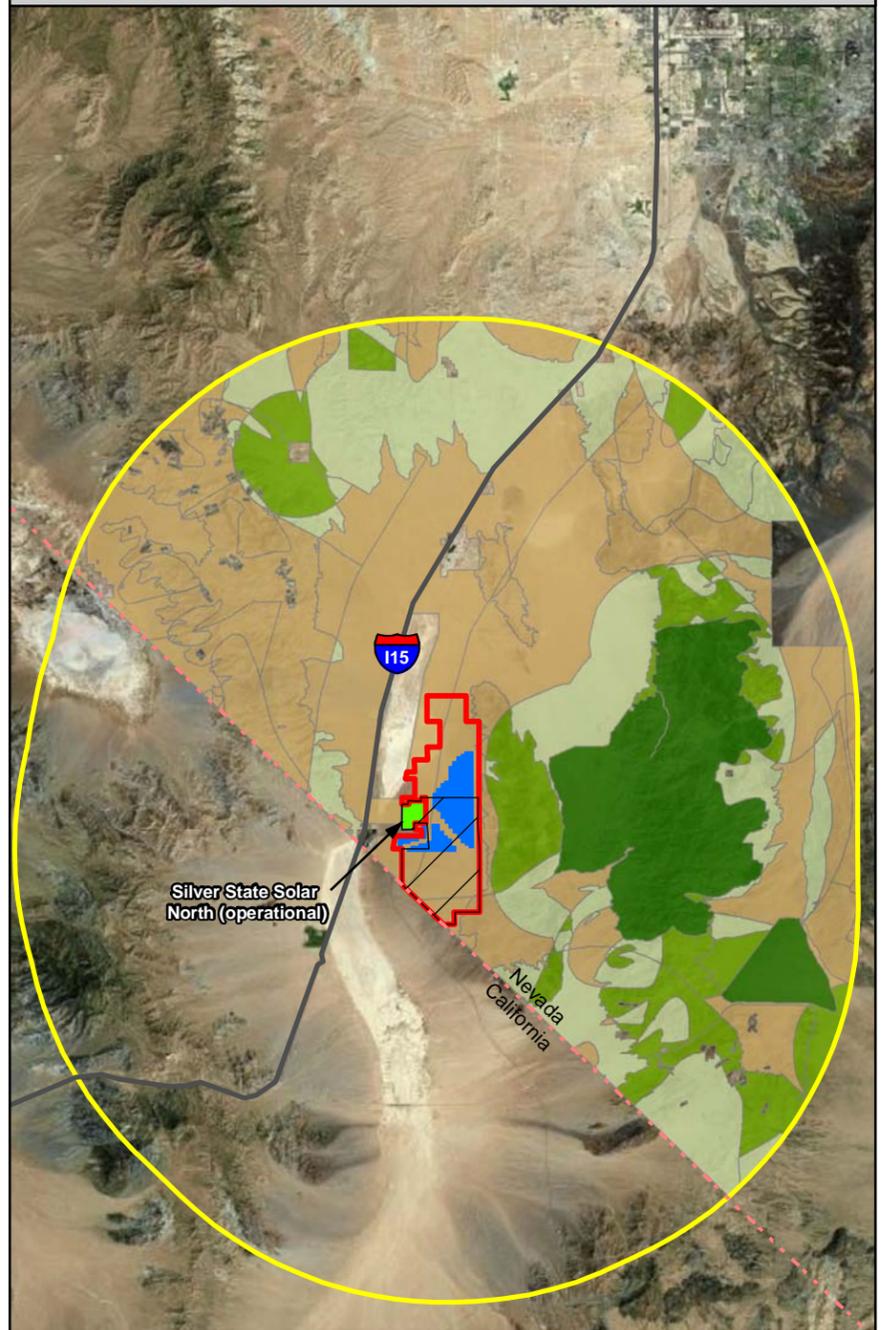
Scenic Quality

The BLM defines *scenic quality* as the measure of the visual appeal of a tract of land. In the VRI process, public land is given an A, B, or C rating, based on the evaluation of the following seven key factors: landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modifications. The ROW application area is located within a Class C Scenic Quality Rating Unit characterized by subtle landforms, even vegetation distribution with minimal diversity (*as compared to the region*), and minimal influence of water (Figure 3.12-2 - Scenic Quality Rating). The adjacent Lucy Gray Mountains and Ivanpah and Roach Playas add diversity to this common Basin and Range landscape. The presence of the Walter M. Higgins Generating Station, existing transmission line corridor(s) and the partially constructed Silver State Solar North

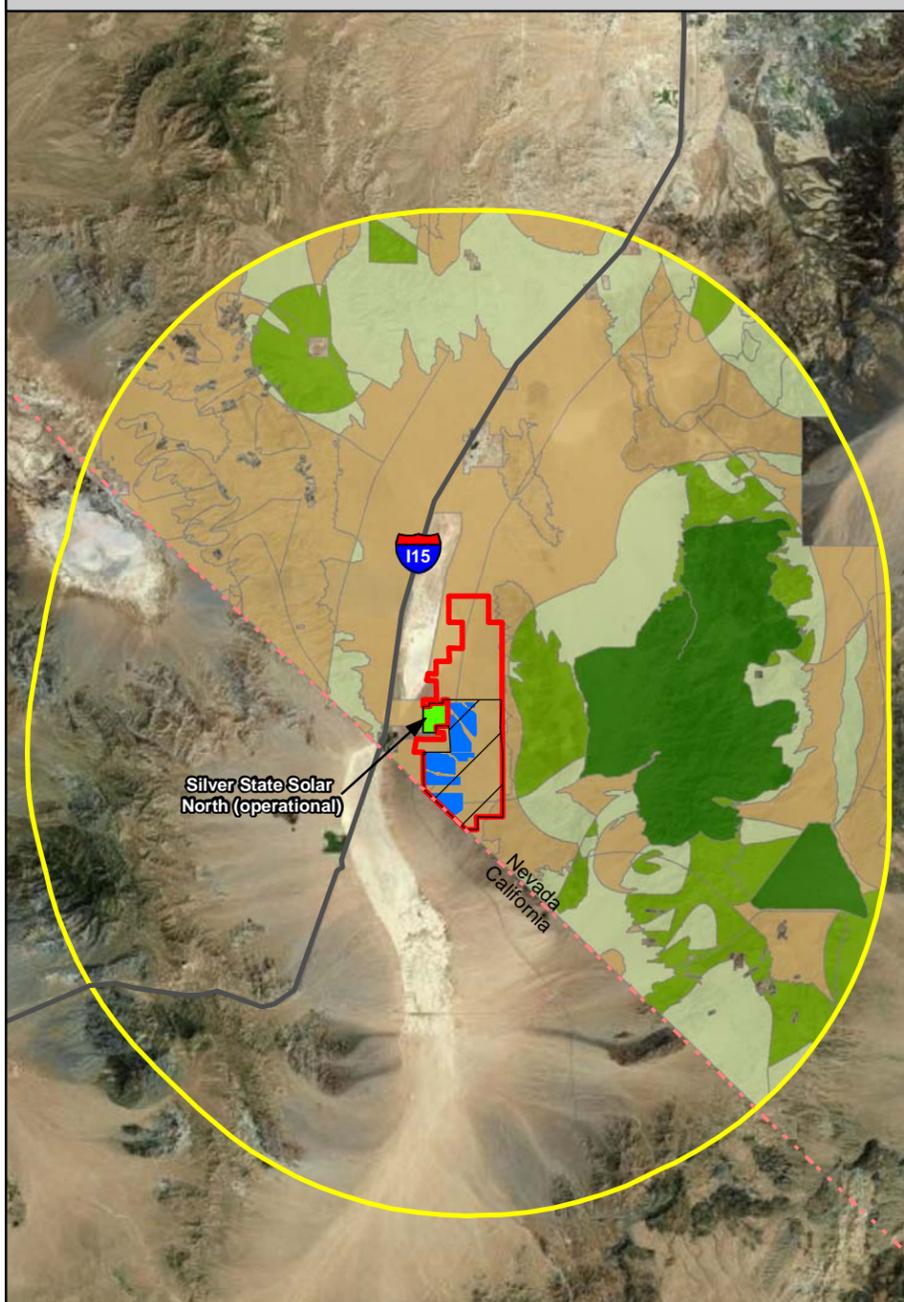
Alternative A - No Project



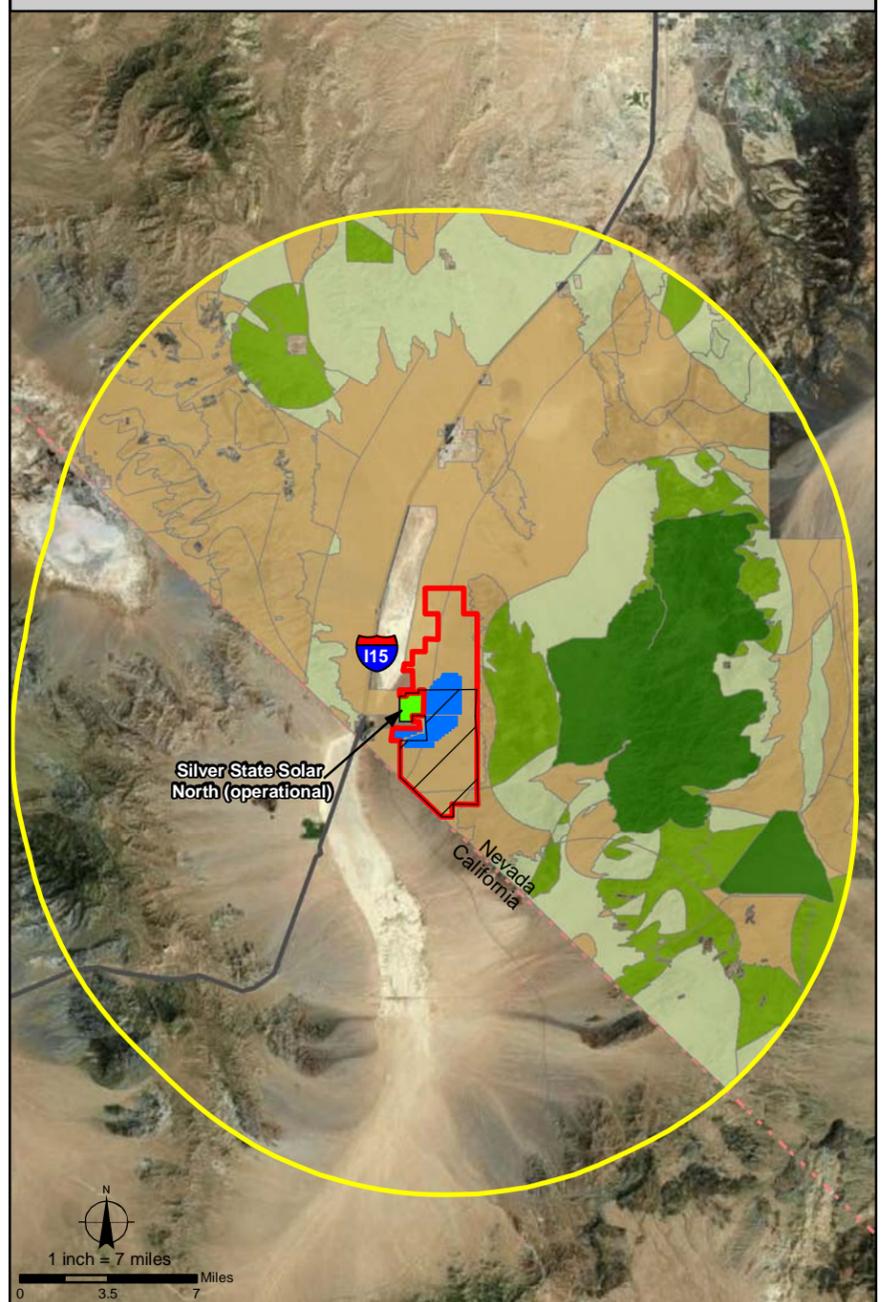
Alternative B



Alternative C



Alternative D



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**Visual Resource Inventory Classifications
Alternatives A, B, C & D
Silver State Solar South Project**

**FIGURE
3.12-1**

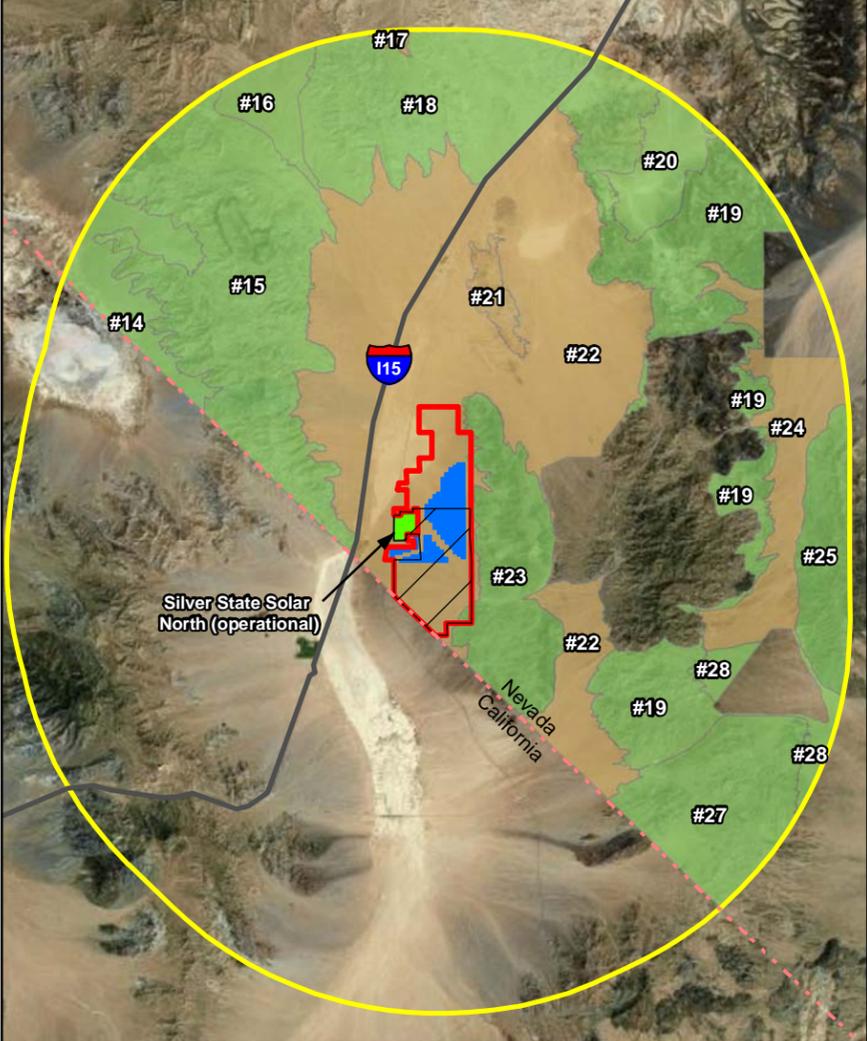
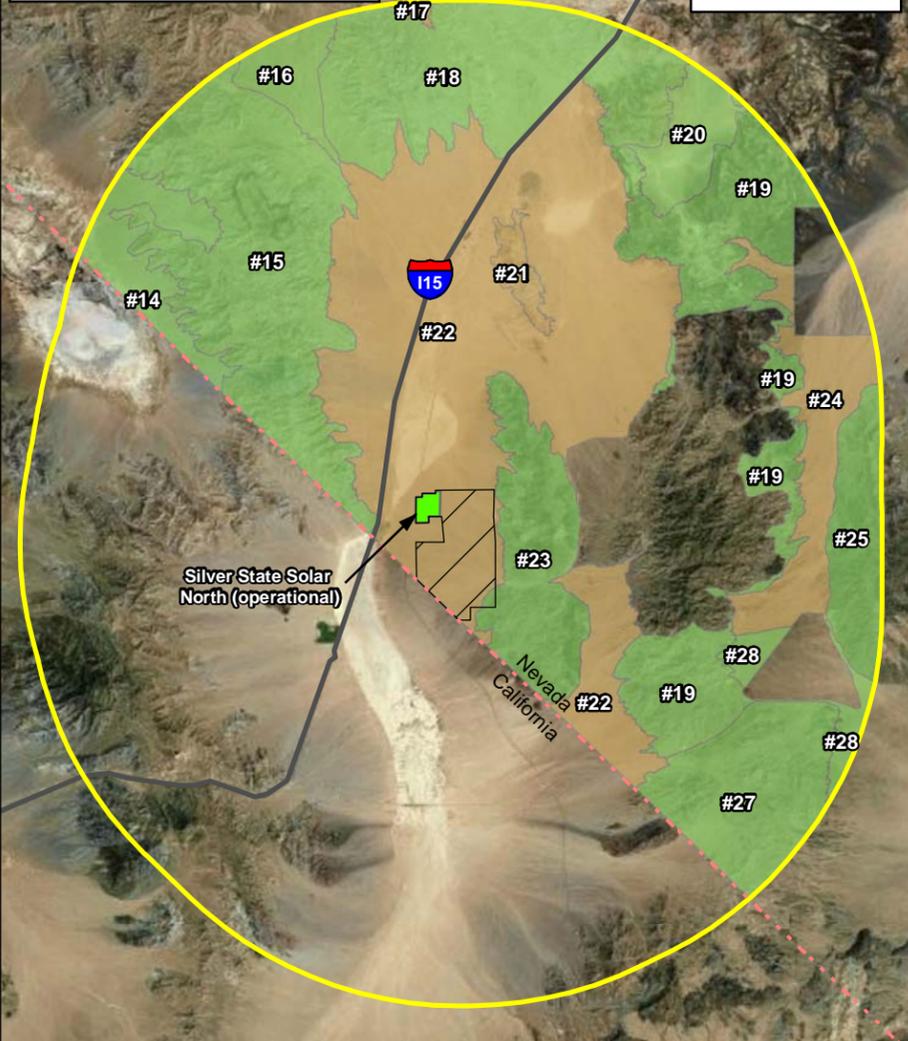
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Alternative A - No Project

Alternative B

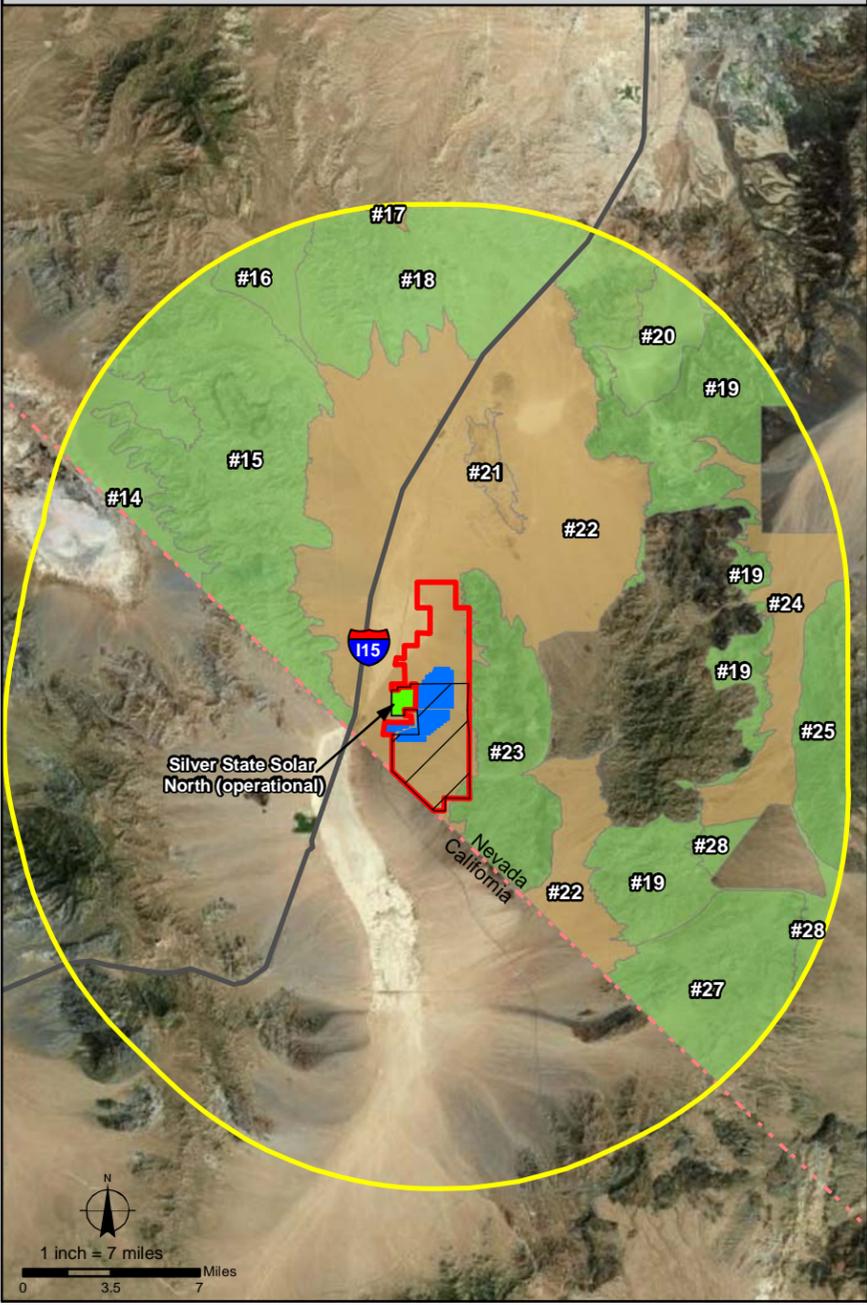
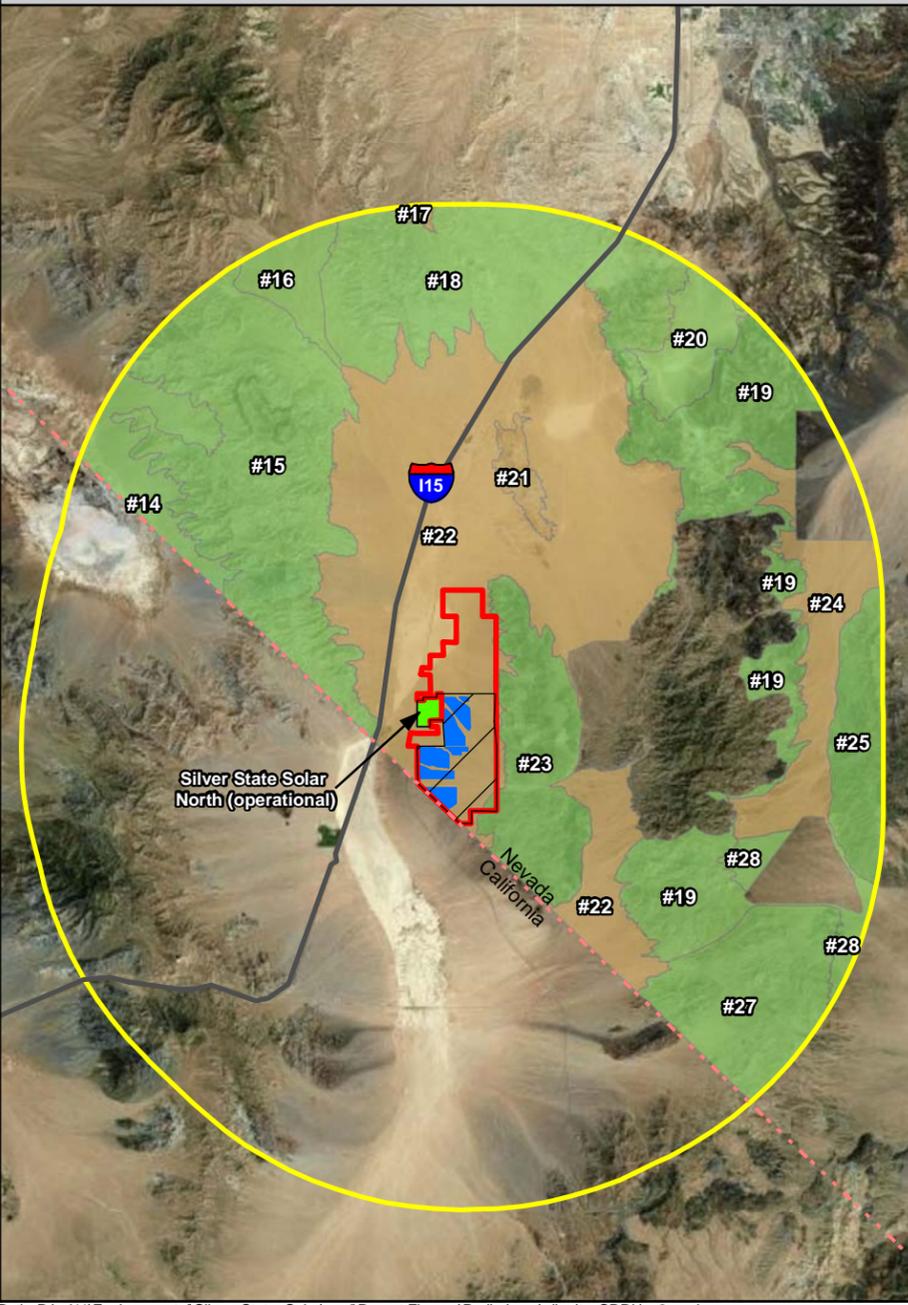
- Legend**
- ◻ Previously Analyzed ROW
 - ◻ Silver State Solar South ROW Application
 - ◻ Area (actual ROW grant would be limited to the approved project footprint)
 - ◻ Silver State Solar North (operational)
 - ◻ Silver State Solar South Array (proposed)
 - ◻ 15-mile Viewshed Analysis Area
- Scenic Quality Rating**
- ◻ Class B
 - ◻ Class C

- Scenic Quality Rating Units**
- 14 - Mesquite Valley
 - 15 - Spring Mountains
 - 16 - Goodsprings Valley
 - 17 - Las Vegas Valley
 - 18 - Bird Spring
 - 19 - McCullough Range
 - 20 - Hidden Valley
 - 21 - Sheep Mountain
 - 22 - **Ivanpah Valley**
 - 23 - Lucy Gray Mountains
 - 24 - Eldorado Valley
 - 25 - Highland Range
 - 27 - New York Mountains
 - 28 - Piute Valley



Alternative C

Alternative D



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**Scenic Quality Rating
Alternatives A, B, C & D
Silver State Solar South Project**

**FIGURE
3.12-2**

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Project have substantially modified the existing setting associated with the Silver State Solar South Project as compared to the baseline conditions for the 2010 Final EIS.

Sensitivity Level Rating Units

Sensitivity Level Rating Units represent the public's concern for the maintenance of scenic quality associated with a given landscape. Public lands are assigned high, medium, or low sensitivity by analyzing the various indicators of public concern, including type of user, amount of use, public interest, adjacent land uses, and special areas, among other factors. Based on managed recreation that occurs on the Roach Playa and adjacent Lucy Gray Mountains, particularly organized OHV races, the BLM has determined that the sensitivity of the area is low to moderate (see Figure 3.12-3 - Sensitivity Level Rating).

Distance Zones

Distance Zones represent how a particular landscape is viewed from public viewing areas and typically include, but are not limited to, residential areas, recreation areas, trails, highways and publicly accessible agency-managed roads. As defined by the BLM, distance zones are characterized as foreground/middle ground (0-3 to 5 miles), background (5-15 miles), and seldom seen (15 miles and beyond and screened by topography). Primarily because of the close proximity to the community of Primm and I-15, the land in which the Silver State Solar South Project would be located was assessed within the foreground/middle ground distance zone (see Figure 3.12-4 - Distance Zones).

3.12.3 Key Observation Points (KOPs)

KOPs are used to identify and disclose impacts to the public and determine compliance with VRMC. A viewshed analysis was conducted using the Proposed Action and alternatives (Figure 3.12-5 – Viewshed) within the ROI to determine if the KOPs identified and analyzed in section 3.12.4 of the 2010 Final EIS were still relevant. Based on the results of this analysis, it was determined that the KOPs used to characterize effects within the 2010 Final EIS would be appropriate for the Proposed Action and Alternatives with the following two exceptions: KOP 3 was moved from the south side of Roach Lake to the middle of the lake to better document the recreation viewshed associated with the lakebed area and another KOP from an OHV trail overlook was added (KOP 10). The following KOPs were used in this Supplemental EIS to assess effects of the project on the sensitive viewers and demonstrate compliance with the Las Vegas RMP, (LVRMP LUP). For a detailed description and characterization of the original KOPs, see Section 3.12.4.2 of the 2010 Final EIS.

- KOP 1 - View from Goodsprings Road
- KOP 2 - View from I-15 near Jean
- KOP 3 - View from the center of Roach Dry Lake Bed
- KOP 4 - View from Desert Oasis Apartment Complex
- KOP 5 - View from Primm Valley Resort and Casino
- KOP 6 - View from Lucy Gray OHV Trail
- KOP 7 - View from Ivanpah Dry Lake Bed
- KOP 8 - View from I-15 at Nipton Road Overpass
- KOP 9 - View from Entrance to Mojave National Preserve
- KOP 10 - View from Communications Tower Overlook

3.12.4 BLM Visual Resource Management Classes/Objectives

BLM Visual Resource Management Classes (VRMC) and their associated objectives define levels of acceptable visual change (contrast) allowed on BLM administered land, and range from Class I to Class IV. VRMC are designated by the BLM, based in part on the inventoried scenic values (VRI) and other land use allocation decisions that are made during the resource management planning process. BLM VRMC are used to demonstrate compliance with applicable RMP Land Use Plans (LUP) and also provide guidance in regard to mitigation. The proposed Silver State Solar South Project would be located on BLM lands designated as VRMC III, which has the following objective:

“...to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape...”

Figure 3.12-6 depicts the VRMC in context within the ROW Application area.

3.13 TRANSPORTATION/MOTORIZED VEHICLE ACCESS

The ROI for Transportation/Motorized Vehicle Access includes all existing routes that provide access to and within the full 12,958-acre ROW application area. The discussion of traffic routes in Section 3.13 of the 2010 Final EIS includes these routes and applies to the proposed Silver State Solar South Project analyzed in this Supplemental EIS. Competitive OHV races that traverse the roads, trails, and washes of the Project Area, are described in Section 3.11 of the 2010 Final EIS.

The ROW application area is located in a largely undeveloped area and, therefore, major transportation routes are limited. Traffic routes within the ROW application area are limited to unpaved off-highway vehicle roads, trails, and dry washes. Interstate (I)-15 provides indirect access to the area from the urban centers of Southern California, such as San Diego and the greater Los Angeles area from the south, and Salt Lake City and Las Vegas from the north. Available data for I-15 indicate that nearby segments of the traffic route are operating at Level of Service (LOS) D (high-density, but stable traffic flow) and LOS E (at or near the capacity level with reduced speeds). East Primm Boulevard provides east-west direct access from I-15, South Las Vegas Boulevard/Nevada State Route (SR) 604, and Desert Arena Drive. Nearby segments of East Primm Boulevard operate at LOS A (free flow of traffic) and LOS C (within range of stable traffic flow), while no data is available for South Las Vegas Boulevard/SR 604.

Alternative A - No Project

Alternative B

Legend

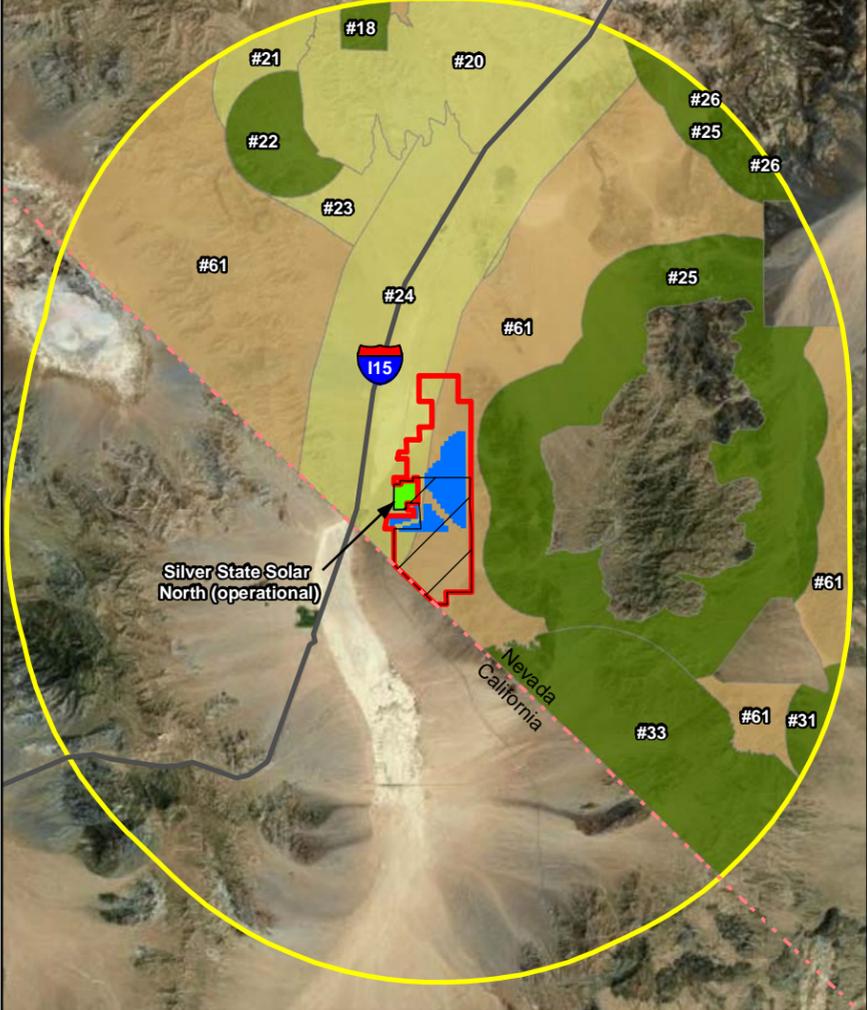
- Previously Analyzed ROW
- Silver State Solar South ROW Application Area (actual ROW grant would be limited to the approved project footprint)
- Silver State Solar North (operational)
- Silver State Solar South Array (proposed)
- 15-mile Viewshed Analysis Area

Sensitivity Level Rating Unit

- 18 - Red Rock Canyon National Conservation Area
- 20 - Bird Spring
- 21 - Cottonwood Valley Road
- 22 - Goodsprings Historic Mining Community
- 23 - SR 161 (Sandy Valley to Jean)
- 24 - I-15 (Las Vegas to Primm)
- 25 - McCullough Range Wilderness Area
- 26 - Sloan Canyon National Conservation Area
- 31 - Walking Box Ranch
- 33 - Mojave National Preserve Viewshed
- 61 - Not Delineated

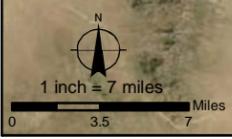
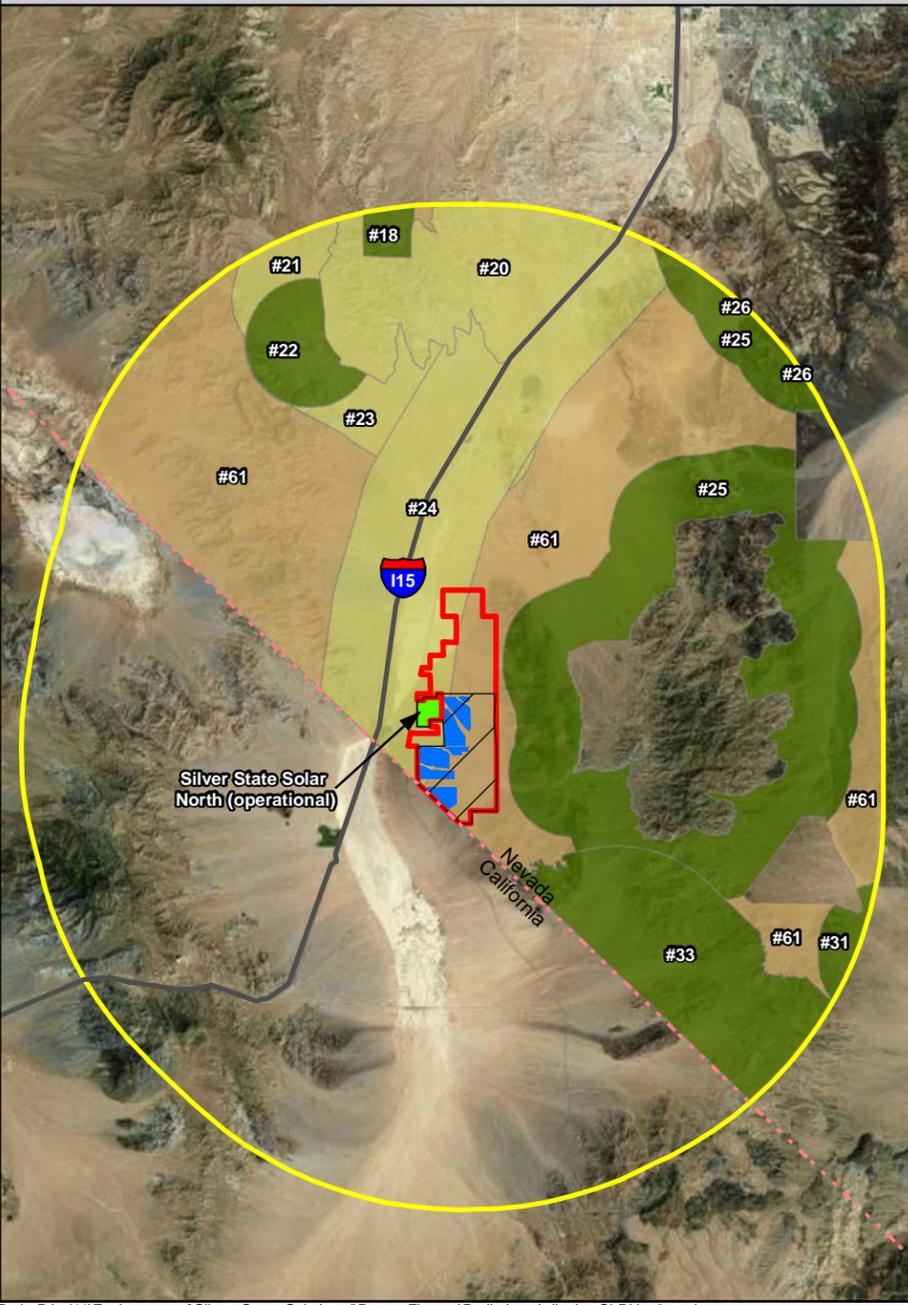
Sensitivity Level Rating Unit

- Low
- Moderate
- High



Alternative C

Alternative D



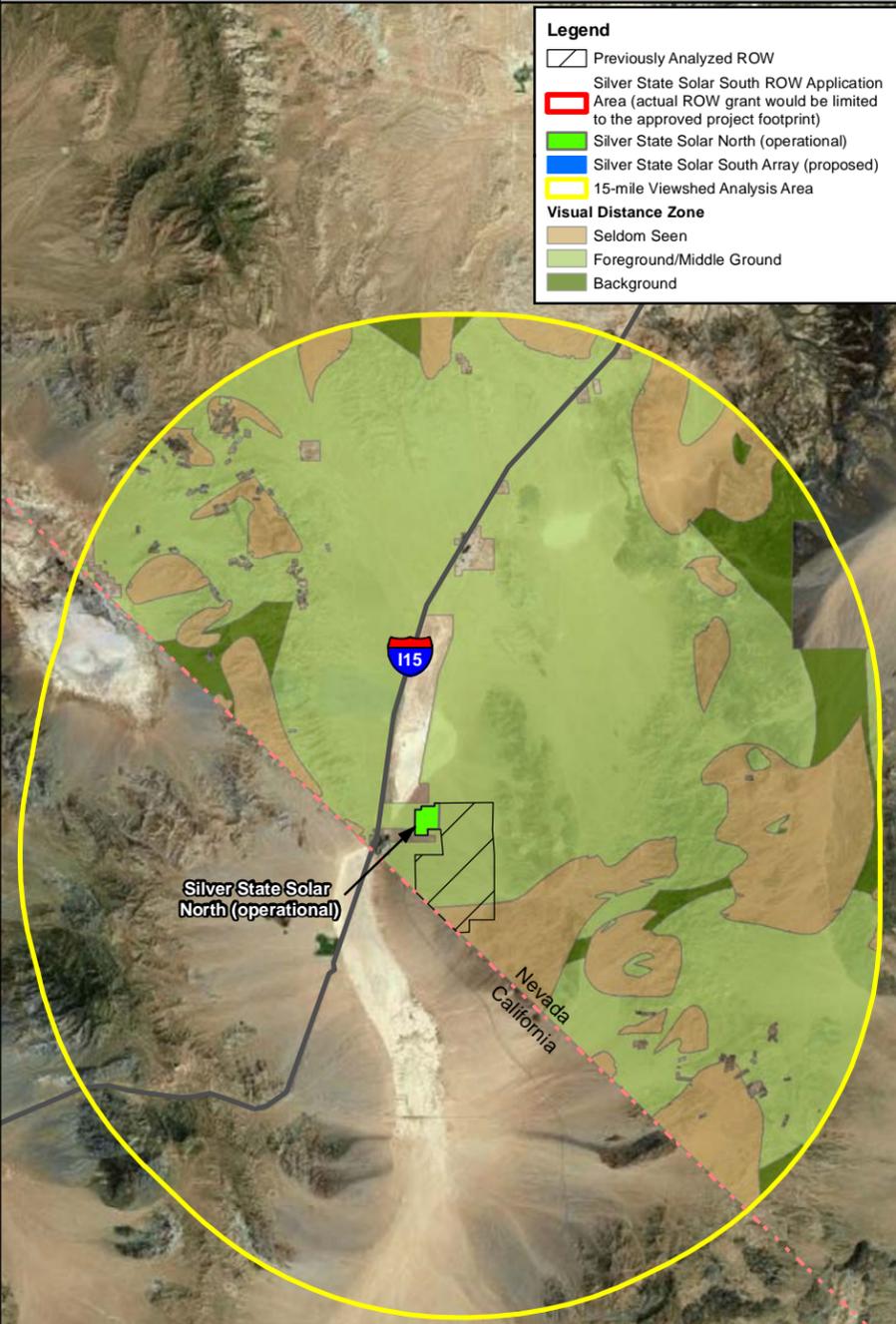
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**Sensitivity Level Rating
Alternatives A, B, C & D
Silver State Solar South Project**

**FIGURE
3.12-3**

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Alternative A - No Project



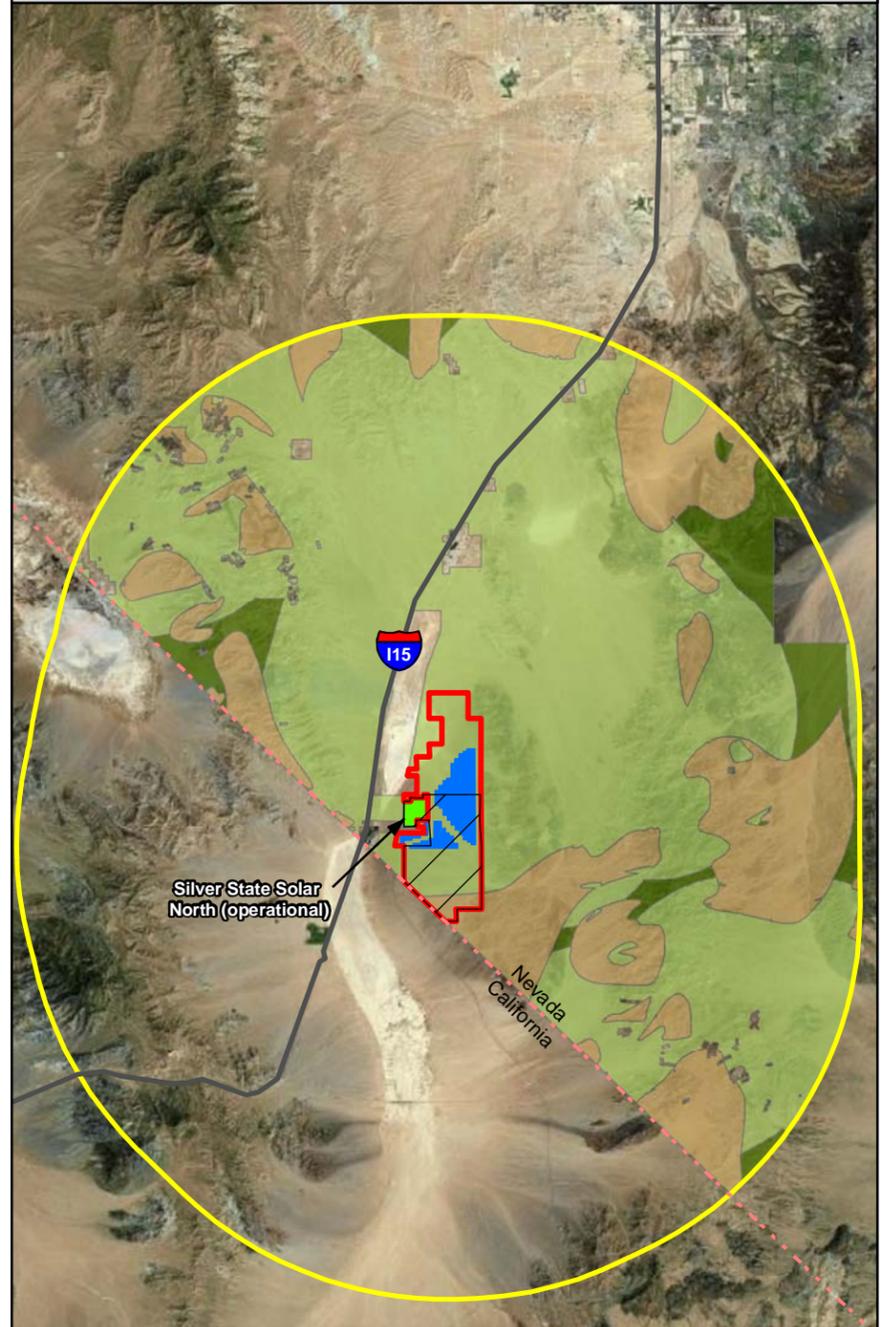
Legend

- Previously Analyzed ROW
- Silver State Solar South ROW Application Area (actual ROW grant would be limited to the approved project footprint)
- Silver State Solar North (operational)
- Silver State Solar South Array (proposed)
- 15-mile Viewshed Analysis Area

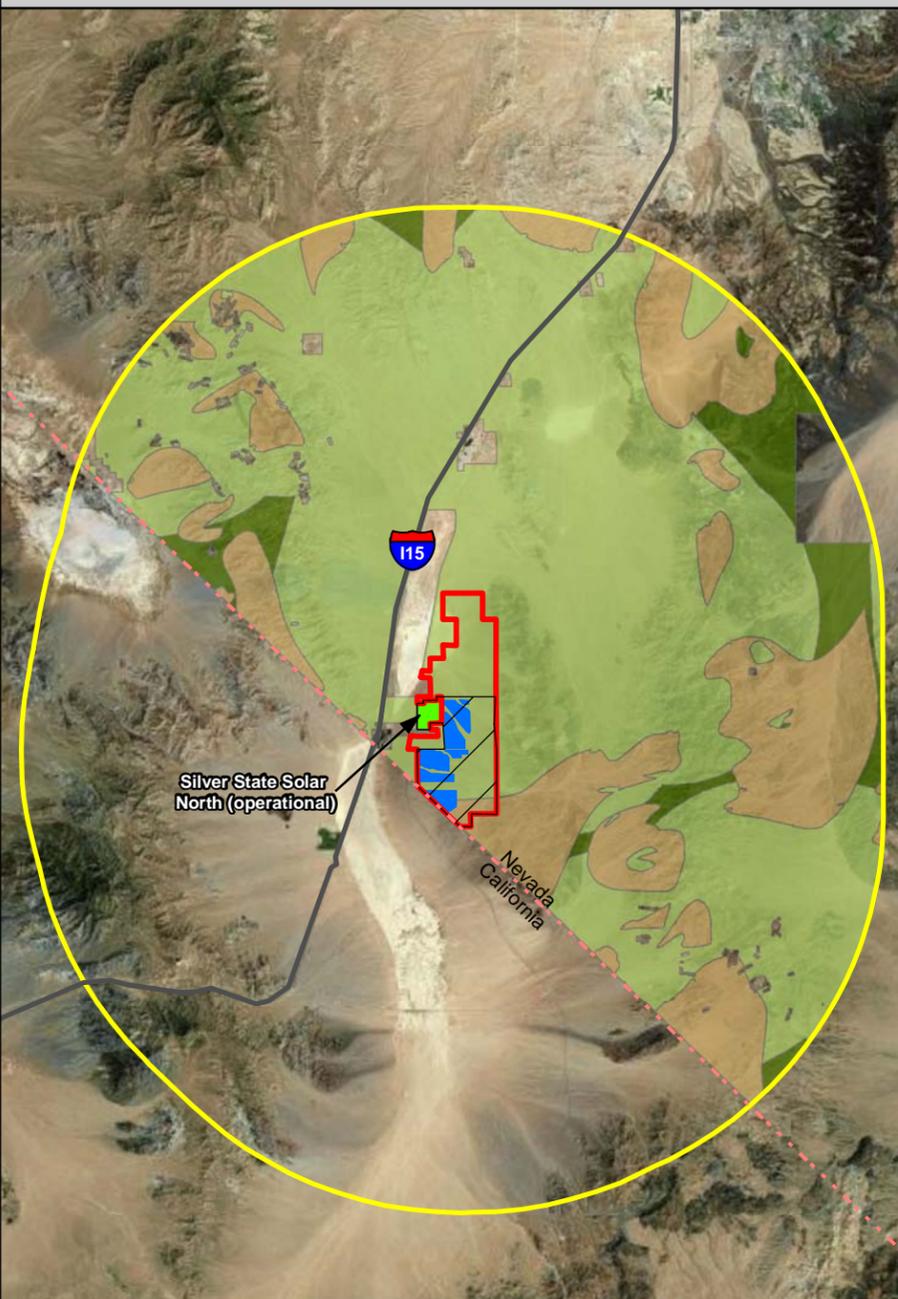
Visual Distance Zone

- Seldom Seen
- Foreground/Middle Ground
- Background

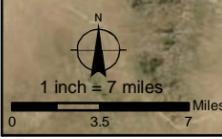
Alternative B



Alternative C



Alternative D



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**Distance Zones
Alternatives A, B, C & D
Silver State Solar South Project**

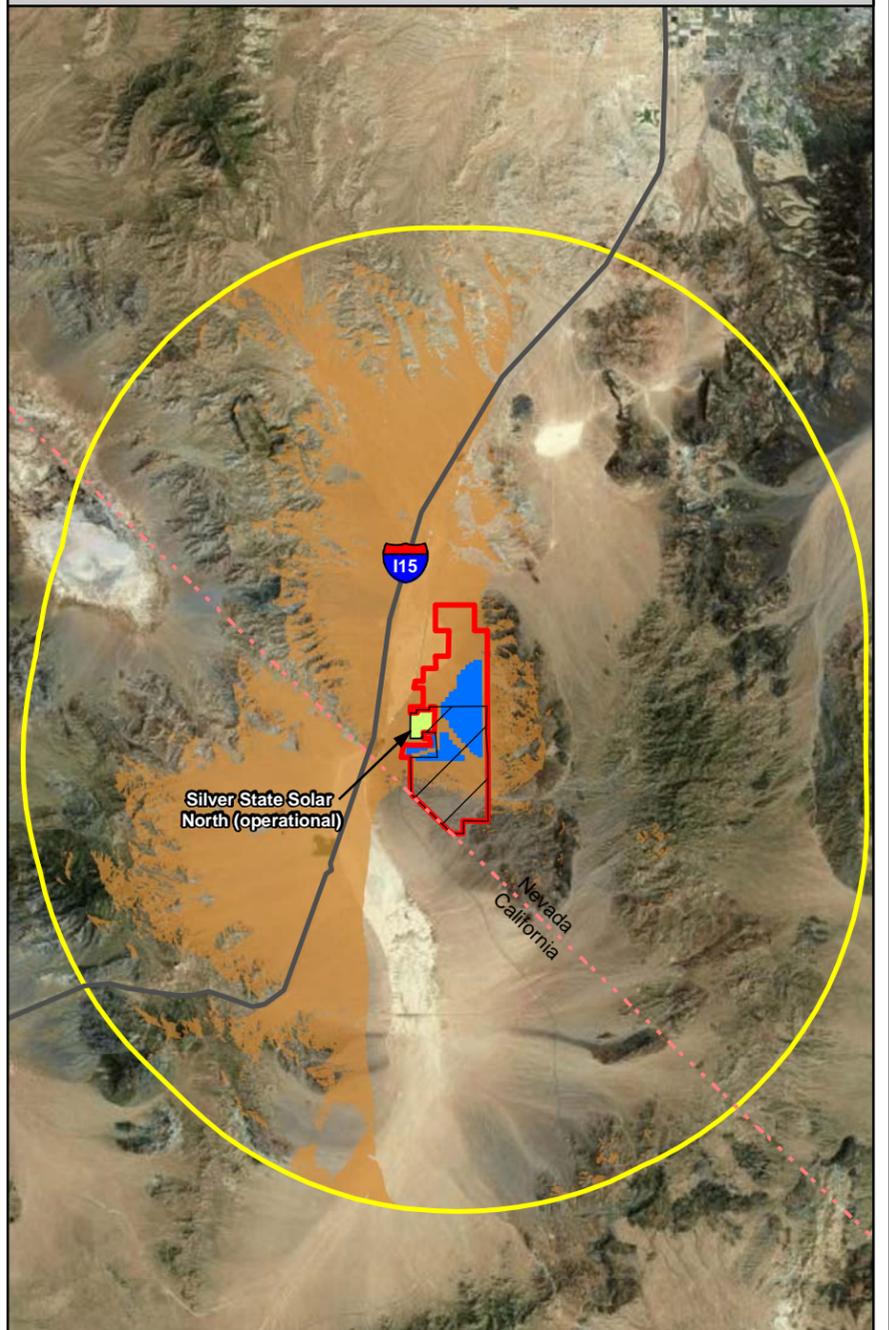
**FIGURE
3.12-4**

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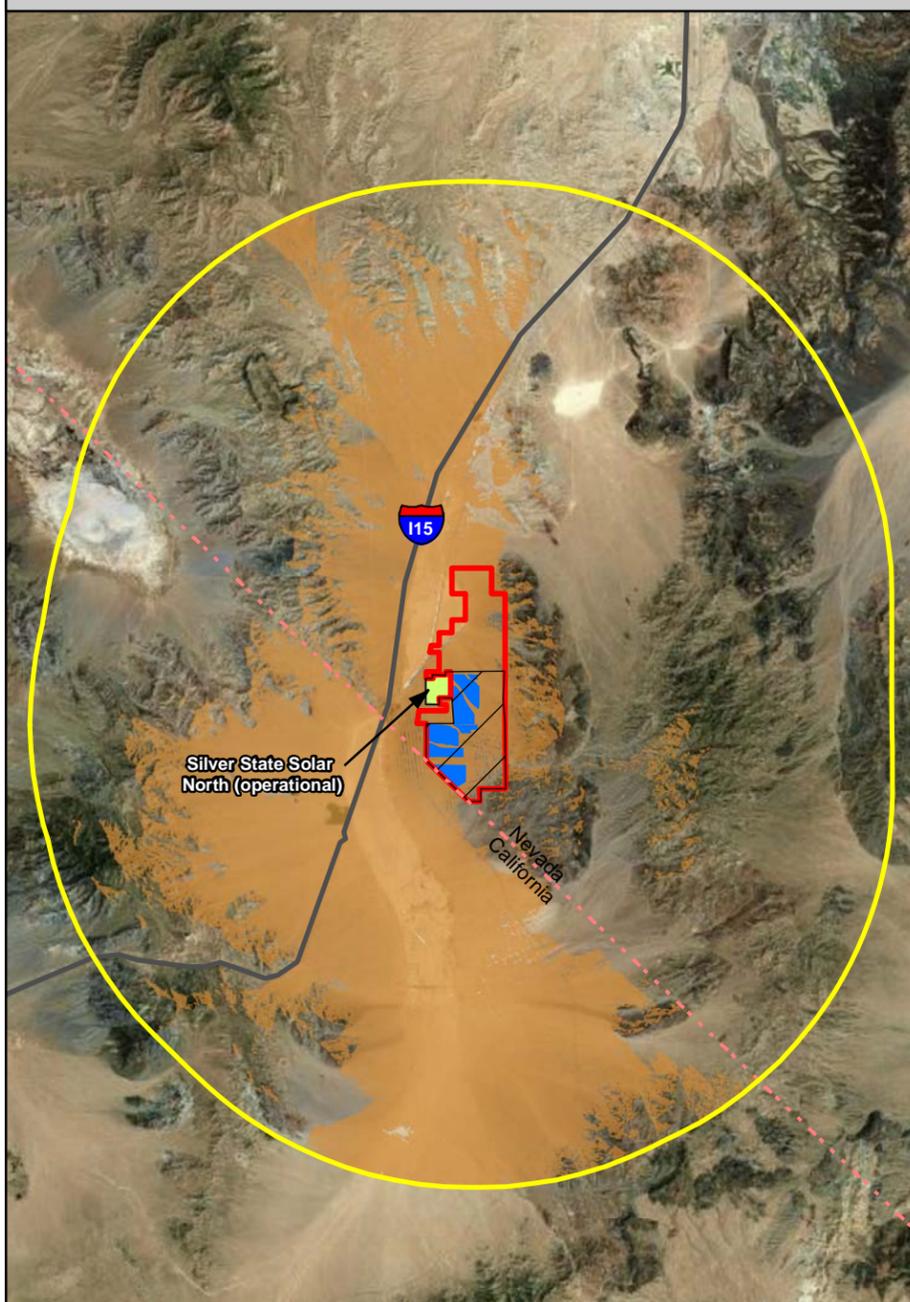
Alternative A - No Project



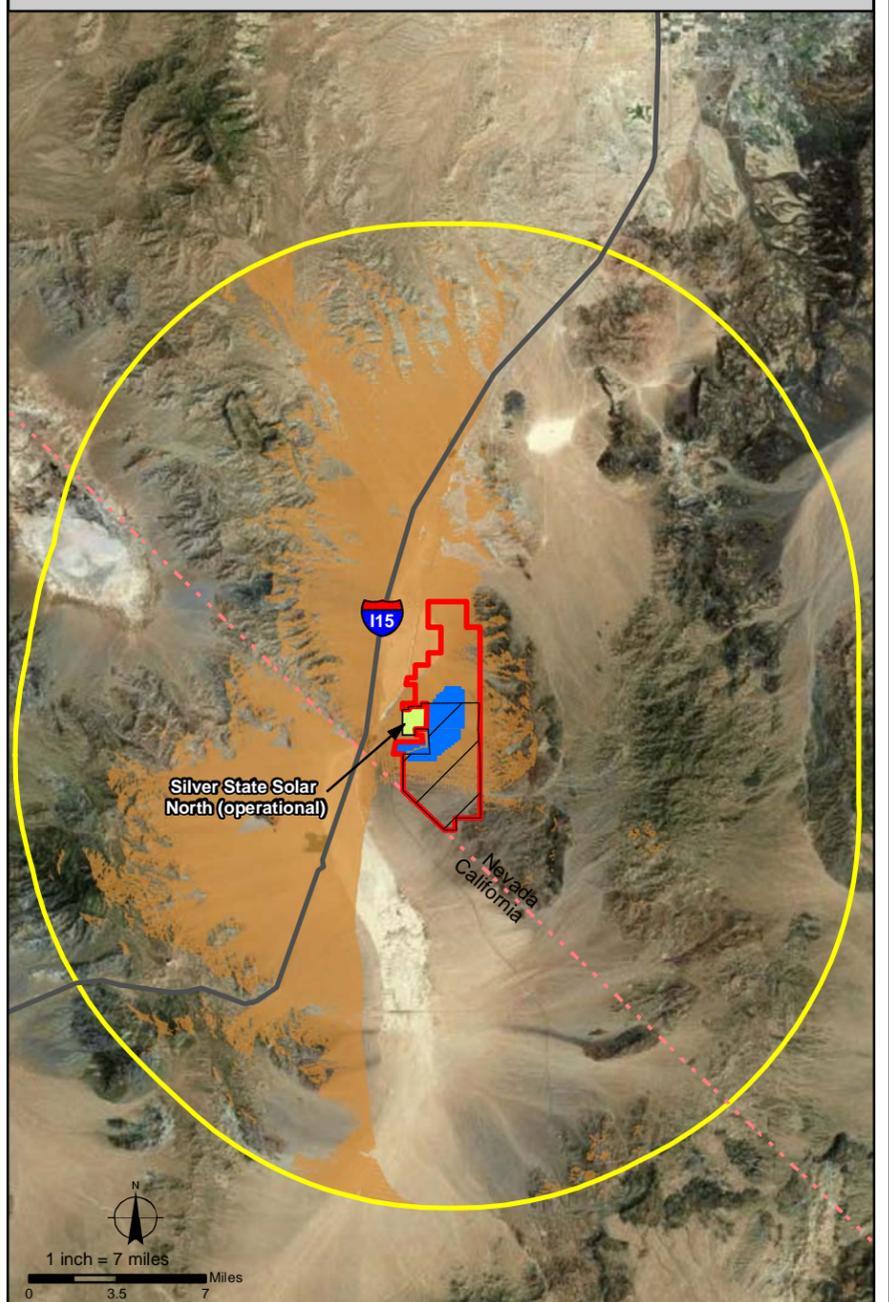
Alternative B



Alternative C



Alternative D



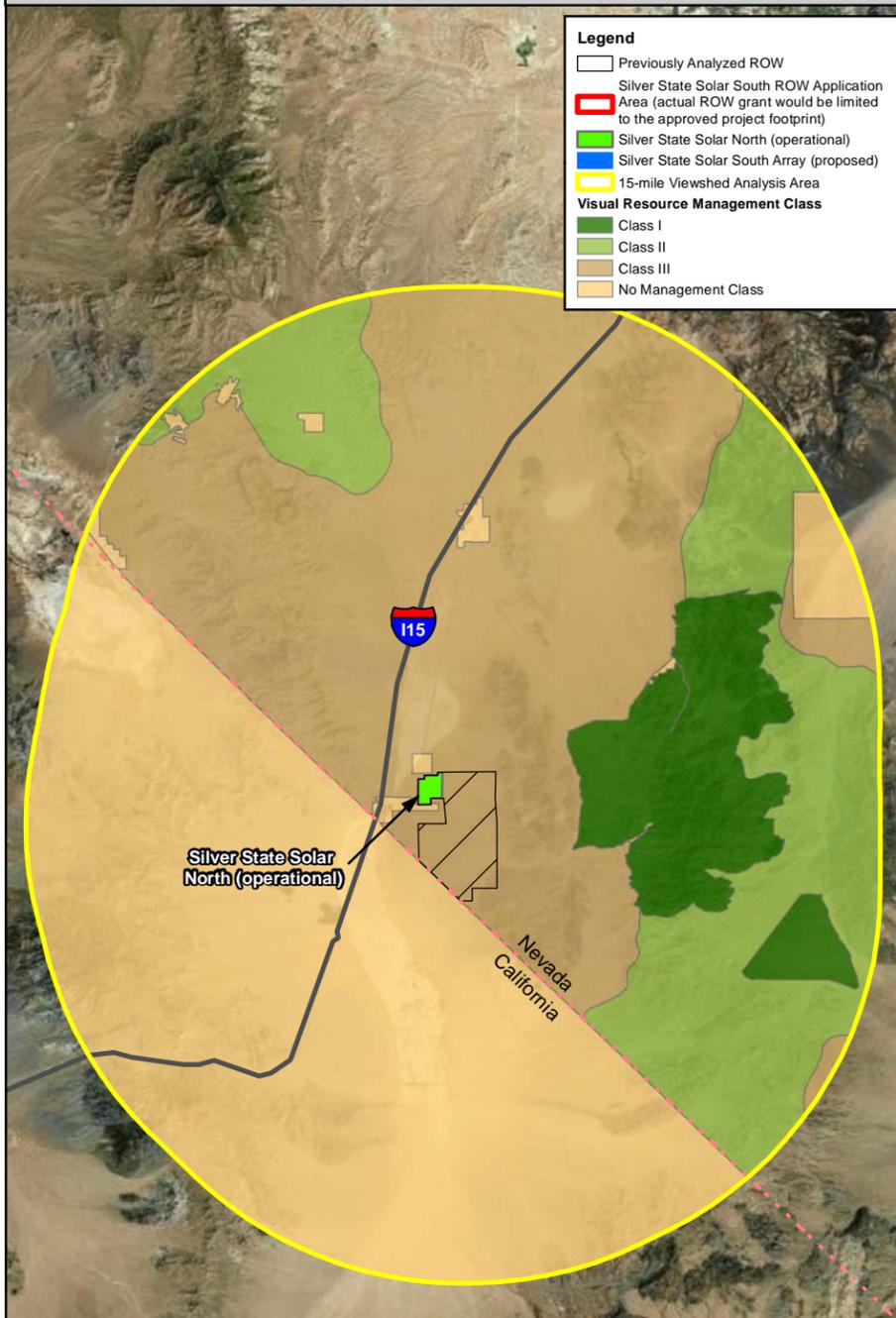
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**Viewshed
Alternatives A, B, C & D
Silver State Solar South Project**

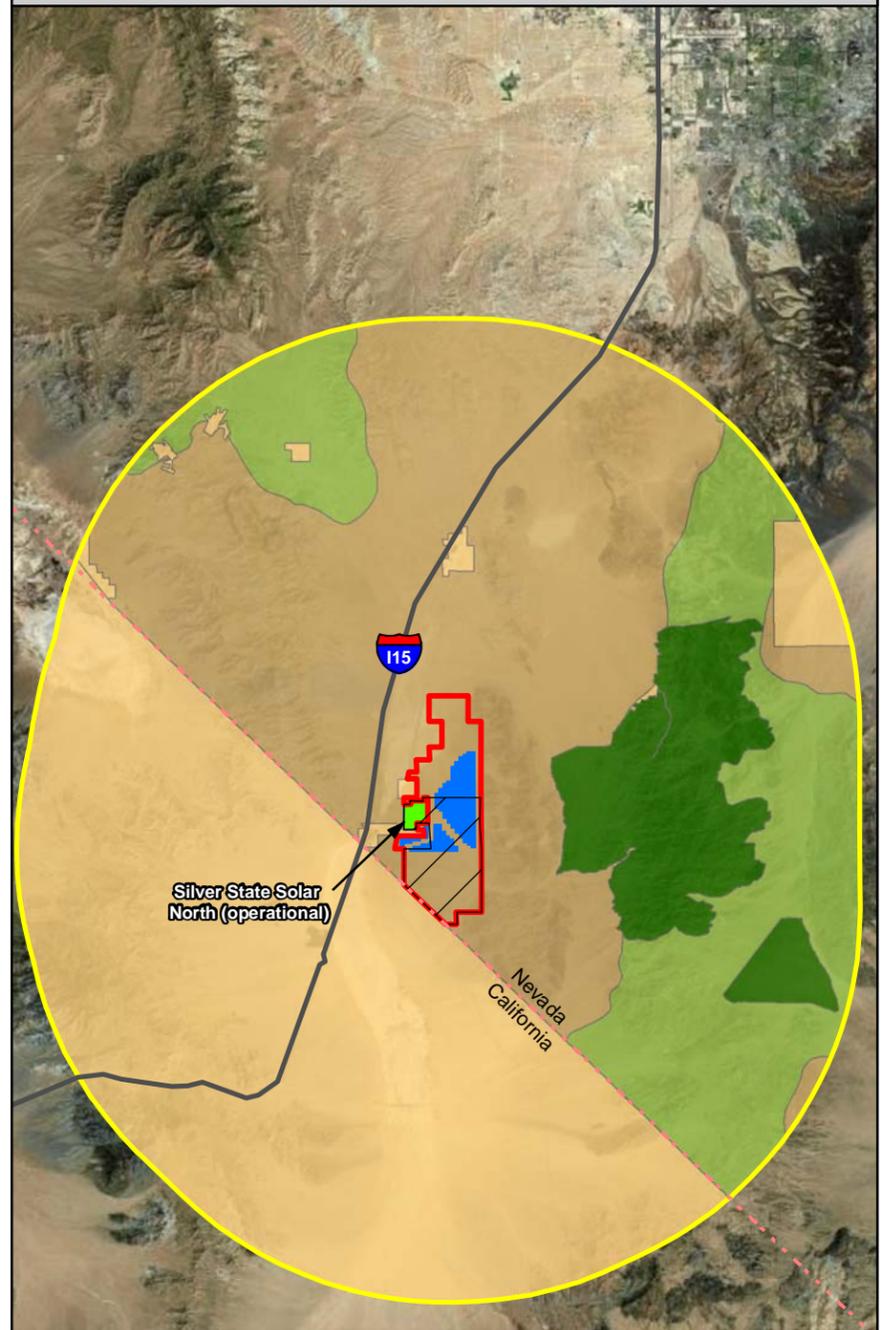
**FIGURE
3.12-5**

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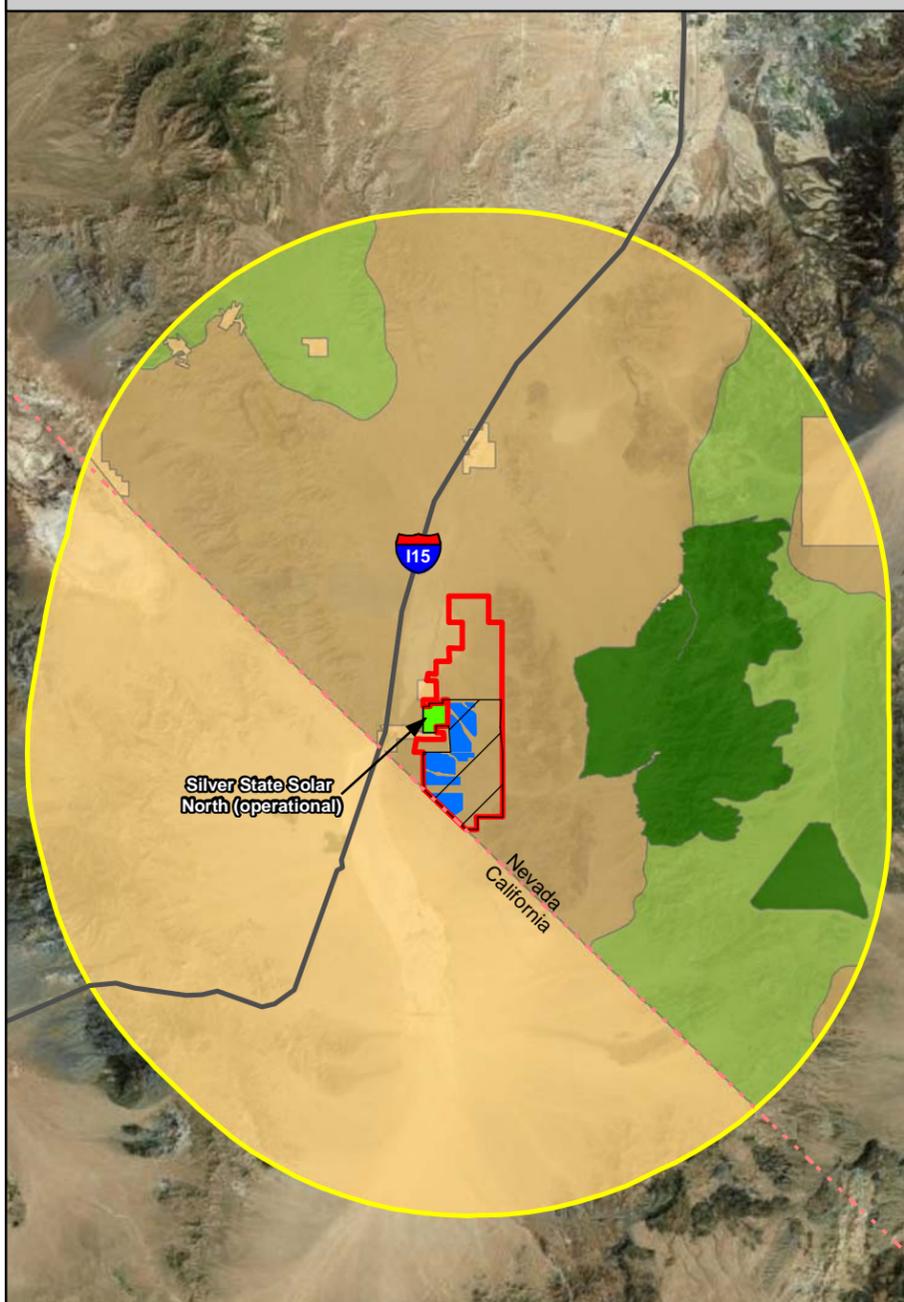
Alternative A - No Project



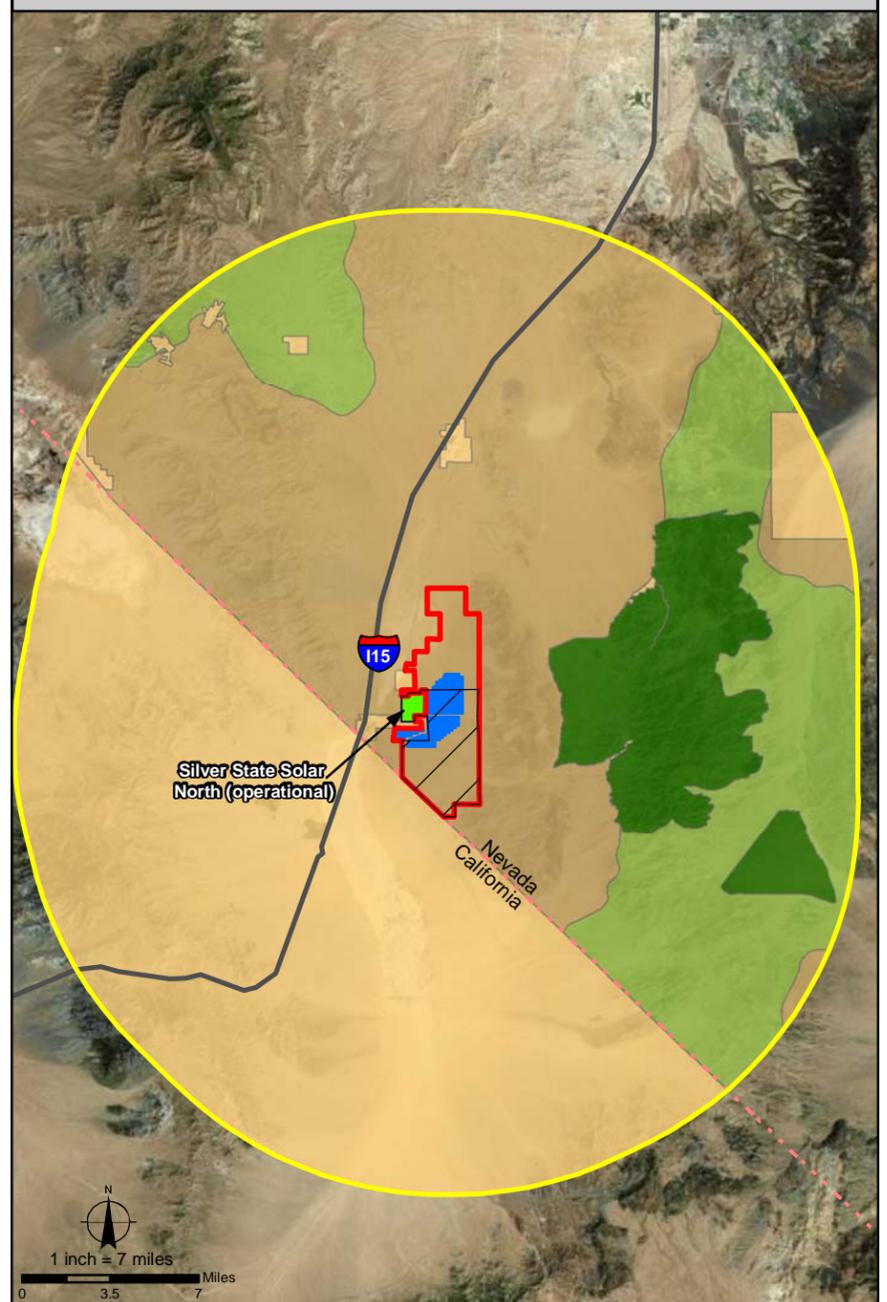
Alternative B



Alternative C



Alternative D



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**Visual Resource Management Classifications
Alternatives A, B, C & D
Silver State Solar South Project**

**FIGURE
3.12-6**

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3.14 HEALTH AND SAFETY/HAZARDOUS MATERIALS

Existing conditions relative to human health and safety/hazardous materials are described in Section 3.15 in the 2010 Final EIS. The ROI for human health and safety/hazardous materials described in the 2010 Final EIS encompassed the regional area and the project vicinity. The same ROI applies to the proposed Silver State Solar South Project analyzed in this Supplemental EIS. Hazards associated with seismic conditions are addressed in Section 3.3, flood-related hazards are addressed in Section 3.5, and hazards associated with fire are addressed in Section 3.18.

Only two potentially contaminated hazardous materials sites are located in the vicinity of the 12,958-acre ROW application area. Both sites are associated with underground storage tanks located in Primm and are federally regulated sites that are undergoing cleanup activities. Additional potential sources of hazards or hazardous materials within the ROW application area include pipelines and other utilities crossings and the Union Pacific Railroad line located along the western boundary of the ROW application area.

3.15 SOCIAL AND ECONOMIC CONDITIONS

Social and environmental conditions in the regional area and the Silver State Solar Project study area are described in Section 3.15 in the 2010 Final EIS. The ROI for socioeconomic impacts analyzed in the 2010 Final EIS are the communities, stakeholders, and resources that could be affected by construction and operation of the Silver State Solar South Project. The portion of the ROI closest to the project footprint is Primm. More broadly, the region includes the Ivanpah Valley and the South Clark County Planning area. The same ROI applies to the proposed Silver State Solar South Project analyzed in this Supplemental EIS. A detailed description of the social and economic conditions of Clark County is provided in the 2010 Final EIS, and is incorporated by reference in this Supplemental EIS. However, a summary of the 2010 Final EIS description is provided below.

The ROW application area falls within the South County Planning Area; a special planning sub-region for Clark County. The South County Planning Area includes the unincorporated communities of Jean (5 miles north of the ROW application area) and Primm (2 miles west of the ROW application area); these areas fall within census tract 57.03. The community of Goodsprings is also within this planning area and falls within census tract 58.16.

The immediate area near Primm is sparsely populated.

Affected social groups in the vicinity of the proposed Project include:

- Public Land Recreational Users/Off-Highway Vehicle Users/Organizations and
- Supporting Industries
- Environmental Groups and Stewards
- Project Construction Workers and Suppliers to the Renewable Energy Industry
- Utility Off-Taker and End-Use Energy Consumers
- Local Private Land Owners/Residents/Large Lot Owners

Additional detail on social and economic conditions of Primm is provided below.

3.15.1 Community of Primm

While it is not a census-designated place, the 2000 census population for the community of Primm is 436 (US Census Bureau 2000). An estimate from the 2010 census is not yet available for Primm. The Clark County Comprehensive Planning Department (2008) identified a population of 1,060 in 2008, apparently using different boundaries for the area.

Primm's economy is based on its three casinos, which attract gamblers from Southern California wanting to stop before reaching Las Vegas 40 miles to the north, or as a last chance to gamble before leaving Nevada. The community's hotels also serve as reliever hotels on the occasions when Las Vegas hosts major conventions. Most of Primm's residents are employees of the casinos.

Primm is also home to a large outlet mall, Fashion Outlets of Las Vegas, as well as, gas stations, restaurants, and apartments for the workers of Primm. In 2004, under MGM Mirage ownership, the Desert Oasis apartment complex was constructed with 52 apartment buildings to house employees at the three casinos, accommodating approximately 650 people. Previously, employee housing did exist, but mobile homes were used instead of apartments.

Organized and informal off-road motorized recreation also plays a role in the economy of Primm. For example, in 1996, SCORE International started hosting an annual off-road race known as Terrible's SCORE Primm 300; this race has historically attracted as many as 8,000 visitors to the area (Dieli 2011). Refer to Section 3.11 of this Supplemental EIS for details on off-road recreation in the ROI.

3.16 ENVIRONMENTAL JUSTICE

Environmental justice populations in the regional area and the Silver State Solar Project study area are described in Section 3.16 in the 2010 Final EIS. The ROI for environmental justice is the census geographies (census tracts, block groups and blocks) encompassing all potential project construction and operation areas. The same ROI applies to the Project analyzed in this Supplemental EIS, and the description of the Affected Environment presented in the 2010 Final EIS is incorporated by reference. An updated description of the ROI with 2010 Census data is provided below.

The ROI is completely within Census Tract 57.03 in Clark County. In 2010, 91.6 percent of the population in that Census Tract was over age 18, compared to 75.4 percent in Nevada as a whole. In 2010, 19.3 percent of the population in this Block Group was considered to be a minority (compared to 33.8 percent in Nevada as a whole), and 12.4 percent was considered to be Hispanic or Latino (compared to 26.5 percent in Nevada as a whole). There are no minority communities within the ROI, as there is zero population in these areas. As such, the study area is not considered an environmental justice community with respect to minority populations.

Poverty rate data for Census Tract 57.03 from the 2010 census is not yet available. In 2008, Clark County had 9.9 percent living below poverty level, and the State of Nevada had an 11.3 percent poverty rate. These are both lower than the national poverty status of 12.4 percent. As there is zero population living within the boundaries of the ROI, there are no low-income

communities in the study area; thus, the study area is not considered an environmental justice community with respect to income.

3.17 ENERGY AND MINERALS

Energy and minerals in the regional area and the Silver State Solar Project study area are described in Section 3.17 in the 2010 Final EIS. The ROI for energy and minerals described in the 2010 Final EIS included 7,387 acres of the current ROW application area, and that description is incorporated by reference in this Supplemental EIS. A summary of the Affected Environment description from the 2010 Final EIS is presented below, with updates as relevant for the additional 5,571 acres included in the current ROW application area.

Locatable mineral resources available within the 7,387 acres of ROW application area analyzed in the 2010 Final EIS were identified by compiling data from BLM's GeoCommunicator records system (BLM 2010) and the BLM's Legacy Rehost 2000 (LR2000) database (BLM 2012). Four mining claims were active in the past (D&M #7, D&M #10, James #23, and Copper Hill #9), but these were closed between 1989 and 2008 (BLM 2012). There are also four active mining claims (NMC1022853 - NMC1022856) that have been filed on land within the previously analyzed ROW application area. On August 9, 2011, an "Affidavit and Notice of Intent to Hold Mining Claims" was filed for these claims with the Clark County Recorder, and maintenance fees for 2012 were paid to BLM on August 10, 2011. The expanded ROW area associated with the proposed Project would also encompass two additional active claims to the east of Jean Dry Lake, NMC697732 and NMC695988.

A Notice of Segregation related to the proposed project was published in the Federal Register on September 1, 2011, serves to segregate the identified lands from appropriation under the public land laws, including location under the Mining Law, but not the Mineral Leasing Act or the Materials Act, subject to valid existing rights. To be valid, a mining claim must contain, within its boundaries, a "valuable mineral deposit." Thirty-eight other claims were mined in the past in the lands surrounding the ROW application area; however, all were closed by the late 1980s. There are no oil or gas producers or seeps within 5 miles of the 12,958-acre ROW application area.

The nearest active mining operation is the sand and gravel quarry in South Jean Community Pit to the north of the ROW application area (Nevada Bureau of Mines and Geology 2010). The historic mining district of Sunset lies to the southeast of the ROW application area, and historically produced small quantities of silver and gold. It is not actively mined at present.

3.18 FUELS AND FIRE MANAGEMENT

Information related to fuels and fire management in the regional area is described in Section 3.18, in the 2010 Final EIS. The ROI for fuels and fire management in the 2010 Final EIS included the Tortoise-Moderate Density Fire Management Unit (FMU) and the Goodsprings-Primm FMU. Major topographical features within the Tortoise-Moderate Density FMU include California Wash, Eldorado Mountains, Hiko Wash, Ivanpah Valley, Morman Mesa, Muddy Mountains, New York Mountains, Newberry Mountains, and the Pahrump Valley. The Goodsprings-Primm FMU is a discontinuous area that includes the rural towns of Goodsprings,

Primm, Sandy Valley, Jean, and the Jean Lake disposal area, as well as five regional public land disposal areas. The same ROI applies to the Project analyzed in this Supplemental EIS.

Primm is classified as a “Low Fire Hazard” area due to its low wildfire ignition risk potential, sparse vegetation, and sufficient defensible space. Fifteen minor fire incidents have occurred within a 5-mile radius of Primm between 1982 and 2006, ranging from 0.1 to 0.5 acres in size. While most fires have been small in this area, during the 2005 fire season over 900,000 acres burned in wildland fires in southern Nevada, including the 2005 Devil’s Peak Fire, about 10 miles northwest of Primm which burned approximately 568 acres and the 2005 Goodsprings Fire, about 16 miles northwest of Primm which burned approximately 33,569 acres. The closest resources to respond to a wildland fire threatening the community would come from Clark County Fire Department Station 78 in Goodsprings, approximately 30 miles to the north. Coordinated wildland fire response resources can be requested through the Las Vegas Interagency Communication Center, or LVICC. The BLM will respond to wildland fires on BLM lands. Wildland fire response resources are available from the BLM, US Forest Service, National Park Service, US Fish and Wildlife Service, and the Nevada Division of Forestry

Current fuel and fire management direction for the Tortoise-Moderate Density FMU and the Goodsprings-Primm FMU is given in the BLM Southern Nevada District Office’s (SNDO) Fire Management Plan for the Southern Nevada Planning Unit. Wildland fire is managed utilizing the full range of fire management activities including fire suppression, prescribed fire or other fire control measures, as deemed appropriate by the Las Vegas Resource Area and SNDO fire management. A Fuels Management Plan was prepared for Silver State North, and that plan contains measures generally applicable to reducing risk of fire ignition and spread in relation to a solar development.