

CHAPTER 4 – ENVIRONMENTAL CONSEQUENCES

Summary of changes in the Final Supplemental EIS/PRMPA:

In addition to minor grammatical changes and clarifications, changes in Chapter 4 include:

- analysis of impacts in all resource areas related to the BLM Preferred Alternative – to facilitate public review of this new Project configuration, the impact assessment for the BLM Preferred Alternative is presented as the final alternative within each resource area;
- refinements of acreages for the ROW application area and proposed ACEC;
- additional baseline information for the Project footprint related to the BLM Preferred Alternative (desert tortoise abundance and density, cacti and yucca abundance);
- updated information regarding impacts to waters of the U.S. based on USACE jurisdictional determinations;
- updated status of mining claims within the ROW application area; and
- updated cumulative impact analysis with an additional cumulative project (the Large Scale Translocation Site [LSTS]), increased discussion of the Southern Nevada Supplemental Airport (SNSA), and increased discussion of cumulative biological resource impacts.

This chapter provides a description of the effects on the environment that could occur from the No Action alternative, from the construction, operation, and ultimate decommissioning of the Project or other action alternative, and from amending the LVFO RMP. Information about the existing condition of the environment provided in Chapter 3 was used as a baseline from which to measure and identify potential impacts resulting from the Project and the potential RMP amendments.

This chapter begins with a summary of the terms and methods used for the impact assessment and general mitigation. Subsequent sections for each resource describe the impacts that could result from each alternative.

Types of Impacts to be Addressed

Impacts are defined as modifications to the existing environment brought about by implementing an alternative. Impacts can be beneficial or adverse, result from the action directly or indirectly, and can be long-term, short-term, temporary, or cumulative in nature. The analysis in this chapter provides a quantitative or qualitative comparison (dependent on available data and nature of the impact) between alternative impacts and establishes the severity of those impacts in the context of the existing environment. The discussion of each resource includes sections for specifically required disclosures under NEPA, including the disclosure of residual impacts, irreversible and irretrievable commitment of resources, and the impact of the Project's short-term resource use on

the long-term productivity of the Project area. These required disclosures are explained in the section below.

Direct impacts are attributable to implementation of an alternative that affects a specific resource, and generally occur at the same time and place.

Indirect impacts can result from one resource affecting another (e.g., soil erosion and sedimentation affecting water quality) or can occur later in time or removed in location, but can be reasonably expected to occur.

Long-term impacts are those that would remain for the life of the Project. For the analysis contained in this EIS, long-term impacts are those lasting beyond 5 years after the implementation of the alternative.

Short-term impacts result in changes to the environment that are stabilized or mitigated rapidly and without long-term effects. For the analysis contained in this EIS, short-term impacts are those occurring within the first 5 years of alternative implementation.

Cumulative impacts are those which result “from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions” (40 CFR 1508.7).

NEPA regulations, 40 CFR 1502.16, require a discussion of **irreversible or irretrievable commitments of resources** which would be involved with the Project. A resource commitment is considered irreversible when impacts from its use would limit future use options and the change cannot be reversed, reclaimed, or repaired. A resource commitment is considered irretrievable when the use or consumption of the resource is neither renewable nor recoverable for use by future generations until reclamation is successfully applied.

Mitigation and Residual Impacts

The mitigation measures identified in Chapter 4 consist of potential additional mitigation not included as APMs under any of the alternatives (including measures outside the jurisdiction of the lead or cooperating agency) that could be implemented to address impacts that would result from Project implementation. The residual impacts section addresses impacts that cannot be avoided by the application of mitigation measures. This section, therefore, discloses the effectiveness of proposed mitigation measures for each resource, and helps the decision maker identify those mitigation measures to be included in the ROD.

4.1 AIR QUALITY AND CLIMATE

The climate and existing air quality of the region and the Silver State Solar Energy Project study area are fully described in *Section 3.1 Air Quality and Climate* in the 2010 Final EIS and summarized in *Section 3.1* in this document. The cumulative effects study area (CESA) for air quality and **GHG emissions** is described in *Section 4.19* in this Supplemental EIS/PRMPA.

4.1.1 Indicators

The Proposed Action would affect air quality if it would:

- Conflict with or obstruct implementation of an applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is in non-attainment under an applicable Federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors); or
- Expose sensitive receptors to substantial pollutant concentrations.

GHG impacts from the Proposed Action would affect the environment if they would:

- Help or hinder attainment of the State's goals of reducing GHG emissions (NCCAC 2008);
- Increase the consumption of energy resources, especially fossil fuels;
- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or
- Conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of GHGs.

4.1.2 Direct and Indirect Effects by Alternatives

Construction and operation of the proposed Project would have direct and indirect impacts on air quality and GHG emissions.

4.1.2.1 Alternative A - No Action Alternative

Under Alternative A, there would be no construction or operational emissions from the proposed Project, the ROW application area would not be disturbed, and the BLM would not amend the RMP. The BLM would continue to manage land encompassing the Project area consistent with the existing RMP.

Because there would be no RMP amendment and no solar project approved for the site under this alternative, it is expected that the site would continue to remain in its existing condition with no new structures or facilities constructed or operated on the site. As a result, none of the impacts to air quality or GHG emissions from the proposed Project would occur. In the absence of this Project, other renewable energy projects may be constructed to meet State and Federal mandates and those projects may have similar impacts in other locations.

4.1.2.2 Alternative B – Applicant's Proposed Project

Construction of the proposed Project would take approximately three years to complete and would generate emissions of carbon monoxide (CO), nitrogen oxides (NO_x), volatile organic compounds (VOCs), sulfur dioxide (SO₂), particulate matter with a mean aerodynamic diameter of 10 micrometers or less (PM₁₀), and particulate matter with a mean aerodynamic diameter of

2.5 micrometers or less (PM_{2.5}). Ozone (O₃) is not emitted directly from emission sources, but is created in the atmosphere via a chemical reaction between NO_x and VOCs in the presence of sunlight; these compounds are referred to as ozone precursors. Table 4.1-1 below presents estimates of total emissions during construction, both as a yearly average as well as total emissions from all construction activities. Conservatively high emissions rates were used in calculating these values, so actual emissions can be reasonably expected to be lower than the emissions listed in Table 4.1-1.

Table 4.1-1. Construction Emissions Estimates

Year	Emissions (tons)						GHG Total Emissions (metric tons)		
	VOCs	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}	CO ₂	CH ₄	CO _{2e}
2014	3.3	23	25	0.36	82	11	4,837	0.09	4,840
2015	6.4	48	50	0.72	163	22	9,675	0.18	9,679
2016	6.4	48	50	0.72	163	22	9,675	0.18	9,679
Project Total	22	162	160	2.3	542	73	31,990	0.66	32,004

Note: Emissions were adjusted for new acreages of disturbance from emission values found in the 2010 Final EIS. Refer to Appendix A of the 2010 Final EIS for detailed summaries of Project emissions. Emissions from CY 2013 were removed since the first phase of the project described in the 2010 Final EIS (Silver State North) was completed following the ROD. Assumptions: overall equipment and vehicle usage (and associated emissions) for construction work were divided into the calendar years as follows: 20% for Year 2014; 40% for Year 2015; and 40% for Year 2016. Assumed 3,881 acres affected by Project.

Construction emissions under Alternative B would be greater than for the Alternative 2 analyzed in the 2010 Final EIS because the total area of ground disturbance would increase from 2,967 acres to 3,881 acres. Operational and decommissioning emissions would not change for the proposed Project from those analyzed in the 2010 Final EIS. The same removal activities would be conducted during decommissioning despite the difference in footprint areas. Tables showing emissions for operation and decommissioning can be found in the 2010 Final EIS in *Section 4.1 Air Quality and Climate Impacts*: Table 4.1-2 – Summary of Yearly Operational Emissions Estimates and Table 4.1-3 – Summary of Decommissioning Emissions Estimates.

Effect AQ-1: Short-term effects on air quality conditions resulting from construction and decommissioning.

Exhaust and fugitive dust emissions generated from construction equipment and vehicles would increase ambient concentrations of air pollutants. However, these emissions are not expected to contribute to regional exceedances of National Ambient Air Quality Standards (NAAQS) for criteria air pollutants for which the areas have been designated as “nonattainment”. Emissions from both construction and decommissioning would not exceed established thresholds.

The construction phase of the proposed Project would temporarily generate fugitive dust from grading and other construction activities. To comply with Clark County dust control requirements, the Applicant would use water to control dust. Currently, only water is approved for dust control within potential threatened and endangered species habitat. Areas of higher erosion or poor soils, outside of desert tortoise habitat, may require application of a palliative

dust reducing agent. Any application of palliative or other dust-reducing agent other than water must first be approved by BLM.

Disturbance of the site (e.g., grading or removal of vegetation) for the Project could have impacts through dust generation after the site is decommissioned. To ensure that decommissioning the facility would not have an adverse effect, a Facility Decommissioning Plan would be developed and approved by the BLM at least six months prior to commencement of site closure activities. The Plan would address future land use plans, impacts and mitigation associated with closure activities, the schedule of closure activities, equipment to remain on the site, and conformance of the plan with applicable regulatory requirements and resource plans. The Facility Decommissioning Plan would be consistent with requirements and goals set forth in the Site Restoration Plan. The extent of site closure activities would be determined at the time of the closure, in accordance with the Facility Decommissioning Plan. Potential closure activities could include re-grading and restoration of original site contours and re-vegetation of areas disturbed by closure activities in accordance with the Site Restoration Plan.

Effect AQ-2: Long-term adverse effects on air quality conditions resulting from operations.

Ongoing emissions associated with operation of the proposed Project would include exhaust from the emergency fire pump, mobile combustion emissions from worker commutes and delivery trips, and limited fugitive dust from inspection and maintenance vehicles traveling on unpaved roads.

Long-term, ongoing emissions associated with operation of the proposed facility would be relatively minor. There would be no large combustion sources on the site. Fugitive dust emissions would continue from O&M vehicles traveling on the gravel roads. Dust management needs from operational activities are expected to be minimal, as vehicular traffic during operations would primarily be related to periodic inspections of equipment. Dust would also be generated via the action of wind upon the disturbed soils within the Project footprint. Due to the solar panels' orientation and placement low to the ground, the panels themselves may partially shield the ground from prevailing winds. The surface soils would be less disturbed by windy conditions than if the panels were not present, but the Project-related soil disturbance would be expected to increase the amount of wind-driven dust as compared to existing conditions.

The estimated yearly emissions totals for O₃ precursors (NO_x and VOCs) associated with ongoing Project operation would be less than the de minimis thresholds as specified under the Federal General Conformity Rule (40 CFR 93); thus, Project operation-related emissions are assumed to conform to the State Implementation Plan and the regional air quality plans.

Effect AQ-3: Potential net benefits to regional air quality.

Although not quantified due to the speculative nature of emissions benefits, long-term generation of renewable electricity through solar power could have long-term air quality benefits as part of regional and national goals to replace other forms of electricity production that may generate much higher levels of air pollutants.

Effect AQ-4: Beneficial effects on GHG emissions.

The CEQ issued draft guidance on February 18th, 2010, which states that “if a Proposed Action would be reasonably anticipated to cause direct emissions of 25,000 metric tons or more of CO₂-equivalent (CO₂e) GHG emissions on an annual basis, agencies should consider this an indicator that a quantitative and qualitative assessment may be meaningful to decision makers and the public” (CEQ 2010). CEQ does not propose this as an indicator of a threshold, but rather as an indicator of a minimum level of GHG emissions that may warrant some description in the appropriate NEPA analysis for agency actions involving direct emissions of GHGs.

Long-term air quality benefits include potential avoidance of emissions associated with electric production from petroleum resources. This includes enabling reductions in the use of fossil fuels as an energy source, which would reduce GHG emissions as well as emissions of criteria air pollutants.

During construction, it is estimated that annual GHG emissions would range from approximately 3,700 to 7,400 metric tons of CO₂e emitted from construction equipment and worker commute vehicles. Although the relative scale of these emissions would be extremely small when compared to State or national GHG emissions levels, the cumulative nature of other ongoing projects in conjunction with the Proposed Action could contribute to an increase in emissions of GHGs. This impact is addressed further in the cumulative impact analysis in this document (*Section 4.19*).

Ongoing operational emissions of GHGs are estimated at approximately 134 metric tons of CO₂e per year, and would thus not adversely affect levels of GHG emissions or hinder Federal or State attempts to reduce GHG emissions levels. It is estimated that decommissioning would generate approximately 7,600 metric tons of CO₂e, and would thus not adversely affect emission levels of GHGs or hinder Federal or State attempts to reduce GHG emissions levels.

4.1.2.3 Alternative C - Alternative Layout

Compared with Alternative B, Alternative C would require less earth-moving and grading because the location within the alluvial fan would require establishment of defined drainage corridors, but not construction of detention basins or large berms. Fewer total emissions would be generated through construction of Alternative C than from those listed above for Alternative B because the total amount of area disturbed is less than the area disturbed under Alternative B. Operational and decommissioning emissions of Alternative C would be the same as for Alternative B. The same measures used to control fugitive dust under Alternative B would also be used under this alternative.

4.1.2.4 Alternative D - Modification to Proposed Action Layout

Since site preparation would be very similar under each action alternative, impacts would be the same as described under Alternative B. The impacts to air quality and GHG emissions would be similar to those of Alternative B, as the changes in duration of Project construction are expected to be relatively minor. Lower levels of fugitive emissions would be generated through construction of Alternative D than from those listed above for Alternative B as the area of

disturbance would be less. Operational and decommissioning emissions of Alternative D would be the same as for Alternative B. The same measures used to control fugitive dust under Alternative B would also be used under this alternative.

The designation of the ACEC under Alternative D would not be expected to substantially affect air quality within the 30,912-acre area under consideration. Management prescriptions that are proposed for the ACEC for development, recreation and other activities that generate emissions (refer to Table 2-2 in this document) would generally be similar or more restrictive when compared to existing management in this area.

4.1.2.5 BLM Preferred Alternative

The BLM Preferred Alternative would have very similar effects on air quality and greenhouse gas emissions as compared to Alternative B, C and D. Construction emissions under the BLM Preferred Alternative would be substantially less than for Alternative B because the size of the solar array would be reduced from 350 MW_{AC} to 250 MW_{AC}, with total area of ground disturbance decreasing from 3,881 acres to 2,427 acres. The soils that would be disturbed under the BLM Preferred Alternative would have similar tendencies to generate fugitive dust from wind or mechanical disturbance. However, because construction would require less ground disturbance and would likely occur over a shorter duration, short-term effects of pollutant emissions would be reduced. Operational and decommissioning emissions would be similar to those described for Alternative B, but would again be somewhat less because of the reduced scale of the alternative.

Removal of the Project footprint from the SRMA would mean that OHV activity in that 2,427-acre area would not occur, aside from transit through the site via the designated access route. That restriction on OHV access would not be expected to substantially reduce emissions from vehicles as those OHV users would likely recreate elsewhere in the vicinity rather than completely cease the activity. Impacts related to designation of the 31,859-acre ACEC would be as described for Alternative D.

4.1.3 Mitigation Measures

The same APMs described in the 2010 Final EIS, **APM-3**, would be implemented for the proposed Project. A detailed description of APMs can be found in this document in *Section 2.7 Applicant-Proposed Measures and Mitigation Measures*, Table 2-3. Any additional mitigation will be in accordance with the Project's dust control permit and Clark County regulations and BMPs.

APM-3: Air/Dust Control.

4.1.4 Residual Effects

Residual effects for the proposed Project are consistent with residual effects for the Silver State Solar Energy Project analyzed in the 2010 Final EIS. Construction and decommissioning of the proposed Project are anticipated to have temporary impacts that will be mitigated below

significance using **APM-3**. Operations and maintenance would produce long-term beneficial effects that would result from the proposed Project's new source or renewable energy; therefore, the residual impact on air quality would be beneficial.

4.2 NOISE

The ambient noise and vibrations in the regional area and the Silver State Solar Project study area are fully described in *Section 3.2 Noise* in the 2010 Final EIS and summarized in *Section 3.2* in this document. The CESA for noise is described in *Section 4.19 Cumulative Impacts* in this document. Noise generated by the proposed Project would consist of temporary construction noise and long-term operational noise.

4.2.1 Indicators

The Proposed Action would affect ambient noise and vibration levels if it would:

- Result in the generation of noise levels or exposure of persons and sensitive species to noise levels in excess of standards established in applicable Federal, State, and local general plans or noise ordinances at nearby noise-sensitive areas; or
- Result in generation of, or exposure of persons to, groundborne vibration or groundborne noise levels in excess of 75 vibration decibels (VdB) (generally considered intrusive for residential uses) unless allowed by Federal, State, or local codes or ordinances.

4.2.2 Direct and Indirect Effects by Alternatives

All effects discussed in this section are direct. No indirect effects were identified for this resource.

4.2.2.1 Alternative A - No Action Alternative

Under Alternative A, there would be no construction or operational activities from the proposed Project, the ROW application area would not be disturbed, and the BLM would not amend the RMP. The BLM would continue to manage land encompassing the Project area consistent with the existing RMP.

Because there would be no RMP amendment and no solar project approved for the site under this alternative, it is expected that the site would continue to remain in its existing condition with no new structures or facilities constructed or operated on the site. As a result, none of the impacts to noise from the proposed Project would occur. In the absence of this Project, other renewable energy projects may be constructed to meet State and Federal mandates and those projects would have similar impacts in other locations.

4.2.2.2 Alternative B – Applicant’s Proposed Project

Clark County does not have regulations quantitatively limiting noise generation or effects from the Proposed Action during the construction phase. Clark County has regulations regarding noise generation from operations, as discussed in the 2010 Final EIS *Section 4.1.2.2, Noise-Local*.

Effect NOI-1: Short-term, increase in ambient noise and vibration levels as a result of construction activities.

The construction phase of the proposed Project is expected to last 36 months, spanning a period from the fourth quarter of 2013 to the fourth quarter of 2016. During peak construction activity, 230 to 400 workers would be needed. Across the entire construction phase, the average workforce is expected to number approximately 230 workers.

Equipment Noise: Table 4.2-1 in the 2010 Final EIS shows noise levels of construction equipment that would be used for the proposed Project. Noise levels at various distances for equipment that will be used for the construction of the proposed Project can be found in Table 4.2-2 in the 2010 Final EIS. Based on these noise levels and the distance to sensitive receptors, noise from construction equipment would not be audible to any sensitive receptors, including residences in Primm. A full discussion of equipment noise and sensitive receptors can be found in the 2010 Final EIS. Implementation of **MM NOI-1** through **MM NOI-6** would further reduce noise impacts during the construction phases (*Section 2.7 Applicant-Proposed Measures and Mitigation Measures* Table 2-4 in this document).

Transmission Lines, Corona Noise and Substations: Corona noise is a low-level buzz generated from high voltage power lines and would only be audible in the immediate vicinity of the transmission lines when other noise sources are not present. None of the proposed transmission lines associated with the proposed Project would pass near inhabited areas, and corona noise would thus not be audible to sensitive receptors. Construction noise would be mainly from construction equipment and would not be discernible above background noise. The South substation is approximately 3 miles northeast of Primm with no sensitive receptors nearby.

Effect NOI-2: Long-term increase in ambient noise levels as a result of operational noise.

Long-term increases in ambient noise would be incremental and negligible, and would be generated by employee commuting, panel washing (twice per year), maintenance vehicles, and operational noise from electrical equipment. A full discussion can be found in *Section 4.2 Noise* in the 2010 Final EIS.

Operation and maintenance activities associated with the transmission line, substations, transformers and the solar arrays would typically result in noise levels below those associated with construction-related activities, and are anticipated to involve fewer pieces of heavy equipment, occur less frequently, and be of shorter duration than construction activities. Operational noise will be generated from electrical equipment (corona noise) and maintenance activities are primarily inspection-related (for example, annual inspection of the transmission line from vehicles). Implementation of **MM NOI-7** would further reduce noise impacts during the operation and maintenance phase of the proposed Project (*Section 2.7 Applicant-Proposed Measures and Mitigation Measures*, Table 2-4 in this document).

4.2.2.3 Alternative C - Alternative Layout

Alternative C would be constructed and operated similar to Alternative B. The footprint of Alternative C is shifted south and broken up by drainage berms in comparison to Alternative B, but construction techniques would be largely the same. Development activities would remain no closer than one mile from any potential sensitive receptors such as the residential uses in Primm. The same mitigation measures from Alternative B would be implemented for Alternative C.

4.2.2.4 Alternative D - Modification to Proposed Action Layout

Alternative D would be constructed and operated similar to Alternative B (the Proposed Action). The footprint is shifted west and consolidated into more contiguous blocks of development as compared to the Alternative B. Development activities would remain no closer than one mile from any potential sensitive receptors such as the residential uses in Primm. The same mitigation measures from Alternative B would be implemented for Alternative D.

The designation of the ACEC under Alternative D would not be expected to substantially affect noise within the 30,912-acre area under consideration. Management prescriptions proposed for the ACEC for development, recreation and other activities that generate noise and vibration (refer to Table 2-2 in this document) would generally be similar or more restrictive when compared to existing management in this area. Therefore, the ACEC designation would have either no impacts or beneficial impacts to noise.

4.2.2.5 BLM Preferred Alternative

Noise from the construction of the BLM Preferred Alternative would be would be substantially less than for Alternative B because the size of the solar array would be reduced from 350 MW_{AC} to 250 MW_{AC}, with total area of ground disturbance decreasing from 3,881 acres to 2,427 acres. The footprint of the BLM Preferred Alternative is shifted west in comparison to Alternative B, but construction techniques would be largely the same. Development activities under the BLM Preferred Alternative would remain no closer than one mile from any potential sensitive receptors such as the residential uses in Primm. Because construction would require less ground disturbance and would likely occur over a shorter duration, short-term noise effects would be reduced. Noise from operation and decommissioning would be similar to those described for Alternative B, but would again be somewhat less because of the reduced scale of the alternative. The same noise mitigation measures from Alternative B would be implemented for the BLM Preferred Alternative. Impacts related to designation of the 31,859-acre ACEC would be as described for Alternative D.

4.2.3 Mitigation Measures

Mitigation measures applicable to the proposed Project are the same as those described in the Silver State Solar Energy Project analyzed in the 2010 Final EIS. A detailed description of mitigation measures can be found in *Section 2.7 Applicant-Proposed Measures and Mitigation Measures*, Table 2-3 and Table 2-4 in this document.

MM NOI-1: Conduct Construction Activities during Daytime Hours.

MM NOI-2: Turn off Idling Equipment.

MM NOI-3: Notify Adjacent Residences.

MM NOI-4: Install Acoustic Barriers.

MM NOI-5: Proper Maintenance and Working Order of Equipment and Vehicles.

MM NOI-6: Construction Equipment Muffled.

MM NOI-7: Ensure Proper Installation of Transformer Equipment.

4.2.4 Residual Effects

Construction and decommissioning of the proposed Project are anticipated to have temporary impacts that will end as soon as the construction and decommissioning processes are complete. Operations and maintenance would produce low levels of long-term noise that would not be audible from nearby receptors; therefore, there are no residual impacts anticipated.

4.3 GEOLOGY, TOPOGRAPHY, AND GEOLOGIC HAZARDS

The geology, topography and geologic hazards of the regional area and the Silver State Solar Project study area are fully described in *Section 3.3 Geology, Topography, and Geologic Hazards* in the 2010 Final EIS and summarized in *Section 3.3* in this document. The CESA for geology, topography, and geologic hazards is described in *Section 4.19 Cumulative Impacts* in this document.

4.3.1 Indicators

The Proposed Action would affect geologic resources or be affected by geologic hazards if it would:

- Be located on a geologic unit that is unstable or would become unstable as a result of the Proposed Action and result in on- or off-site landslides, lateral spreading, subsidence, liquefaction, or collapse;
- Result in physical alteration of or damage to geologic features; or
- Present a significant threat to public safety due to damage to Project components by geologic hazards.

4.3.2 Direct and Indirect Effects by Alternatives

All effects discussed in this section are direct. No indirect effects were identified for this resource. There will be no effects to geology or topography from the proposed Project, no increase in the geologic instability of the area, and no increase in the risk of on- or off-site landslides, lateral spreading, subsidence, liquefaction, or collapse. There are no unique geologic

features at the site and all proposed Project structures would have to comply with applicable earthquake building codes.

4.3.2.1 Alternative A - No Action Alternative

Under Alternative A, there would be no construction or operational activities from the proposed Project, the ROW application area would not be disturbed, and the BLM would not amend the RMP. The BLM would continue to manage land encompassing the Project area consistent with the existing RMP.

Because there would be no RMP amendment and no solar project approved for the site under this alternative, it is expected that the site would continue to remain in its existing condition with no new structures or facilities constructed or operated on the site. As a result, none of the impacts to geology, topography, and geologic hazards from the proposed Project would occur. In the absence of this Project, other renewable energy projects may be constructed to meet State and Federal mandates and those projects would have similar impacts in other locations.

4.3.2.2 Alternative B – Applicant’s Proposed Project

Effect GEO-1: Geologic units would become unstable and would result in on- or off-site landslides, lateral spreading, subsidence, liquefaction or collapse.

Although the site is located on an alluvial fan where sediments have the potential for movement during large precipitation events, the proposed Project would be constructed to minimize that potential movement by creating dikes, channels and detention basins to properly channel on-site drainage and capture much of the volume from a storm event. Void spaces would not be created and all excavations associated with the proposed Project would be filled with soil or foundation material. Therefore, it is not likely that the geologic unit would become unstable as a result of the proposed Project.

Effect GEO-2: Physical alteration of or damage to geological features.

To provide water for construction and operation of the proposed Project, two on-site wells would be drilled to a depth of approximately 600 feet using a truck-mounted drilling rig (see *Section 2.6.2 Construction Tasks* in the 2010 Final EIS for a discussion of drilling techniques). Any effects on subsurface geologic features resulting from drilling would be localized to the drilling sites. No unique geologic features were identified at the site; therefore, no effect on a unique geologic feature would occur.

Effect GEO-3: Project components damaged by geologic hazards pose a threat to public safety.

A description of the earthquake hazard for the Project area can be found in *Section 4.3 Geology, Topography, and Geologic Hazards Impacts* and *Section 3.3.3 Seismicity* in the 2010 Final EIS. All buildings would be built in compliance with earthquake building codes so damage to structural components of the proposed Project would be minimal and confined to the site. The site would be fenced and in a remote area so members of the public would not be exposed to potential earthquake damage at the facility; however, workers and wildlife could be exposed to earthquake damage at the facility. Mitigation measure **MM GEO-1** and **MM GEO-2** (*Section*

2.7 Applicant-Proposed Measures and Mitigation Measures, Table 2-4 in this document) would reduce and address any damage from a geologic hazard, such that impacts would be short-term and localized.

4.3.2.3 Alternative C - Alternative Layout

Impacts from Alternative C would be similar to those from Alternative B. The location of the site is altered slightly from Alternative B, but still within the alluvial fan described for Alternative B. Alternative C also makes an increased use of natural drainages. No construction or operational activity would alter the character of the underlying alluvial fan to make it less stable. The same mitigation measures, **MM GEO-1** and **MM GEO-2** would be implemented for Alternative C (Section 2.7 Applicant-Proposed Measures and Mitigation Measures, Table 2-4 in this document).

4.3.2.4 Alternative D - Modification to Proposed Action Layout

Impacts from Alternative D would be similar to those from Alternative B. The location of the site is altered slightly from Alternative B, but still within the alluvial fan described for Alternative B. Alternative D is more engineered than Alternative B and C reducing the chances that a large precipitation event or heavy run-off would affect the alluvial fan geology and lead to a mass movement. No construction or operational activity would alter the character of the underlying alluvial fan to make it less stable. The same mitigation measures, **MM GEO-1** and **MM GEO-2** would be implemented for Alternative D (Section 2.7 Applicant-Proposed Measures and Mitigation Measures, Table 2-4 in this document).

The designation of the ACEC under Alternative D would not substantially affect geology, topography or geological hazards within the 30,912-acre area under consideration. Management prescriptions proposed for the ACEC for development, recreation and other activities that would potentially impact these resources (refer to Table 2-2 in this document) would generally be similar or more restrictive when compared to existing management in this area. Therefore, the ACEC designation and related management prescriptions would have either no impacts or beneficial impacts to geology, topography or geological hazards.

4.3.2.5 BLM Preferred Alternative

Impacts from the BLM Preferred Alternative to geology, topography and geologic hazards would be similar to those from Alternative B, C or D, but would be reduced due to the smaller footprint of 2,427 acres. The location of the site is shifted west as compared to Alternative B, but would still be within the alluvial fan described for Alternative B. The BLM Preferred Alternative would make increased use of natural drainages as compared to the other Project alternatives. No construction or operational activity would alter the character of the underlying alluvial fan to make it less stable. The same mitigation measures, **MM GEO-1** and **MM GEO-2** would be implemented for the BLM Preferred Alternative (Section 2.7 Applicant-Proposed Measures and Mitigation Measures, Table 2-4 in this document). Impacts related to designation of the 31,859-acre ACEC would be as described for Alternative D.

4.3.3 Mitigation Measures

Mitigation measures applicable to the proposed Project are the same as those described in the 2010 Final EIS. A detailed description of mitigation measures can be found in this document in *Section 2.7 Applicant-Proposed Measures and Mitigation Measures*, Tables 2-3 and Table 2-4.

MM GEO-1: Inspections After Geologic Events.

MM GEO-2: Applicant's Insurance Coverage.

4.3.4 Residual Effects

Given that there would be no direct or indirect impacts to geology, topography, or geologic hazards, there would be no residual impacts from the proposed Project. Under all alternatives it is highly unlikely that the geologic unit would become unstable as a result of the proposed Project.

4.4 SOIL RESOURCES

The soil resources of the regional area and the Silver State Solar Project study area are fully described in *Section 3.4 Soils* in the 2010 Final EIS and summarized in *Section 3.4* in this document. The CESA for geology, topography, and geologic hazards is described in *Section 4.19 Cumulative Impacts* in this document.

4.4.1 Indicators

The Proposed Action would affect soil resources if it would:

- Increase erosion rates;
- Reduce soil productivity by compaction or soil mixing to a level that would prevent successful rehabilitation and eventual reestablishment of vegetative cover *and cryptobiotic soils* to the recommended or preconstruction composition and density; or
- Increase exposure of human or ecological receptors to potentially hazardous levels of chemicals or explosives due to the disturbance of contaminated soils or to the discharge or disposal of hazardous materials into soils.

4.4.2 Direct and Indirect Effects by Alternatives

All effects discussed in this section are direct. No indirect effects were identified for this resource area.

4.4.2.1 Alternative A - No Action Alternative

Under Alternative A, there would be no construction or operational activities from the proposed Project, the ROW application area would not be disturbed, and the BLM would not amend the

RMP. The BLM would continue to manage land encompassing the Project area consistent with the existing RMP.

Because there would be no RMP amendment and no solar project approved for the site under this alternative, it is expected that the site would continue to remain in its existing condition with no new structures or facilities constructed or operated on the site. As a result, none of the impacts to soil resources from the proposed Project would occur. In the absence of this Project, other renewable energy projects may be constructed to meet State and Federal mandates and those projects would have similar impacts in other locations.

4.4.2.2 Alternative B – Applicant’s Proposed Project

The implementation of Alternative B could result in several effects on soils. Effects are detailed below.

Effect SOIL-1: Increase in soil erosion rates.

Construction of Alternative B would occur on 3,881 acres over three years (proposed 2013 to 2016). Land would be disturbed through clearing and grading, as well as construction of impermeable surfaces in several locations within the Project site. Soils within the proposed Project area have the same Wind Erodibility classification of 8 (“erosion not a problem”) as described in the 2010 Final EIS.

Removal of the vegetation and soil crusts during construction would expose soil and increase the potential for wind- and water-driven erosion. The proposed Project site is relatively flat, but the area has the potential for high winds and infrequent strong rains which could lead to increased erosion. The use of vehicles and equipment on these disturbed areas would further increase the potential for both wind- and water-driven erosion. To reduce the potential for water-driven erosion, erosion control and storm water flow systems have been designed with storm water flow corridors reinforced with dikes and storm water detention basins located to the east and south of the solar arrays. As part of this system, the proposed Project site would be drained through the dike-reinforced natural drainage channel or collected in the detention basins (Figure 2-4). The remaining storm water flow would pass through the site naturally.

Construction of the erosion control system would reduce water erosion susceptibility of the proposed Project site and down gradient parcels. Incorporation of BMPs would further minimize soil erosion (*Section 2.7 Applicant-Proposed Measures and Mitigation Measures*, Table 2-3 and Table 2-4 in this document); however, localized loss of topsoil from wind- and water-driven erosion would still be expected.

Effect SOIL-2: Reduce soil productivity.

The soft alluvial soils that compose the proposed Project site provide habitat to desert vegetation. These soils would be lost when the proposed Project site is cleared and graded. The remaining lower quality soil would be less productive and support fewer organisms. Impacts to local flora are discussed in the *Section 4.7, Biological Resources* in this document.

Effect SOIL-3: Increase exposure of contaminated soils.

The proposed Project site is not documented as containing any contaminated or hazardous soils (NDEP 2012, USEPA 2012). Soil imported for construction purposes would be subject to mitigation measure **MM SOILS-1 and SOILS-2** (Section 2.7 Applicant-Proposed Measures and Mitigation Measures, Table 2-4 in this document).

Effect SOILS-4: Effects on biological soil crusts.

The 2010 Final EIS for the Silver State Solar Energy Project did not identify an impact to biological soil crusts from the proposed development. However, site inspections conducted during preparation of the Supplemental EIS/PRMPA indicate that these soil crusts are present throughout the ROW application area and proposed Project footprint, and would be disturbed by grading and construction activity.

Any adverse effects on biological soil crusts could adversely impact the desert ecosystem, as this soil type increases overall soil stability, fixes atmospheric nitrogen, increases water availability (for plant use), and aids seeding and germination of desert plants. Preliminary studies also suggest that the algae and lichens found in biological soil crusts, along with the vegetation that they help support, are sequestering as much CO_{2e} as temperate forests (Wohlfahrt *et al.* 2008).

Based on informal site visits taken during preparation of this Supplemental EIS/PRMPA, biological soil crusts are present within the proposed Project area. Construction of Alternative B would therefore disturb and remove as much as 3,881 acres of biological crusts through site preparation, grading, and construction. These activities would result in a total loss of the organisms within the soil crusts and ecosystem functions provided by biological soil crusts. MM SOILS-3 would ensure that a study is funded to evaluate effective mitigation strategies for cryptobiotic soils that could be used to reduce impacts from this and other future projects that involve disturbance of desert soils.

4.4.2.3 Alternative C - Alternative Layout

The Project footprint for Alternative C is located in a more southern orientation within the ROW application area, and would be built entirely within the ROW application area previously analyzed in the 2010 Final EIS. Alternative C would produce similar effects on soils as described for Alternative B. The flood control system for this alternative would drain the Project site by sheet flow to on- and off-site drainages. The drainage plan would include the use of constructed berms and existing natural washes within the footprint of the solar array (Figure 2-5). The same mitigation measures and BMPs described for Alternative B related to soil erosion, productivity and contamination would be implemented for Alternative C.

4.4.2.4 Alternative D - Modification to Proposed Action Layout

Alternative D would have impacts on soil resources similar to those in Alternative B. Alternative D would use drainage channels along the east and south borders of the Project site to divert runoff around the solar arrays (Figure 2-6 in this document). Detention basins are also included in the storm water flow system to reduce the amount of runoff impacting the site. Diverting

storm water flow around the solar array would have a similar effect on reducing water-driven erosion as the drainage system described for Alternative B. The same mitigation measures and BMPs described for Alternative B related to soil erosion, productivity and contamination would be implemented for Alternative D.

The designation of the ACEC under Alternative D would not substantially affect soil resources within the 30,912-acre area under consideration. Management prescriptions proposed for the ACEC for development, recreation and other activities that would potentially impact these resources (refer to Table 2-2 in this document) would generally be similar or more restrictive when compared to existing management in this area. Therefore, the ACEC designation and related management prescriptions would have either no impacts or beneficial impacts to soil resources.

4.4.2.5 BLM Preferred Alternative

The BLM Preferred Alternative would produce similar effects on soils as described for Alternative B, C, and D, but the area of effect would be smaller due to the reduced Project footprint of 2,427 acres. Similar to Alternative C, the flood control system for this alternative would drain the Project site by sheet flow to on- and off-site drainages. The drainage plan would include the use of constructed berms and existing natural washes within the footprint of the solar array (Figure 2-1). The same mitigation measures and BMPs described for Alternative B related to soil erosion, productivity and contamination would be implemented for the BLM Preferred Alternative. Impacts related to designation of the 31,859-acre ACEC would be as described for Alternative D.

4.4.3 Mitigation Measures

Mitigation measures applicable to the proposed Project include the two measures described in the 2010 Final EIS, and a new measure to fund study of effective mitigation for cryptobiotic soils impacts. A detailed description of mitigation measures can be found in this document in *Section 2.7 Applicant-Proposed Measures and Mitigation Measures*, Table 2-4.

MM SOILS-1: *Ensure Soils are Free from Contaminants.*

MM SOILS-2: *Ensure Soils are of the Same Soils Type.*

MM SOILS-3: *Cryptobiotic Soil Mitigation Study Funding*

4.4.4 Residual Effects

Under all action alternatives, construction, operation, and decommissioning of the proposed Project would increase the potential for localized flooding and downgradient soil loss through wind- and water-driven erosion. Although the Applicant has designed an extensive water erosion control system and committed to a series of BMPs, localized soil erosion can be expected. These residual impacts would be most prevalent on dry, windy days, when wind-driven erosion underneath the panels would be greatest, and during flash flood events larger than the 100-year flood, when water volume may exceed the capacity of the flood control system. Loss of

biological soil crusts would have a residual effect of decreased soil stability, nitrogen fixing, and water availability. Recovery of these crusts can take from 50 to 250 years (Belnap 1993).

4.5 WATER RESOURCES/HYDROLOGY

Water resources in the regional area and the previously analyzed ROW application area are fully described in *Section 3.5 Water Resources/Hydrology* in the 2010 Final EIS and summarized in *Section 3.5* in this document. The water resources and hydrologic features related to the current ROW application area are also described in *Section 3.5* in this Supplemental EIS/PRMPA. The CESA for water resources is described in *Section 4.19 Cumulative Impacts* in this document.

4.5.1 Indicators

The Proposed Action would affect water/hydrology resources if it would:

- Decrease groundwater supply or interfere substantially with groundwater recharge;
- Degrade the quality of groundwater such that it is no longer suitable for its intended use;
- Degrade the quality of surface water by increasing erosion, increasing sedimentation, or introducing contaminated waters; or
- Increase the potential for flood hazards.

4.5.2 Direct and Indirect Effects by Alternatives

Effects to water resources would occur through groundwater drawdown; however, this would only be a concern through peak water usage for dust suppression during construction. Water would be supplied by on-site wells under a long-term contract from the LVVWD. Consumption of groundwater for the proposed Project would be more than offset by treatment and infiltration of wastewater under the existing agreement with LVVWD.

The proposed Project includes changes in the ROW application area, which now encompasses additional hydrologic features that were not analyzed in the 2010 Final EIS. Further, Alternative B, D, and the BLM Preferred Alternative are designed such that drainage through the site does not cross State lines and the Project area does not contain waters of the US. The USACE issued a determination that a Section 404 Permit was required for construction of the Silver State Solar Energy Project as analyzed in the 2010 Final EIS. Consultation with the USACE was conducted for the proposed Project and it was determined that the layout for Alternatives B, D, or the BLM Preferred Alternative would have no effect to waters of the U.S. so a Section 404 Permit would not be required.

4.5.2.1 Alternative A - No Action Alternative

Under Alternative A, there would be no construction or operational activities from the proposed Project, the ROW application area would not be disturbed, and the BLM would not amend the RMP. The BLM would continue to manage land encompassing the Project area consistent with the existing RMP.

Because there would be no RMP amendment and no solar project approved for the site under this alternative, it is expected that the site would continue to remain in its existing condition with no new structures or facilities constructed or operated on the site. As a result, none of the impacts to water resources or hydrology from the proposed Project would occur. In the absence of this Project, other renewable energy projects may be constructed to meet State and Federal mandates and those projects would have similar impacts in other locations.

4.5.2.2 Alternative B – Applicant’s Proposed Project

Effect WATER-1: Construction or operation of the proposed Project would decrease groundwater supply or interfere substantially with groundwater recharge.

Impacts to water resources from construction and operation of the proposed Project are summarized in this section. An expanded discussion of water needs and storage of the proposed Project, and the contract regulating use and re-charge conditions, can be found in *Section 2.6 Proposed Project Construction* in the 2010 Final EIS. A discussion of groundwater rights, use and discharge, and quality can be found in *Section 3.5 Water Resources/Hydrology* in the 2010 Final EIS.

The potential impacts of the Silver State Solar Energy Project’s proposed water withdrawal on area wells were evaluated for the 2010 Final EIS in the First Solar Silver State Groundwater Availability Study (Appendix E in the 2010 Final EIS). The study used the USGS computer model WTAQ to simulate drawdown conditions for an 8-inch-casing diameter well for two alternative well designs, a 600-foot deep well and an 800-foot deep well, which represent the estimated range in well depths and screen lengths that would be necessary to meet the demands of the Project. The analysis modeled a predicted 200 AFY demand for the Project’s four-year construction period, followed by 20 AFY for Project operations. After the four years of construction pumping, the predicted drawdown in the 600-foot-deep well is approximately 106 feet; the drawdown in the 800-foot-deep well is about 43 feet. For both well depths, the model predicted a 0.01-foot drawdown 3 miles from the wells following Project construction. After 50 years of construction and operations of the Project, the estimated drawdown is 11 feet for the 600-foot well and 4.6 feet for the 800-foot well; the drawdown at 3 miles from each well is still less than a foot. *The Applicant has prepared an updated study of drawdown conditions for the Supplemental EIS/PRMPA, with findings of effects from groundwater pumping on wells in the vicinity of the Project under three different pumping scenarios: 800 AF (anticipated), 1,000 AF (potential need) and 1,185 AF (worst-case) (Appendix H). The impacts associated with each scenario do not result in significant impacts on neighboring wells or result in a significant increase in impacts to those wells in comparison to the analysis identified in the Draft Supplemental EIS/PRMPA. For instance, even under a “worst case” scenario of pumping 1,185 acre-feet of groundwater – which is beyond anticipated construction water use over 30 years – the Project would have a maximum drawdown of 1.8 feet at nearby wells surrounding the NV Energy Walter J. Higgins Generating Facility. Following construction, water levels in those nearby wells would stabilize at a drawdown of less than one foot during the 30-year operational period under either Project pumping scenario (First Solar 2013). In the original 2010 modeling, which assumed 800 AF of construction groundwater pumping, the drawdown was less than two feet in the neighboring NV Energy Walter J. Higgins Generating Facility wells after four years of construction and less than half a foot after the modeled 50-year operational period of the*

Project. Operational water use would remain as projected in the 2010 analysis, which was incorporated in the updated model.

If the LVVWD determines that the proposed Project is compromising its ability to provide service for its customers, the Applicant has agreed to participate in a groundwater re-charge program where the aquifer would be recharged at a rate of 270 AFY for the continued life of the Project. More details regarding the recharge can be found in the 2010 Final EIS in *Section 2.6 Proposed Project Construction*. Based on the drawdown study and the recharge agreement, the proposed Project is not expected to have a substantial impact on groundwater supply or groundwater recharge.

Effect WATER-2: Construction and operation of the proposed Project would degrade the quality of groundwater in such a way that it is no longer suitable for its intended use.

Spills of chemicals and petroleum products that could contaminate groundwater are possible during construction, operation and decommissioning of the proposed Project. *Section 4.5 Water Resources/Hydrology Impacts* and *Section 3.14 Human Health and Safety/Hazardous Materials* in the 2010 Final EIS detail where and what kind of spills could occur.

An emergency response plan would be developed to address emergencies including leaks and spills during construction. A Spill Prevention, Control and Countermeasure (SPCC) Plan would be developed and observed to protect the environment from petroleum product spills during operation. Successful implementation of the emergency response and SPCC plans would minimize the potential for a spill and detail the measures to cleanup any spills that occur. Additionally, the depth of groundwater, at more than 100 feet below the ground surface, provides added protection from contamination caused by infiltration of a surface spill.

Other sources of liquid waste with the potential for contamination would come from sanitary waste and flushing and cleaning of pipes. Construction-phase sanitary waste would be removed by a contracted sanitary service. A septic tank and drain field system would be constructed near the O&M building to accommodate operation phase sanitary waste. The septic system would be constructed and maintained in accordance with Southern Nevada Health District's Small Commercial Septic System Permit. Adherence to this permit would prevent impacts to groundwater quality from the septic system. Mitigation measure **MM WATER-1** would be implemented to reduce impacts (*Section 2.7 Applicant-Proposed Measures and Mitigation Measures*, Table 2-4).

Effect WATER-3: Degrade the quality of surface waters by increasing erosion, increasing sedimentation, or introducing contaminated waters.

Increased erosion and sedimentation, as well as spills of chemicals and petroleum products could contaminate surface water during construction, operation and decommissioning of the proposed Project. *Section 4.5 Water Resources/Hydrology Impacts* and *Section 3.14 Human Health and Safety/Hazardous Materials* in the 2010 Final EIS detail where and what kind of spills could occur. *Section 3.5.1 Surface Water Resources* describes existing surface water resources.

Successful implementation of the emergency response and SPCC plans would minimize the potential for a spill and detail the measures to cleanup any spills that occur. Erosion and sediment control would be addressed using measures found in *Section 2.6.7 Other*

Considerations for Construction of the Proposed Project in the 2010 Final EIS. These measures are consistent with regional BMPs and Federal, State, and local regulations including the Project's General Permit and Storm Water Pollution Prevention Plan (SWPPP). These measures would control erosion and sediment transport. The design of the proposed Project would also take erosion and sediment transport into consideration and be engineered to minimize impacts. Mitigation measure **MM WATER-2** would address uncertainty in the model by implementing an adaptive management plan (*Section 2.7 Applicant-Proposed Measures and Mitigation Measures*, Table 2-4 in this document).

Erosion would be increased through the removal of vegetation and installation of panels, and may result in long-term changes to runoff patterns. To reduce this impact, all vegetation removed from the site would be mulched, tilled under, or composted to remain on the Project site to assist in erosion control. Installing panels would result in precipitation flowing off and concentrating at the lower ends of the panels, creating localized gullies that would alter surface water flow. This would potentially result in increased erosion throughout the solar array panel field and the potential for increased sedimentation both on- and off-site. There are no perennial water bodies within the proposed Project site, but there are drainages (dry washes and sheet floods) in the proposed Project site area that are characteristic of alluvial fans where surface water flows during and after heavy rains. Water from these drainages flows into Roach and Ivanpah Dry Lakes, which have water on a seasonal basis and no external drainage. While no surface water quality data are available for these temporary water bodies, it is expected that bed loads and suspended loads are quite high during significant storm events. The added sedimentation from the proposed Project is not anticipated to have a substantial impact on the water bodies.

Effect WATER-4: Increase the potential for flooding hazards.

The impacts from the proposed Project on flooding hazards are consistent with impacts described for the Silver State Solar Energy Project analyzed in the 2010 Final EIS. Modeling was used to inform design and location of the proposed Project. The existing site drainage was assessed using a hydrologic and hydraulic model (Louis Berger 2010). The results of the model were used to develop a site drainage design to accommodate a 100-year flood flow from the Lucy Gray Mountains. The design would use detention basins to capture runoff and discharge it to locations outside of the Project footprint. Another hydrologic study conducted in 2006 depicted five flood zones, ranging from no flood risk to very high flood risk, for the Ivanpah Valley (House 2006). Flood zones in the proposed Project area are primarily low to none, although areas of moderate, high, and very high are present (Figure 3.5-1).

Flash flooding can result in debris flow in desert environments. The alluvium at and surrounding the site could be transported during flash floods and damage on-site structures, such as solar panels, fencing, etc. Scour occurring at the footings of PV panels could cause PV panels to collapse, and be transported downstream with flood flows, resulting in damage to Project components on and off site (Louis Berger 2010). A more detailed discussion about panel footings and containment of flood debris can be found in *Section 4.5 Water Resources/Hydrology* under Effect WATER-4 in the 2010 Final EIS. The flooding hazard associated with the proposed Project would affect on-site workers and wildlife most. Mitigation measures **MM WATER-5** and **MM WATER-6** would be implemented to reduce flooding effects (*Section 2.7 Applicant-Proposed Measures and Mitigation Measures*, Table 2-4 in this document).

4.5.2.3 Alternative C - Alternative Layout

Impacts under Alternative C would be similar to impacts described for Alternative B, but impacts to surface waters would be greater due to the presence of waters of the U.S. Drainage for the site would be different; there would be four major drainages reinforced with berms that would transect the proposed Project site. This alternative would impact waters of the U.S. and require a Section 404 Permit because runoff would cross State lines. Alternative C would impact 9.20 acres of the 20.47 acres within the ROW application area that were determined to be waters of the U.S. More information about jurisdictional waters can be found in *Section 3.5.3 Jurisdictional Waters, Drainages, and Riparian Areas* in the 2010 Final EIS.

APM-1, APM-3 and APM-4 described in this document in *Section 2.7 Applicant-Proposed Measures and Mitigation Measures*, Table 2-3 would reduce impacts to jurisdictional waters, but the effect would remain adverse as grading near drainages could affect water quality and potentially flow within jurisdictional drainages. Groundwater recharge and quality would not be substantially impacted by the proposed Project under Alternative C. The risk of flooding under Alternative C would be the same as under Alternative B. The same mitigation measures would apply to Alternative C as are outlined for Alternative B. Additional mitigation measures to offset impacts to waters of the U.S. would be developed in consultation with the USACE following final engineering design.

4.5.2.4 Alternative D - Modification to Proposed Action Layout

Impacts under Alternative D would be similar to impacts described for Alternative B. Drainage for the site would be different; this alternative would be the most engineered for runoff and flood control using detention basins. Like Alternative B, Alternative D would not impact waters of the U.S. or require a Section 404 Permit. Groundwater recharge and quality, and surface water quality would not be substantially impacted by the proposed Project under Alternative D. The risk of flooding under Alternative D would be the same as under Alternative B. The same mitigation measures would apply to Alternative D as are outlined for Alternative B.

The designation of the ACEC under Alternative D would not substantially affect water resources within the 30,912-acre area under consideration. Management prescriptions proposed for the ACEC for development, recreation and other activities that would potentially impact these resources (refer to Table 2-2 in this document) would generally be similar or more restrictive when compared to existing management in this area. Therefore, the ACEC designation and related management prescriptions would have either no impacts or beneficial impacts to water resources.

4.5.2.5 BLM Preferred Alternative

The BLM Preferred Alternative would have no effects to jurisdictional drainages, similar to Alternative B or D. The design of this alternative minimizes alteration of natural drainages to the extent possible by placing arrays between drainages and allowing sheet flow across the site to the existing drainages. However, clearing and grading in and around drainages would be required for creation of level surfaces and maintenance/access roads.

Groundwater recharge and quality, and surface water quality would be minimally affected by the BLM Preferred Alternative. The risk of flooding under the BLM Preferred Alternative would be the same as under Alternative B, and the mitigation measures described to reduce flooding impacts from the Project would apply to the BLM Preferred Alternative. Impacts related to designation of the 31,859-acre ACEC would be as described for Alternative D.

4.5.3 Mitigation Measures

Detailed mitigation requirements and Applicant Proposed Environmental Protection Measures can be found in this document in *Section 2.7 Applicant-Proposed Measures and Mitigation Measures*, Table 2-3 and Table 2-4. Specific mitigation measures include:

MM WATER-1: Groundwater Metering Plan.

MM WATER-2: Operational Phase Erosion and Sedimentation Control Measures.

MM WATER-3: Flood Risk Control Measures.

MM WATER-4: Storm Water Monitoring and Response Plan.

MM WATER-5: Drainage Crossing Design.

APM-1: Erosion Control.

APM-3: Air/Dust Control.

APM-4: Preparation and Compliance with Project-specific SWPPP.

4.5.4 Residual Effects

Residual effects on water resources or hydrology resulting from implementation of the proposed Project or alternatives include a reduction in groundwater availability for other uses in the LVVWD; localized increases to sedimentation and scour in site drainages; a higher volume of concentrated storm water due to drainage structures; a potentially higher flood hazard, particularly due to the risk of detention basin collapse; and potentially altered drainage patterns due to the prevention of uninhibited channel migration within the site.

4.6 BIOLOGICAL RESOURCES

Biological resources in the regional area and the Silver State Solar Project study area are fully described in *Section 3.6 Biological Resources* in the 2010 Final EIS and are summarized in *Section 3.6* in this document. The CESA for biological resource is described in this document in *Section 4.19 Cumulative Impacts*.

4.6.1 Vegetation and Species Status Plant Species

4.6.1.1 Methodology

Impacts to vegetation resources were analyzed through a variety of methods including literature review, data provided by the Applicant, data from field studies conducted within the ROW application area, and discussions with resource personnel from BLM and USFWS.

4.6.1.2 Indicators

The Proposed Action would impact vegetation resources if it:

- Alters the structure, function, value, and persistence of Mojave desert scrub communities.
- Affects plant species such that the diversity or numbers of local populations were altered by interference with survival, growth, or reproduction.
- Destroys, degrades, or fragments habitat on a long-term basis.
- Introduces and/or increases the presence of invasive plants and noxious weed species.
- Impacts candidate or special status species populations or habitat so as to contribute to or result in the Federal or State listing of the species.

4.6.1.3 Direct and Indirect Effects by Alternatives

Alternative A - No Action Alternative

Under this alternative, the BLM would not approve the Applicant's ROW application and would not amend the RMP. The BLM would continue to manage land encompassing the Project area consistent with the existing RMP.

Because there would be no amendment and no solar project approved for the site under this alternative, it is expected that the site would continue to remain in its existing condition with no new structures or facilities constructed or operated on the site. As a result, none of the impacts to vegetation resources from the proposed Project would occur. In the absence of this Project, other renewable energy projects may be constructed to meet State and Federal mandates and those projects may have similar impacts in other locations.

Alternative B –Proposed Action

Up to 3,881 acres of mostly undeveloped desert lands would be cleared and graded to accommodate construction of the solar facility and ancillary facilities. During the operational life of the Project, minimal vegetation would exist within the facility. Permanent impacts would occur to areas that are paved or otherwise precluded from restoration to a pre-Project state. Mojave Desert vegetation communities generally have a slow recovery rate, but the recovery potential also depends on the nature and severity of the impact. Permanent impacts to vegetation would occur if there is no evidence that pre-disturbance levels of biomass, cover, density, soils, and plant community structure could be restored within approximately 5 years of disturbance.

Effect BIO-1: Introduce or spread non-native vegetation.

Project-related ground disturbing activities would create opportunities for the introduction and/or spread of non-native species. Invasive species can out-compete native species for water and space. Soil disturbance can also reduce the native seed bank associated with the site further limiting the ability of native plants to reestablish.

Of the 3,796 acres within the perimeter fence, approximately 235 acres would be covered by Project facilities and would not revegetate during the life of the Project. For the remaining 3,561 acres within the perimeter fence, the Applicant would allow vegetation to recolonize the area not covered by infrastructure. However, areas allowed to revegetate would be trimmed or mowed to a height of less than 12 inches to prevent contact with and/or shading of the solar modules. Therefore, during Project operation the composition of the plant community may shift to favor those species more tolerant of continual disturbance from mowing. This shift would likely favor invasive weed species because existing native plants would be less tolerant of this treatment and would be out-competed.

Non-native invasive species could also be introduced to the Project site during operation and maintenance activities that continue to curtail native vegetation growth. This continued soil disturbance on the Project site, as well the continued use of vehicles for maintenance activities such as washing of the PV panels and road maintenance, would increase the potential for the spread of non-native species on the Project site. In addition, vehicles brought to the Project site from other areas could introduce new non-native species if they are not properly washed. Weeds would be controlled through the use of BLM-approved herbicides and plant removal, in accordance with APM-9 Noxious Weed Control Plan and APM-17 Pesticide Use Proposal. The use of herbicides could result in the inadvertent mortality to native plant species.

Effect BIO-2: Damage or destroy special status plants.

No Federal or State-listed plant species were found during surveys of the ROW application area; however, two BLM sensitive species were found to be present: white-margined beardtongue and yellow twotone beardtongue. Alternative B does not include areas within the ROW application area where the white-margined beardtongue was found, but it does include most of the population of yellow twotone beardtongue that was located. Mitigation measures would be developed through agency coordination and included in the restoration plan. Mitigation may include seed collection, nursery development, transplantation of individuals, and/or sponsorship of the plant into the Center for Plant Conservation National Collection of Endangered Plants at Missouri Botanical.

Eleven species of cactus and yucca are present within the proposed footprint of Alternative B, occurring at greater densities with increasing elevation (Table 3.6-2). Under NRS 527.060-120, it is illegal for any company or individual to cut, destroy, mutilate, remove, or possess cactus and yucca, or portions of these plants “without written permission from the land’s legal owner or their duly authorized agent.” All cacti and yucca that are planned for removal would need to be approved and tagged by the BLM and their translocation coordinated. The BLM will require the preparation of a Salvage Plan as a stipulation of the ROW grant. Such a Plan would include quantification of temporary impact areas, how many plants the Applicant proposes to use for revegetation in those areas, how many would be sold, and how many they plan to destroy.

Alternative C - Alternative Layout

Impacts under Alternative C would be similar to those of Alternative B, except less acreage would be affected. Under Alternative C, up to 2,546 acres of desert vegetation would be cleared and graded to accommodate Project-related facilities. All other impacts to vegetation would be comparable to those described for Alternative B.

Special Status Plant Species

Alternative C would not directly impact the white-margined beardtongue or the yellow twotone beardtongue. The proposed footprint under this alternative is approximately 0.5 mile from the closest known occurrence of yellow twotone beardtongue. Therefore, there are no anticipated direct impacts to this species as a result of Project-related activities under this alternative. No indirect effects are anticipated, as any OHV travel routes that would be modified under Alternative C would not cross the white-margined beardtongue or yellow twotone beardtongue populations.

The types of impacts to cactus and yucca under Alternative C would be similar to those described for Alternative B. The estimated number of plants that would be affected is presented in Table 3.6-2.

Alternative D - Modification to Proposed Action Layout

Impacts from Project development under Alternative D would be similar to those of Alternative B except less acreage would be disturbed. Under Alternative D, up to 3,110 acres of desert vegetation would be cleared and graded to accommodate Project-related facilities. Designation of the ACEC under Alternative D would potentially reduce disturbance of native vegetation by future ground-disturbing actions in the 30,912-acre area under consideration. OHV use would be restricted to existing routes, and certain types of land use would be avoided or excluded from the ACEC. All other impacts to vegetation would be comparable to those described for Alternative B.

Special Status Plant Species

Alternative D would not directly impact the white-margined beardtongue; however, it would impact a portion of the yellow twotone beardtongue population. As under Alternative B, mitigation measures for impacts to special status plant species would be developed through agency coordination and included in the restoration plan. Mitigation may include seed collection, nursery development, transplantation of individuals, and/or sponsorship of the plant into the Center for Plant Conservation National Collection of Endangered Plants at Missouri Botanical Garden. The proposed Ivanpah Valley ACEC would encompass 13,795 acres of suitable habitat for the white-margined penstemon and 9.93 acres of suitable habitat for the yellow twotone beardtongue, which would benefit from reductions in the types and extent of future ground-disturbing actions.

The types of impacts to cactus and yucca under Alternative D would be similar to those described for Alternative B. The estimated number of plants that would be affected is presented in Table 3.6-2.

BLM Preferred Alternative

Impacts under the BLM Preferred Alternative would be similar to those of Alternative B, C or D, except less acreage would be affected. Under the BLM Preferred Alternative, up to 2,427 acres of desert vegetation would be cleared and graded to accommodate Project-related facilities. As with Alternatives B and D the BLM Preferred Alternative Project footprint would be over a mile from the border with the Ivanpah DWMA, limiting the potential for spread of noxious weeds from construction activities. Designation of the ACEC under the BLM Preferred Alternative would potentially reduce disturbance of native vegetation by future ground-disturbing actions in the 31,859-acre area under consideration. OHV use would be restricted to existing routes, and certain types of land use would be avoided or excluded from the ACEC. All other impacts to vegetation and required mitigation measures would be comparable to those described for Alternative B, C, or D.

Special Status Plant Species

The BLM Preferred Alternative would not affect known populations of the white-margined beardtongue. The proposed footprint under this alternative is approximately 1.8 miles from the nearest known occurrence of white-margined beardtongue, and 0.45 mile from the nearest known yellow twotone beardtongue population. No indirect effects would be anticipated, as the BLM Preferred Alternative would not modify any travel routes to cross through the yellow twotone beardtongue population. The ACEC designated under the BLM Preferred Alternative would encompass 13,795 acres of suitable habitat for the white-margined penstemon and 95.1 acres of suitable habitat for the yellow twotone beardtongue and would prohibit vehicle travel off of designated routes. The types of impacts to cactus and yucca under the BLM Preferred Alternative would be similar to those described for Alternative B, although fewer plants would be affected (Table 3.6-2).

4.6.1.4 Mitigation Measures

Detailed mitigation requirements and APMs can be found in this document in *Section 2.7 Applicant-Proposed Measures and Mitigation Measures*, Table 2-3 and Table 2-4. Specific mitigation measures include:

MM BIO-1: *Preconstruction Surveys.*

MM BIO-2: *Best Management Practices.*

MM BIO-3: *Biological Monitors.*

MM BIO-4: *Facility Siting.*

MM BIO-5: *Yellow Twotone Beardtongue Measures.*

MM BIO-6: *Cactus and Yucca Salvage Plan.*

APM-1: *Erosion Control.*

APM-3: *Air/Dust Control.*

APM-4: Storm Water Pollution Prevention Plan.

APM-5: Spill Prevention, Control, and Countermeasures Plan.

APM-9: Noxious Weed Control Plan.

APM-10: Site Rehabilitation Plan and Facility Decommissioning Plan.

APM-12: Vegetation Trimming.

APM-14: Environmental Clearance.

APM-16: Establish a Plant Nursery during Clearing of the Project Site.

APM-17: Pesticide Use Proposal

4.6.1.5 Residual Effects

The mitigation measures identified in the previous section would not mitigate all impacts. Residual impacts would include the long-term removal or disturbance of habitat in all areas occupied by the Project. Additionally, it is still possible that invasive weeds could be introduced in the area following construction during operations and maintenance of the facility. The combination of continued mowing, herbicide use, artificial shading from the solar panels, and the introduction of water through panel washing could result in conditions that favor noxious weeds. It is anticipated that the Noxious Weed Control Plan will be developed in such a way that it could be adapted to changing conditions.

4.6.2 Wildlife and Species Status Wildlife Species

4.6.2.1 Methodology

Analyses for impacts to wildlife resources were accomplished through a variety of methods including literature review, data provided by the Applicant, data from field studies conducted within the ROW application area, and discussions with resource personnel from BLM and USFWS.

4.6.2.2 Indicators

The Proposed Action would impact wildlife resources if it:

- Affects wildlife species such that the diversity or numbers of local populations were altered by interference with survival, growth, or reproduction.
- Interrupts daily and/or seasonal wildlife movement and connectivity corridors.
- Destroys, degrades, or fragments habitat on a long-term basis.
- Introduces environmental changes that increase opportunities for predators of special status species.

- Impacts candidate or special status species populations or habitat so as to contribute to or result in the Federal or State listing of the species.

4.6.2.3 Direct and Indirect Effects by Alternatives

Alternative A - No Action Alternative

Under this alternative, the BLM would not approve the Applicant's ROW application and would not amend the RMP. The BLM would continue to manage land encompassing the Project area consistent with the existing RMP.

Because there would be no amendment and no solar project approved for the site under this alternative, it is expected that the site would continue to remain in its existing condition with no new structures or facilities constructed or operated on the site. As a result, none of the impacts to wildlife resources from the proposed Project would occur. In the absence of this Project, other renewable energy projects may be constructed to meet State and Federal mandates and those projects would have similar impacts in other locations.

Alternative B – Applicant's Proposed Project

Effect BIO-3: Adversely affect wildlife populations or remove wildlife habitat.

Clearing and disturbance of up to 3,881 acres of vegetation would directly impact wildlife resulting in loss and fragmentation of habitat for cover, breeding, traveling, and foraging. Equipment and vehicles can also collide with slower-moving species, species in subsurface burrows, and ground-nesting birds resulting in mortality. Some species such as American badgers are vulnerable to crushing as they are unlikely to leave their burrows when cornered. Most wildlife species are susceptible to visual and noise disturbances caused by the presence of humans and construction equipment. Such disturbances can result in the alteration of species' foraging and breeding behavior.

Impacts to avian species could result from nest abandonment or loss of chicks or eggs in active nests, mortality of adults due to collision, or reduction of potential forage and nesting habitat. For most bird species, direct impacts would be limited to areas within the Project footprint or immediately adjacent to it. Active bird nests in shrubs or near the ground would be vulnerable to crushing during ground-disturbing activities. Many bird species rely on vocalization during the breeding season to attract a mate within their territory. Noise levels from certain construction, operations, and decommissioning activities could reduce the reproductive success of nesting birds.

The most common wildlife responses to noise and human presence are avoidance or accommodation. Avoidance would result in displacement of wildlife from an area larger than the actual disturbance area. The total extent of habitat lost as a result of wildlife avoidance response is impossible to predict since the degree of this response varies from species to species, and can even vary between different individuals of the same species. Also, after initial avoidance of human activity and noise producing areas, certain wildlife species may acclimate to the activity and begin to reoccupy areas formerly avoided. Wildlife avoiding habitat in the vicinity of the Project area may opt for less suitable habitat which would increase stress on these individuals as

a result of increased energetic costs. This would also place additional stress on available resources through increased wildlife density in off-site areas.

The permanent fencing of the Project area would reduce access for terrestrial species resulting in habitat fragmentation. This fragmentation would cause wildlife to rely more heavily on habitat within the surrounding area for foraging, shelter, and nesting opportunities. This may result in an indirect effect on wildlife inhabiting areas adjacent to the Project area. These individuals may experience increased competition as a result of the displaced individuals relocating into their home ranges. This may include wildlife inhabiting the Ivanpah DWMA.

The Project may indirectly result in mortality to wildlife through an increased risk of predation. Some predator species such as ravens and coyotes are attracted to human activity. Installation of fencing and transmission towers create additional perching structures from which ravens and raptors may hunt for prey. Construction, operation, and maintenance of the Project would result in trash and debris that would further attract species such as ravens and coyotes.

Effect BIO-4: Harm or kill special status wildlife species, remove habitat for special status species, or interrupt connectivity between populations of special status species.

Reptiles

Three special status reptile species potentially occur within the Project footprint: desert tortoise, Gila monster, and chuckwalla. Desert tortoise is addressed separately below. Gila monster and chuckwalla are BLM-sensitive species and were not detected during pedestrian surveys; however, they have a moderate potential to occur based on the available habitat. Ground-disturbing activities could result in injury or mortality to individuals above or below the surface. Increased vehicle use of the area could result in injury or mortality throughout the life of the Project. Under Alternative B, up to 3,881 acres of wildlife habitat would be lost. However, Gila monsters and chuckwallas tend to inhabit more rugged areas with steeper slopes and rocks to bask on. Because the Project area is mostly flat or gently sloping land, it is anticipated that direct impacts to these species would be relatively minor.

Desert Tortoise

The desert tortoise is the only species listed under the ESA known to inhabit the Project area. Surveys detected 20 adult tortoises within the disturbance area of Alternative B. It is estimated that between 19 and 132 tortoises (based on 95% confidence interval) may inhabit the footprint area with an estimated density of between 3 and 22 tortoises per square mile (Ironwood Consulting 2012). Project-related activities could result in the direct mortality, injury, or harassment of active tortoises as a result of encounters with heavy equipment or vehicles. Tortoises or their eggs could also be crushed or buried within burrows. Tortoise behavior may be disturbed as a result of noise and vibration during construction.

Indirect effects to desert tortoises could occur as a result of increased predation or changes to habitat outside the Project area. Predation pressure can be increased locally through any activities that would attract predators to the Project area, including the presence of supplemental food or water. Although raptors and ravens use transmission structures as nest substrates and hunting perches, the gen-tie line would be parallel to existing transmission lines and is not anticipated to result in increased predation pressure. Portions of the boundary fence do not parallel existing

structures, and may provide a hunting perch for predatory birds. Changes to the vegetation community within the boundary fence, including the potential for increased numbers of non-native plants, may affect undisturbed areas outside the boundary fence through the spread of seeds, which may in turn affect the amount and quality of forage available for desert tortoises.

Under Alternative B, up to 3,881 acres of desert tortoise habitat would be disturbed and occupied by Project-related facilities. However, of similar importance to the loss of habitat is the fragmentation of the remaining tortoise habitat in the Ivanpah linkage corridor. The Ivanpah Valley already contains existing developments that limit connectivity such as I-15, developments in Primm and the existing railroad. Desert tortoises west of I-15 within the Ivanpah Valley from Primm to Jean are isolated from tortoises east of I-15 due to the Large Scale Translocation Site (LSTS) fencing. As a result, it is assumed that these features have already reduced genetic flow east-west within the tortoise population of the Ivanpah Valley.

The USFWS currently assesses the viability of linkages based on the ability of those linkages to accommodate a desert tortoise's entire life history (lifetime utilization area). As an individual desert tortoise may use up to 1.5 square miles of habitat throughout its life, the USFWS estimates that a linkage would need to be at least 1.4 miles wide to accommodate a single, circular home range (USFWS 2011). In general, linkages may require that multiple home ranges be accommodated to function optimally, although no information is available on linkage size or configuration required to maintain connectivity between desert tortoise populations (USFWS 2012).

Previous studies have estimated that tortoises in the vicinity of the proposed Project used home ranges of 0.10 to 0.66 mile in diameter (Ironwood Consulting 2012). None of these studies provided separate estimates of male and female home range sizes, although males typically use larger home ranges than females. These studies were conducted over relatively short time periods (2-4 years), and do not provide estimates of the lifetime utilization area of desert tortoises in the Ivanpah Valley. Movement studies are currently ongoing within and adjacent to the ROW Application Area with the goal of assessing desert tortoise movement through high-elevation passes in the Lucy Gray and McCullough mountains. These studies are also intended to further evaluate home range sizes within the immediate vicinity of the ROW application area prior to construction of the Project. Following construction, ongoing ~~monitoring of translocated desert tortoises would occur, as would~~ studies intended to assess the status of desert tortoises within the remaining corridor east of the Project area and the Ivanpah Valley would occur (Ironwood Consulting 2012).

The area that lies between the Silver State North Project and the Lucy Gray Mountains is the most viable linkage between the northern and southern portions of the Ivanpah Valley. It is thought that severing this corridor would effectively isolate the northern portion of the valley from the southern by forcing tortoises to move through passes to the east side of the Lucy Gray Mountains (USFWS 2011a), as the LSTS fencing limits or prevents desert tortoise movement north-south through the Ivanpah Valley west of I-15. Currently, the narrowest point in the existing corridor between Roach Lake and bedrock slopes in the Lucy Gray Mountains is approximately 1.3 miles, at the northern end of the ROW application area. Although desert tortoise density was highest midway up the bajada, tortoises and burrows were recorded nearly at the edge of the Roach Lake playa (Ironwood Consulting 2012), and the entire width is assumed to be a functional corridor.

Under Alternative B, this linkage would be reduced to approximately 100 feet wide at its narrowest point when considering the proposed drainage channel which would include riprap. Much of the eastern side of the proposed footprint is located approximately 0.2 mile from the Lucy Gray Mountains. This would likely eliminate the effectiveness of the ROW application area as a corridor between the northern and southern portions of Ivanpah Valley. Isolating these populations would restrict gene flow and further genetically isolate populations in Nevada and Utah from those in California. Isolated populations may be vulnerable to inbreeding depression, and may recover slowly from events such as disease or fire where immigration could otherwise occur. Successful recovery of the species depends on the recovery of individual populations within each recovery unit.

Birds

The Project area provides habitat for cover, breeding, foraging, and/or traveling for seven special status bird species: the golden eagle, peregrine falcon, prairie falcon, western burrowing owl, loggerhead shrike, LeConte's thrasher, and crissal thrasher. Western burrowing owl, loggerhead shrike, LeConte's thrasher, and crissal thrasher most likely use the Project area for nesting and foraging. These species would be vulnerable to loss of nesting habitat and behavioral disruptions due to noise and vibrations during construction. Alteration of foraging behavior during nesting season could result in nest abandonment or malnourished chicks.

Prairie falcons and peregrine falcons would use the Project area for foraging as there is no suitable nesting habitat present. Alteration in foraging behavior could result in nest abandonment or decreased fitness of adults and chicks. Falcons are also susceptible to injury as a result of collision with powerlines and transmission structures or from electrocution. However, given the numerous transmission lines and structures already present in the immediate vicinity of the Project area, it is unlikely that the addition of the proposed generation tie-line would result in an adverse impact to falcons.

Like the falcons described above, golden eagles would only be impacted as a result of the loss of foraging habitat. Eagles require large areas for foraging, whether as dispersed, non-nesting adults or as pairs defending a nest and territory. Human disturbance has been known to result in nest abandonment by eagles. The closest documented nest is located in the Lucy Gray Mountains approximately 0.85 mile from the ROW application area, and 2.5 miles from the nearest proposed footprint (USFWS 2013). The timing, visibility, and proximity of construction activities would affect the likelihood of nest abandonment by eagles as a result of the Project. Golden eagles may be susceptible to injury and/or mortality from collision with powerlines and transmission structures or electrocution. Because the Project would follow Avian Power Line Interaction Committee guidelines, it is unlikely that the addition of the proposed generation tie-line would result in an adverse impact to golden eagles.

Mammals

There are six special status bat species that potentially occur within the Project area. The Project would result in a loss of only foraging habitat for these species as no suitable roosting habitat is present. The loss of natural vegetation could also decrease the prey availability within the Project area. Artificial lighting could alter bat foraging behavior as insects would likely congregate under these light sources allowing bats to concentrate foraging activities in these locations.

Desert bighorn sheep are not known to inhabit the Project area for lambing or foraging. The Project is not anticipated to inhibit the movement of bighorn sheep between mountain ranges. Existing structures such as I-15 and LSTS fencing already prohibit east-west movement across the valley and the Project would not inhibit north-south movement as the sheep can easily navigate the Lucy Gray Mountains. If present, bighorn sheep may be vulnerable to noise, vibration, and visual disturbance.

Desert kit fox are known to inhabit the Project area. There is a potential for mortality due to the collapse of occupied burrows during ground-disturbing activities. Visual and noise disturbance could result in habitat avoidance, which would increase stress on the animals from difficulty in foraging. As the acreage to be occupied by the Project is small relative to a kit fox territory and extensive suitable habitat is available, it is anticipated that minimal impacts to the kit fox would occur.

Alternative C - Alternative Layout

Impacts to wildlife under Alternative C would be similar to those of Alternative B except that less acreage would be disturbed. Under Alternative C, up to 2,546 acres of wildlife habitat would be cleared and graded to accommodate Project-related facilities. All other impacts to wildlife would be comparable to those described for Alternative B.

Special Status Wildlife Species

Desert Tortoise

Impacts to the desert tortoise under Alternative C would be similar to those under Alternative B; however, only 2,546 acres of habitat would be occupied by Project-related facilities. The most notable difference would be that the connectivity corridor between the Project footprint and the Lucy Gray Mountains would be approximately 1.5 miles wide. This remaining corridor would be wider than the corridor formed by Alternative B, and would be approximately the width of the narrowest portion of the existing corridor at the northern end of the ROW application area. However, current research does not indicate whether these further reductions in the width or configuration of the corridor would reduce or eliminate its ability to maintain the genetic linkage between populations north and south of the Project area.

Alternative D - Modification to Proposed Action Layout

Impacts under Alternative D would be similar to those of Alternative B except less acreage would be disturbed. Under Alternative D, up to 3,110 acres of wildlife habitat would be cleared and graded to accommodate Project-related facilities. Designation of the ACEC under Alternative D would provide additional protection for wildlife, including special-status species. Restricting OHV use to existing routes would reduce the risk of collisions with desert tortoises and other wildlife. Avoidance of linear ROWs and exclusion of ROWs for large sites (over 5 acres) would reduce the potential for future habitat fragmentation for all wildlife. Additional management prescriptions proposed within the ACEC would be similar to existing management or have relatively minor benefits to wildlife. All other impacts to wildlife would be comparable to those described for Alternative B.

Special Status Wildlife

Desert Tortoise

Impacts to the desert tortoise under Alternative D would be similar to those under Alternative B. The primary difference would be that the connectivity corridor between the Project footprint and the Lucy Gray Mountains would be approximately 0.5 miles wide at its narrowest point with most of the linkage having a width of 0.8 mile. This remaining corridor would be intermediate to the corridors formed by Alternatives B and C, and would be less than half the width of the narrowest portion of the existing corridor at the northern end of the ROW application area. However, current research does not indicate whether these further reductions in the width or configuration of the corridor would reduce or eliminate its ability to maintain the genetic linkage between populations north and south of the Project area.

BLM Preferred Alternative

Impacts to wildlife and special status wildlife species under the BLM Preferred Alternative would be similar to those of Alternative B, C, or D except that less acreage would be disturbed than under the other alternatives and construction activities would likely occur over a shorter period. Under the BLM Preferred Alternative, up to 2,427 acres of wildlife habitat would be cleared and graded to accommodate Project-related facilities. Impacts related to designation of the ACEC would be as described for Alternative D. All other impacts to wildlife would be comparable to those described for Alternative B, C, or D.

Special Status Wildlife Species

Desert Tortoise

Impacts to the desert tortoise under the BLM Preferred Alternative would be similar to those under Alternative B. The primary difference would be that the connectivity corridor between the Project footprint and the Lucy Gray Mountains would be approximately 1.26 miles wide at its narrowest point with most of the linkage having a width of approximately 1.53 miles. This remaining corridor would be greater than the corridors formed by Alternatives B, C, or D, and would be generally consistent than the existing 1.3-mile corridor at the northern end of the ROW application area. However, current research does not indicate whether reductions in the width or configuration of the corridor compared to existing conditions would reduce or eliminate its ability to maintain the genetic linkage between populations north and south of the Project area. Impacts related to designation of the ACEC would be as described for Alternative D.

4.6.2.4 Mitigation Measures

Detailed mitigation requirements and Applicant Proposed Environmental Protection Measures can be found in this document in *Section 2.7 Applicant-Proposed Measures and Mitigation Measures*, Table 2-3 and Table 2-4. Specific mitigation measures include:

MM BIO-1: Preconstruction Surveys.

MM BIO-2: Best Management Practices.

MM BIO-3: Biological Monitors.

MM BIO-4: Facility Siting

MM BIO-7: Worker Environmental Awareness Program.

MM BIO-8: Migratory Birds and Raptors Impacts Reductions Measures.

MM BIO-9: Bird and Bat Conservation Strategy.

MM BIO-10: Avian Protection

MM BIO-11: Western Burrowing Owl Measures.

MM BIO-12: Gila Monster and Chuckwalla Measures.

MM BIO-13: Reduced Night Lighting.

MM BIO-14: Cover Steep Walled Trenches or Excavations During Construction.

MM BIO-15: American Badger and Desert Kit Fox Impacts Reduction Measures.

MM BIO-16: Desert Bighorn Sheep Measures

MM BIO-17: Desert Tortoise Measures.

APM-1: Erosion Control.

APM-3: Air/Dust Control.

APM-8: Waste Management Plan.

APM-10: Site Rehabilitation Plan and Facility Decommissioning Plan.

APM-14: Environmental Clearance.

4.6.2.5 Residual Effects

For all wildlife species, there would be long-term residual effects due to the loss of up to 3,881 acres of habitat through construction of the Project. The loss of habitat includes the loss of foraging areas, shelter, and nesting habitat. Because the majority of this area would be located within the fenced portion of the facility, wildlife too large to fit through the fence or unable to fly or climb over the fence would be unable to utilize whatever resources regenerate within this area. As a result of this loss of habitat, affected wildlife would rely more heavily on habitat outside the Project area, increasing the density of individuals in these areas and the pressure on the habitat resources.

All desert tortoises found during pre-construction surveys within the Project footprint would be translocated in accordance with BLM and USFWS protocols and an approved translocation plan. Handling and relocating of tortoises would result in harassment and may result in injury or death of individual tortoises. Translocation activities may also impact tortoises already residing

in the translocation area. This is especially true if translocated tortoises are infected with upper respiratory tract disease (URTD; *Mycoplasma agassizii*). The introduction or spread of URTD could result in the illness and mortality of infected individuals. Following hygiene procedures in the translocation guidance should minimize the spread of URTD. Additionally, increasing population sizes in the translocation area will result in increased competition and stress on resources.

Tortoises will be translocated and the translocation site will be determined by the BLM in coordination with USFWS through the approval of the translocation plan for the proposed Project. The Biological Opinion (BO) for this Project will contain any additional mitigation measures and requirements for desert tortoise to minimize adverse impacts.

If approved, the Project would include ongoing research to determine whether the connectivity corridor has been narrowed by the Project to a point where its effectiveness has been compromised or even eliminated by way of the area being unoccupied.

4.7 CULTURAL RESOURCES

Cultural resources in the regional area and the Silver State Solar Project study area are described in *Section 3.7 Cultural Resources* in the 2010 Final EIS and are summarized in *Section 3.7* of this document. The CESA for cultural resource is described in this document in *Section 4.19 Cumulative Impacts*.

4.7.1 Methodology

In general, the Proposed Action could affect cultural resources by either directly or indirectly altering the characteristics of a historic property that is eligible for inclusion on or listed in the NRHP (36 CFR 800.5). For the Proposed Action, the direct ROI included the Project footprint by alternative, and the indirect ROI included a two-mile buffer from the perimeter of each Project footprint by alternative. The indirect ROI was considered for visual effects that could diminish the integrity of potential cultural resources. These ROIs were determined in consultation with the State Historic Preservation Office (SHPO). Per Section 106 of the NHPA, any effects of the proposed undertaking on properties eligible for the NRHP must be analyzed by applying the Criteria of Adverse Effect:

An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration is given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the NRHP. 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.

4.7.2 Indicators

The Proposed Action would adversely impact cultural resources if it would result in:

- Physical destruction or damage to all or part of the property;
- Change in the character of the property's use of physical features within a property's setting that contribute to its historic significance;
- Alteration of a property that is not consistent with the Secretary's Standards for the Treatment of Historic Properties and applicable guidelines;
- Removal of the property from its historic location;
- Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features; or
- Disturbance to any human remains, including those interred outside of formal cemeteries.

4.7.3 Direct and Indirect Effects by Alternatives

This section describes the effects under each alternative using the respective methodology prescribed under NEPA *and NHPA*. No direct or indirect effects were identified for this resource.

4.7.3.1 Alternative A - No Action Alternative

Under the No-Action Alternative, the proposed Project would not be built, the proposed Project area would not be disturbed, *and no amendments would be made to the LVFO RMP*; therefore, Alternative A would have no effect on cultural resources.

4.7.3.2 Alternative B - Applicant's Proposed Project

Alternative B is similar to the Proposed Action (Alternative 2) as described in the September 2010 Final EIS, but Project facilities would be sited further north and include portions of the new ROW application area. The ROI for cultural resources is the anticipated disturbance area of 3,887 acres of disturbed and undisturbed lands. This area includes 2.87 miles of maintenance roads. ~~The ROI for access was defined as~~ *with* 60 meters (200 feet) on each side of the road centerline.

Based on the complete cultural inventory of the proposed Project's updated ROW application area and the overlapping area of preferred alternative evaluated in the 2010 Final EIS, 23 prehistoric and/or historic cultural sites were recorded and evaluated as to whether they were eligible for listing on the NRHP, *and fifteen were recommended not eligible*. ~~The BLM and The Nevada SHPO both concurred that eight-nine sites are eligible properties within the ROW application area, eight of which fall within the ROI. Within the direct ROI one historic site is eligible under Criteria "a" and "c." Within the indirect ROI there are five historic sites: four historical period sites eligible under Criteria "a" and "c", one historical period site that is eligible under Criterion "d". There is also one prehistoric site eligible under Criterion "d".~~ ~~four historical period sites eligible under Criterion a and c, and one historical period site that is eligible under Criterion a.~~ Four of the sites, electrical-transmission lines, have their own protected ROW and will not be ~~otherwise~~ affected by the proposed Project. *None of the sites*

situated within the ROI would be adversely affected, either directly or indirectly, by the Project. The remaining four eligible properties are located outside of the Project area and as such would be avoided. ~~These sites would not be directly or indirectly affected by construction of Alternative B.~~ To ensure *that there will not be any* impacts to cultural resources ~~would occur~~, MM CULT-1 (Section 2.7 Applicant-Proposed Measures and Mitigation Measures, Table 2-4 in this document) would establish protections for undiscovered *cultural resources, including* human remains.

4.7.3.3 Alternative C - Alternative Layout

Alternative C is based on the preferred alternative as described by the BLM in the September 2010 Final EIS released for the original Silver State Solar Energy Project. The ROI for cultural resources, *which included the now built Silver State North Project footprint*, was determined to be approximately 3,009 acres of disturbed and undisturbed lands. This area includes approximately 2,967 acres associated with infrastructure, 35 acres associated with an existing 1.55-mile-long maintenance and access road following power transmission lines, and 7 acres related to a 0.3-mile-long alternative access road connecting with an existing power generation facility. The ROI for each access road was defined as 60 meters (200 feet) on each side of the road centerline.

The Class III inventory for the Final EIS resulted in the identification of 23 newly recorded and 5 previously recorded cultural resource sites within the ROI. Three have been determined as eligible for the NRHP, two are prehistoric and one is historic. Two of the sites, 26CK1620/8282 and 26CK2632/8280 are prehistoric and located along the access road into the proposed Project area but outside the actual road footprint. These sites would not be directly affected by improvements made to the access road for the Project.

Site 26CK5685, a culvert that was identified during Statistical Inc.'s 2009 survey, was found in association with the SP, LA & SL/UP Railroad, lies within the visual ROI of the current Project. The BLM and SHPO determine that there will not be an adverse effect to this site since the proposed Project would result in the development of infrastructure similar in kind to the present conditions, which would not represent an effect given that the site is eligible under criterion "d".

The BLM and SHPO also determine that the HAER documentation concerning the Boulder Dam Power line (26CK5180a, 26CK6237, 26CK6238, and 26CK6242) supports the continued eligibility of this linear feature. BLM and SHPO determine that the Project will not have an adverse effect to these sites since the proposed undertaking would also result in the development of infrastructure similar to existing visual effects e.g., transmission lines and power plants.

In sum, through consultation with Nevada SHPO, the BLM determines that within the direct and indirect ROI five sites are National Register-eligible; e.g., sites 265180a, 265685, 26CK6237, 26CK6238, 26CK6242, 26CK8294, 26CK8290, 26CK8755, for the visual/indirect effects resulting from the proposed undertaking overall would be in-kind with the present effects of the existing transmission lines and power plants, and that there will not be any adverse effects to any sites eligible for listing in the NRHP under criterion "d" (Appendix I).

~~Site 26CK5180a is a historic transmission line that was constructed from the Boulder/Hoover Dam to Los Angeles. That site is not part of the Project ROI as it occupies its own ROW and would not be affected by the proposed Project. The transmission line was not formally evaluated for NRHP eligibility for this Project; however, it has been determined as eligible in other locations. The site would be removed and replaced with upgraded lines as part of SCE's Eldorado to Ivanpah Transmission Project between California and Nevada. That undertaking is the subject of the Eldorado to Ivanpah Transmission Project EIR/EIS with the California Public Utilities Commission as the lead CEQA agency and the BLM in California as the lead NEPA agency. Removal and upgrade of the line has been determined to be an adverse effect which would be resolved by documentation of the resource for the National Historic American Engineering Record.~~

4.7.3.4 Alternative D - Modification to Proposed Action Layout

Alternative D is similar to Alternative C, but includes a modified layout and includes portions of the new ROW application area. The ROI for cultural resources is the anticipated disturbance area of 3,110 acres of disturbed and undisturbed lands. This area includes 2.45 miles of maintenance roads. ~~The ROI for access was defined as, with~~ 60 meters (200 feet) on each side of the road centerline.

Based on the complete cultural inventory of the proposed Project's updated ROW application area and the overlapping area of preferred alternative evaluated in the 2010 Final EIS, 23 prehistoric and/or historic cultural sites were recorded and evaluated as to whether they were eligible for listing on the NRHP. Within the ROI, ~~The BLM and the Nevada SHPO both~~ concurred that eight sites are eligible properties, including three prehistoric sites that are eligible under Criterion d, four historical period sites eligible under Criteria "a" and "c", and one historical period site that is eligible under Criterion a"d".

BLM and SHPO also determine that the HAER documentation concerning the Boulder Dam Power line (26CK5180a, 26CK6237, 26CK6238, and 26CK6242) supports the continued eligibility of this linear feature. BLM and SHPO determine that the project will not have an adverse effect to these sites since the proposed undertaking would also result in the development of infrastructure similar to existing visual effects e.g., transmission lines and power plants.

Through consultation with Nevada SHPO, the BLM determines that within the direct and indirect ROI five sites are National Register-eligible; e.g., sites 265180a, 265685, 26CK6237, 26CK6238, 26CK6242, 26CK8294, 26CK8290, 26CK8755, for the visual/indirect effects resulting from the proposed undertaking overall would be in-kind with the present effects of the existing transmission lines and power plants, and that there will not be any adverse effects to any sites eligible for listing in the NRHP under criterion "d" (Appendix I).

~~Four of the sites, electrical transmission lines, have their own protected ROW and would not be otherwise affected by the proposed Project. The remaining four eligible properties are located outside of the Project area and as such would be avoided. These sites would not be directly or indirectly affected by construction of Alternative D. The remaining 15 sites were recommended not eligible for listing on the NRHP~~

The designation of the ACEC under Alternative D would not substantially affect cultural resources within the 30,912-acre area under consideration. Management prescriptions proposed for the ACEC for development, recreation and other activities that would potentially impact these resources (refer to Table 2-2 in this document) would generally be similar or more restrictive when compared to existing management in this area. Therefore, the ACEC designation and related management prescriptions would have either no impacts or beneficial impacts to cultural resources.

4.7.3.5 BLM Preferred Alternative

The BLM Preferred Alternative is similar to Alternative C, but includes a modified layout and includes portions of the new ROW application area. The ROI for cultural resources is the anticipated disturbance area of approximately 2,427 acres of disturbed and undisturbed lands. Impacts to cultural resources would be similar to those described under Alternative B or D, with potential impacts lessened due to the smaller Project footprint. Impacts related to designation of the 31,859-acre ACEC would be as described for Alternative D.

4.7.4 Mitigation Measures

Detailed mitigation requirements can be found in this document in *Section 2.7 Applicant-Proposed Measures and Mitigation Measures*, Table 2-4. Specific mitigation measures include:

MM CULT-1: Protection of Cultural Resources

4.7.5 Residual Effects

There would be no residual effects to any or the qualities that would affect inclusion in the NRHP. NRHP-eligible cultural resources in the proposed Project area or along the access roads during implementation of this Project. *There would be no adverse effects to any NRHP-eligible cultural resources in the proposed Project area or along the access roads during implementation of this Project for any of the project alternatives. There would be no physical destruction, damage, inappropriate changes or alterations or removal of historic properties, and no disturbance to human remains. There would also be no indirect effects to visual, atmospheric, or audible elements of a historic property. Tribal consultation resulted in the identification of no sites of interest or concern for cultural, ceremonial, or spiritual values.*

4.8 PALEONTOLOGICAL RESOURCES

Paleontological resources in the regional area and the previously analyzed ROW application area are fully described in *Section 3.8 Paleontological Resources* in the 2010 Final EIS and summarized in *Section 3.8* in this document. The paleontological resources within the current ROW application area are also described in *Section 3.8* in this Supplemental EIS/PRMPA. The CESA for paleontological resources is described in *Section 4.19 Cumulative Impacts* in this document.

4.8.1 Methodology

NEPA requires that important natural attributes of our national heritage are considered when assessing the environmental consequences of any Proposed Action. NEPA does not refer to paleontological resources specifically; however, NEPA Section 101(b)(4) states that it is the responsibility of the Federal government to “preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity, and variety of individual choice.” NEPA does not provide impact indicators specifically for paleontological resources. However, it is the policy of the BLM that potential effects on scientifically significant paleontological resources be identified and proper mitigation is implemented (BLM 2008).

4.8.2 Indicators

Pursuant to BLM policy, the Proposed Action would adversely affect paleontological resources if it would:

- Damage or destroy known paleontological resources; or
- Cause the loss of valuable scientific information by disturbing the geology in which fossils are found.

4.8.3 Direct and Indirect Effects by Alternative

This section describes the effects under each alternative using the respective methodology prescribed under NEPA.

4.8.3.1 Alternative A - No Action

Under Alternative A, there would be no construction or operational activities from the proposed Project, the ROW application area would not be disturbed, and the BLM would not amend the RMP. The BLM would continue to manage land encompassing the Project area consistent with the existing RMP.

Because there would be no RMP amendment and no solar project approved for the site under this alternative, it is expected that the site would continue to remain in its existing condition with no new structures or facilities constructed or operated on the site. As a result, none of the impacts to paleontological resources from the proposed Project would occur. In the absence of this Project, other renewable energy projects may be constructed to meet State and Federal mandates and those projects would have similar impacts in other locations.

4.8.3.2 Alternative B - Applicant’s Proposed Project

For the purposes of analyzing impacts on paleontological resources, the ROI under Alternative B would be limited to 3,881 acres that would be disturbed during construction. As discussed in *Section 3.8.1, Existing Paleontological Resources*, the results of a paleontological assessment

(CH2M HILL 2011) concluded that the proposed disturbance area is underlain by sediment with a PFYC Class of 2 (low paleontological sensitivity).

However, as discussed in Chapter 3, fossils may exist at subsurface depths of more than 10 feet in areas of the proposed Project site underlain by eolian and playa fringe. These fossils, if they exist, would be affected by trenching and excavation activities that would involve subsurface ground disturbance of more than 10 feet. Any possible paleontological resources obtained by Project-related drilling and auguring would not be scientifically significant on the basis of the nature of extraction and therefore are not subject to any paleontological monitoring.

Effect PALEO-1: Possible destruction of/disturbance to buried or unknown paleontological resources.

The results of the paleontology literature and records review for the ROI indicate that the proposed Project site has a low potential to affect significant nonrenewable fossil resources because the formation in the Project area has a low potential to contain fossils.

4.8.3.3 Alternative C - Alternative Layout

Alternative C would be constructed and operated similarly to Alternative B for every Project component, with the exception of the drainage plan. The construction disturbance area and permanent construction disturbance area would be reduced with Alternative C; however, the type, intensity, and duration of effects to paleontological resources would be similar to that of Alternative B. The mitigation prescribed for Alternative B would be applicable for Alternative C.

4.8.3.4 Alternative D - Modification to Proposed Action Layout

Alternative D would be constructed and operated similarly to Alternative B on every Project component, with the exception of the drainage plan. The construction disturbance area and permanent construction disturbance area would be reduced with Alternative D; however, the type, intensity, and duration of effects to paleontological resources would be similar to that of Alternative B. The Project design feature and mitigation prescribed for the Alternative B would be applicable for Alternative D.

The designation of the ACEC under Alternative D would not substantially affect paleontological resources within the 30,912-acre area under consideration. Management prescriptions proposed for the ACEC for development, recreation and other activities that would potentially impact these resources (refer to Table 2-2 in this document) would generally be similar or more restrictive when compared to existing management in this area. Therefore, the ACEC designation and related management prescriptions would have either no impacts or beneficial impacts to paleontological resources.

4.8.3.5 BLM Preferred Alternative

The BLM Preferred Alternative would be constructed and operated similarly to Alternative B for every Project component, with the exception of the drainage plan. The construction disturbance area, permanent construction disturbance area, and duration of construction effects to

paleontological resources would be substantially smaller with the BLM Preferred Alternative as compared to Alternative B, C, and D. The mitigation prescribed for Alternative B would be applicable for the BLM Preferred Alternative. Impacts related to designation of the ACEC would be as described for Alternative D.

4.8.4 Mitigation Measures

Detailed mitigation requirements can be found in this document in Section 2.7 Applicant-Proposed Measures and Mitigation Measures, Table 2-4. Specific mitigation measures include:

MM PALEO-1: Paleontological Mitigation

4.8.5 Residual Effects

No residual effects on paleontological resources would result from implementation of the Proposed Action or alternatives.

4.9 LANDS AND REALTY

Land uses in the Silver State Solar Project study area are described in *Section 3.9 Lands and Realty* in the 2010 Final EIS and summarized in *Section 3.9* in this document. The CESA for lands and realty is described in this document in *Section 4.19 Cumulative Impacts*.

4.9.1 Indicators

An impact on land use may result if the Proposed Action were to:

- Conflict with existing Federal, State, or local land use plans or policies;
- Conflict with existing BLM land use authorizations;
- Change public land disposition; or
- Restrict land tenure adjustments.

4.9.2 Direct and Indirect Effects by Alternatives

This section describes the effects on lands and realty that could result from the implementation of the Project alternatives during construction, operation and maintenance, or decommissioning activities.

4.9.2.1 Alternative A: No Action Alternative

Under this alternative, the BLM would not approve the Applicant's ROW application and would not amend the LVFO RMP, thus, there would be no effect on land use and realty. The BLM would continue to manage the land encompassing the Project area consistent with the existing SRMA as described in the LVFO RMP and an ACEC would not be designated as part of this alternative.

Because there would be no amendment to the LVFO RMP and no solar project approved for the site under this alternative, it is expected that the site would continue to be managed as a SRMA within the BLM's framework of a program of multiple use and sustained yield, and the maintenance of environmental quality in conformance with applicable statutes, regulations, policies, and land use plans. As a result, none of the impacts to land use would occur. In the absence of this Project, other renewable energy projects may be constructed to meet State and Federal mandates, and those projects could have similar impacts in other locations.

4.9.2.2 Alternative B - Applicant's Proposed Project

Effect LANDS-1: Restrict use within the Jean Lake/Roach Lake SRMA.

The Proposed Action (Alternative B) would be constructed entirely on BLM-administered lands within the Jean Lake/Roach Lake SRMA. Alternative B would limit potential public use, including dispersed recreation and OHV use, of approximately 3,881 acres for the duration of the lease. Further discussion of impacts to the Jean/Roach Lake SRMA and OHV routes are located in sections 4.12, *Special Management Areas* and 4.13, *Recreation*.

Alternative B would not result in any impacts to existing or proposed transmission line ROWs that cross the proposed Project footprint, as the Applicant has designed the proposed Project around the existing transmission line ROWs and would allow continued access to the existing transmission lines by their owners. For further analysis of impacts to mineral resources, refer to Section 4.17, Energy and Minerals.

Under Alternative B, the BLM would amend the LVFO RMP to remove the Jean Lake/Roach Lake SRMA designation and change the VRM from Class III to IV within the Project footprint. This would result in a change in the allowable uses within the footprint area as it would no longer be managed as part of the SRMA "for intensive recreation opportunities, including competitive off-road vehicle and other recreational events, as well as dispersed recreational use and commercial opportunities" (BLM 1998). In addition, the change in VRM Class would allow activities which require major modifications of the existing character of the landscape. Each of these would be required to approve the Project, and because they would be limited to the Project footprint would have no impact during the Project lifetime that would not occur anyway from the development of the Project.

4.9.2.3 Alternative C - Alternative Layout

Alternative C would also be constructed entirely on BLM-administered lands within the Jean Lake/Roach Lake SRMA. Impacts under Alternative C would be similar to impacts described for Alternative B and would restrict public use in the Jean Lake/Roach Lake SRMA, however Alternative C would restrict approximately 2,546 acres and be located further south and west within the ROW application area than Alternative B.

4.9.2.4 Alternative D - Modification to Proposed Action Layout

Impacts to lands and realty from the construction and operation of Alternative D would be similar to those described for Alternative B and would restrict public use of Jean Lake/Roach

Lake SRMA, however Alternative D is shifted west and consolidated into more contiguous blocks of development and would restrict approximately 3,110 acres.

Designation of the 30,912-acre ACEC under Alternative D would exclude large site-type ROWs (greater than 5 acres) and be considered a linear ROW avoidance area. Because the ACEC would be managed to protect biological resources, the designation would restrict and/or limit future development within the ACEC. However, ROWs for construction and operation of the SNSA and associated facilities would be allowed in the ACEC, subject to an approved Airport Final Environmental Impact Statement and Record of Decision and subject to compliance with the Endangered Species Act, 16 U.S.C. § § 1531-1544.

4.9.2.5 BLM Preferred Alternative

Impacts to lands and realty from the construction and operation of the BLM Preferred Alternative would be similar to those described for Alternative B, C, and D and would restrict public use of Jean Lake/Roach Lake SRMA, however the BLM Preferred Alternative is shifted west of Alternative B and would restrict less acreage, approximately 2,427 acres. Impacts related to designation of the 31,859-acre ACEC would be as described for Alternative D.

4.9.3 Mitigation Measures

Detailed mitigation requirements and Applicant Proposed Environmental Protection Measures can be found in this document in Section 2.7 Applicant-Proposed Measures and Mitigation Measures, Table 2-3 and Table 2-4. Specific mitigation measures include:

MM LANDS-1. Ensure Compatibility with Airport Projects.

4.9.4 Residual Effects

The removal of the Project footprint from the SRMA classification and the change from VRM Class III to IV would have a residual effect on the allowable land uses within the Project footprint. Uses within the footprint would no longer be limited to those uses currently allowed within the Jean Lake/Roach Lake SRMA.

4.10 SPECIAL MANAGEMENT AREAS

Special Management Areas (SMAs) in the Silver State Solar Project study area are described in *Section 3.10 Special Management Areas* in the 2010 Final EIS and summarized in *Section 3.10* in this document. The CESA for SMAs is described in this document in *Section 4.19 Cumulative Impacts*.

4.10.1 Indicators

An impact to SMAs may result if the Proposed Action were to:

- Restrict public access to the Lucy Gray Mountains, and/or restrict access to public hiking/OHV trails within and across the Jean Lake/Roach Lake SRMA;
- Impact desert tortoise and/or desert tortoise habitat in the Ivanpah DWMA;
- Cause changes in air quality or other air clarity evaluations that could occur within SMAs in the area due to construction and operation activities;
- Conflict with the VRM classifications of the SMAs in the area;
- Cause changes to the darkness of the night sky dome as viewed from SMAs in the area due to construction and operation activities; or
- Cause changes in erosion or sedimentation rates within SMAs in the area.

4.10.2 Direct and Indirect Effects by Alternatives

This section describes the effects on SMAs that could result from the implementation of the Project alternatives during construction, operation and maintenance, or decommissioning activities.

4.10.2.1 Alternative A - No Action

Under this alternative, the BLM would not approve the Applicant's ROW application and would not amend the LVFO RMP; thus, there would be no effect on SMAs. The BLM would continue to manage the land encompassing the Project area consistent with the existing SRMA objective as described in the LVFO RMP and an ACEC would not be designated as part of this alternative.

Because there would be no amendment to the LVFO RMP and no solar project approved for the site under this alternative, it is expected that the site would continue to be managed within the BLM's framework of a program of multiple use and sustained yield, and the maintenance of environmental quality in conformance with applicable statutes, regulations, policies, and land use plans. As a result, impacts to SMAs would not occur.

4.10.2.2 Alternative B - Applicant's Proposed Project

Under Alternative B, the proposed Project would be constructed on approximately 3,881 acres of BLM-administered lands within the Jean Lake/Roach Lake SRMA. The BLM would amend the LVFO RMP to remove the proposed Project footprint from the 216,300-acre Jean Lake/Roach Lake SRMA and change the VRM from Class III to Class IV. This would result in a change in the allowable uses within the footprint area as it would no longer be managed as part of the SRMA "for intensive recreation opportunities, including competitive off-road vehicle and other recreational events, as well as dispersed recreational use and commercial opportunities" (BLM 1998). In addition, the change in VRM Class would allow activities that result in major modifications of the existing character of the landscape.

Effect SMA-1: Restrict public access to the Lucy Gray Mountains, and/or restrict access to the public hiking/OHV trails that cross the Jean Lake/Roach Lake SRMA.

Alternative B would be sited on several trails used for hiking and recreational and competitive OHV races. To allow continued public access to OHV trails in other portions of the SRMA, the

Applicant has committed to allowing dispersed OHV users and other recreationists access to the backcountry and the Lucy Gray Mountains through the Project area (Figure 4.11-1).

The Project would be constructed adjacent to the Ivanpah DWMA, which is positioned immediately south of the Project on the California side of the California/Nevada border. As the Alternative B Project footprint is near the Ivanpah DWMA, the Project could inadvertently introduce noxious weeds into the DWMA from construction equipment unintentionally transporting the seeds of these undesirable plant species. To prevent the spread of noxious weeds, the Applicant would implement a BLM-approved weed management plan to reduce adverse effects to the Ivanpah DWMA.

Effect SMA-2: Cause changes in air quality or other air clarity evaluations that could occur within SMAs in the area due to construction and operation activities.

Construction of Alternative B would not result in air quality or air clarity changes because water would be used for dust suppression as described in *Section 4.1, Air Quality and Climate* and in Table 2.11-2 of this document.

Effect SMA-3: Cause changes to the darkness of the night sky dome as viewed from SMAs in the area due to construction and operation activities.

For operation of Alternative B, security lighting would be employed around certain buildings and access roads. The lighting would be directed at a downward angle and impacts are not expected to nearby Wilderness areas.

Effect SMA-4: Changes in erosion or sedimentation rates with the SMAs in the area.

Under Alternative B, any increased erosion and sedimentation from the Project site would drain to Roach Dry Lake and would not affect the Ivanpah DWMA. For a more detailed discussion of erosion and sedimentation rates, please see *Section 4.5, Water Resources/Hydrology*.

4.10.2.3 Alternative C - Alternative Layout

Under Alternative C, the BLM would amend the LVFO RMP to remove the Jean Lake/Roach Lake SRMA designation from the approximately 2,546-acre Project footprint and change the VRM from Class III to IV. Alternative C would be constructed adjacent to the Ivanpah DWMA, which is positioned immediately south on the California side of the California/Nevada border. As the Alternative C Project footprint would be immediately adjacent to the Ivanpah DWMA, noxious weeds could potentially be introduced into the DWMA from construction equipment unintentionally transporting the seeds of these undesirable plant species. To prevent the spread of noxious weeds, under Alternative C the Applicant would implement a BLM-approved weed management plan to reduce adverse effects to the Ivanpah DWMA. Otherwise, while the footprint of Alternative C is located further south and west within the ROW application area than Alternative B, the impacts described for Alternative B would be similar to Alternative C.

4.10.2.4 Alternative D - Modification to Proposed Action Layout

Alternative D is shifted west and consolidated into more contiguous blocks of development than Alternative B and would affect approximately 3,110 acres. Impacts to SMAs from the construction and operation of Alternative D would be similar to Alternative B.

The 30,912-acre ACEC designated under Alternative D would be within the Jean Lake/Roach Lake SRMA. This area would be managed for biological resource protection and would place additional restrictions on recreational users within the SRMA by restricting development of new roads and trails, and requiring a desert tortoise spotter for permitted non-speed recreation activities in the ACEC during the tortoise active season (approximately March to November). These additional restrictions could further displace OHV riders to areas of the Jean/Roach Lake SRMA outside the ACEC, or to lands outside of the SRMA. It is impossible to predict with any certainty whether the new restrictions would displace OHV riders or the areas to which displaced OHV riders will relocate, however displacement could increase adverse effects to desert tortoises and sensitive plants on other lands.

4.10.2.5 BLM Preferred Alternative

The BLM Preferred Alternative is substantially smaller than Alternative B at 2,427 acres, and the Project footprint would be shifted west and consolidated into more contiguous blocks of development as compared to Alternative B. However, impacts to SMAs from the construction and operation of the BLM Preferred Alternative would be similar to Alternative B or D. The 31,859-acre ACEC designated under the BLM Preferred Alternative would be within the Jean Lake/Roach Lake SRMA and would have similar effects to those described for Alternative D.

4.10.3 Mitigation Measures

No additional mitigation measures are proposed.

4.10.4 Residual Effects

Under Alternatives B, C, D, and the BLM Preferred Alternative the proposed Project footprint would be removed from the Jean Lake/Roach Lake SRMA and the VRM would be changed from a Class III to IV. This would allow the land to be managed for more than the uses currently allowed within the SRMA.

4.11 RECREATION

Recreation in the Silver State Solar Project study area is described in *Section 3.11 Recreation* in the 2010 Final EIS and summarized in *Section 3.11* in this document. The CESA for recreation is described in this document in *Section 4.19 Cumulative Impacts*.

4.11.1 Indicators

An impact to recreation may result if any of the following were to occur from the Proposed Action:

- Conflict with existing Federal, State, or local recreation management plans and policies;
- Change access to existing recreation areas or sites;
- Change levels of use for existing recreation areas or sites; or
- Create substantial overcrowding to other recreation areas caused by “spillover”.

4.11.2 Direct and Indirect Effects by Alternatives

4.11.2.1 Alternative A - No Action

Under this alternative, the BLM would not approve the Applicant’s ROW application and would not amend the LVFO RMP; thus, there would be no impacts to recreational uses or resources. The BLM would continue to manage the land encompassing the Project area consistent with the existing SRMA objective as described in the LVFO RMP and an ACEC would not be designated as part of this alternative.

Because there would be no amendment to the LVFO RMP and no solar project approved for the site under this alternative, it is expected that the site would continue to be managed within the BLM’s framework of a program of multiple use, including recreation, and the maintenance of environmental quality in conformance with applicable statutes, regulations, policies, and land use plans. As a result, impacts to recreational resources would not occur.

4.11.2.2 Alternative B - Applicant’s Proposed Project

Under Alternative B, the proposed Project would be constructed on approximately 3,881 acres located entirely on BLM-administered lands within the Jean Lake/Roach Lake SRMA. Impacts to recreation from the Proposed Action would be similar to those described in *Section 4.11* of the 2010 Final EIS as Alternative B is located within the same general area analyzed in the Final EIS, however is shifted further north and east. These impacts are summarized below and any differences are discussed in detail.

Under Alternative B, the BLM would amend the LVFO RMP for the Project footprint to remove the Jean/Roach Lake SRMA designation and change the VRM Class from a III to a IV. This proposed amendment was not part of the Silver State Solar Project 2010 Final EIS; however, impacts to recreation from the amendment are described below.

Effect REC-1: Conflict with existing Federal, State, and local recreation management plans and policies.

During and after construction, the Project footprint would no longer be available for recreation activities. As noted in *Section 4.11* of the 2010 Final EIS, the Jean Lake/Roach Lake SRMA is managed for intensive recreation opportunities, including competitive off-road vehicle and other

recreational events, as well as dispersed recreational use and commercial activities. The removal of the SRMA designation within the Project footprint would change the policies under which the area is managed as it would no longer be managed as part of the SRMA “for intensive recreation opportunities, including competitive off-road vehicle and other recreational events, as well as dispersed recreational use and commercial opportunities” (BLM 1998).

The BLM is currently revising the 1998 LVFO RMP to establish consolidated guidance and updated objectives and management actions for the public lands in the decision area. This decision area includes the Silver State Solar South Project ROW application area.

Effect REC-2: Changes in access to existing recreation areas or sites.

During and after construction, dispersed recreational activities would not be allowed within the Project footprint, however the Applicant has committed to allowing public access to the Lucy Gray Mountains (see Figure 4.11-1). This access would also be available to organized competitive OHV races, however these events require special recreation permits and separate NEPA documentation before the races are approved. Each race sponsor must submit a permit application with a proposed race course to BLM for review and approval. While portions of past organized competitive event trails within the Project footprint would no longer be available, the Proponent has committed to allowing access to the Lucy Gray Mountains for organized competitive events through the use of their Project access road from the eastern end of the UPRR overpass to the designated maintenance road.

Routes located within the fenced area of the Project footprint would no longer be available for public use. In addition, some routes outside of the Project footprint would be made ineffective if cut off by the footprint. These routes are shown in Figure 4.11-1 and miles of each type of route removed from use by the Project are listed in Table 4.11-1, below:

Table 4.11-1. Recreational Trail Loss Under Alternative B

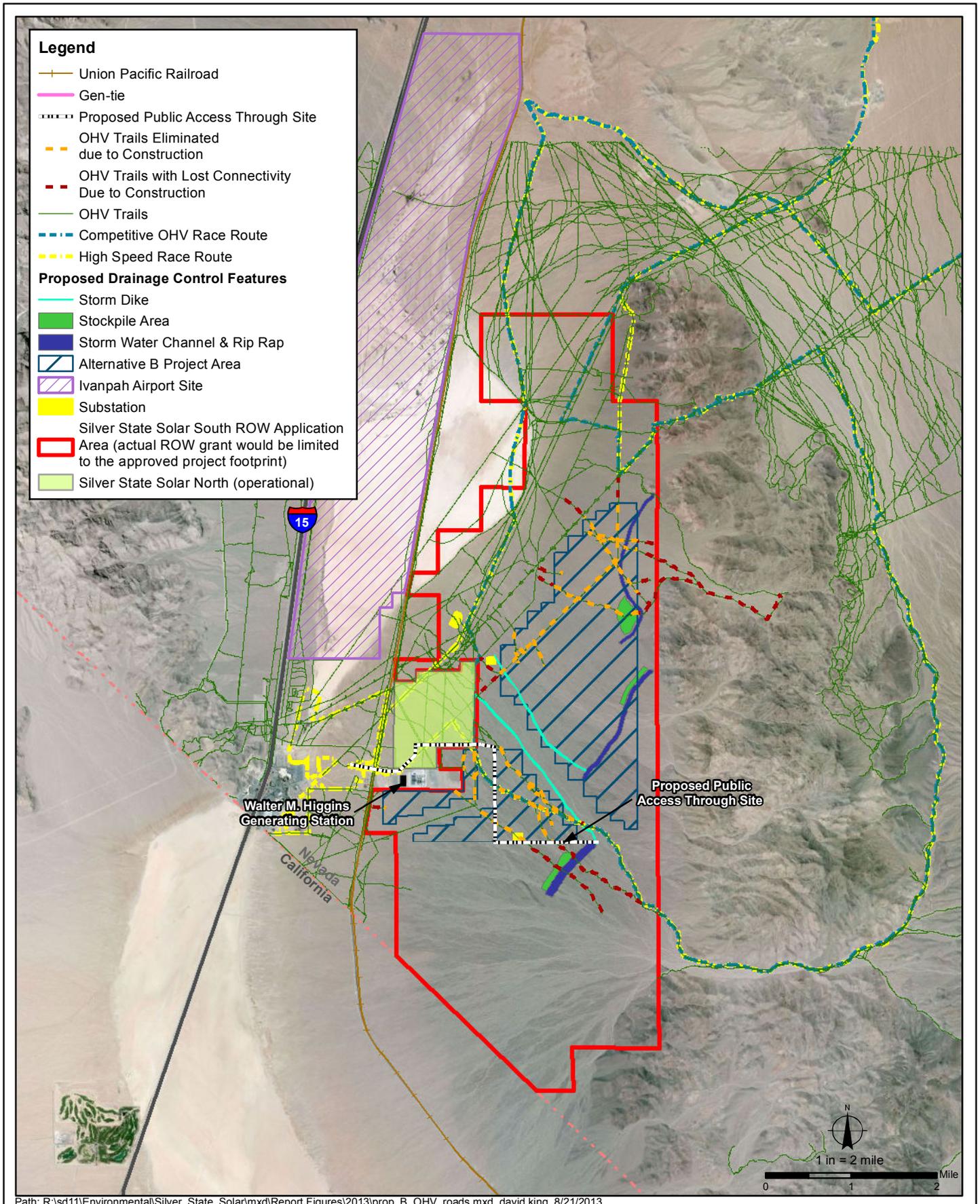
Route Type	Distance lost (miles)
Competitive race route	1.1
Single track, 2-track, OHV	20.4

Effect REC-3: Change in level of use of existing recreation areas or sites.

Alternative B could result in an increase in public use of the remaining portions of the Jean Lake/Roach Lake SRMA. Under Alternative B, the Project footprint would no longer be available for dispersed recreation within the SRMA. Those who may normally recreate in the Project footprint area may relocate to other areas within the Jean Lake/Roach Lake SRMA.

Effect REC-4: Substantial overcrowding caused by “spillover” effects to other recreation areas.

The Project footprint of Alternative B would no longer be accessible by the public for recreation; however, the Project would not prevent casual recreational users from being able to access other areas within the SRMA. The Proponent has committed to allowing access to the Lucy Gray Mountains through the use of their Project access road, located outside of the Project fence.



Recreation Trails Removed by Development of Alternative B
 Silver State Solar South Project

FIGURE
 4.11-1

Therefore, it is not anticipated that construction and operation of the Project would cause substantial spillover to other recreation areas.

4.11.2.3 Alternative C - Alternative Layout

The footprint of Alternative C would be approximately 2,546 acres and located further south and west within the ROW application area than Alternative B. Similar to Alternative B, the Applicant has committed to allowing access to the Lucy Gray Mountains (see Figure 4.11-2); however, dispersed recreation would be restricted within the fenced Project footprint. The public would no longer have access to existing routes within the fenced Project footprint, and those routes which would be cut off by the footprint. These routes are shown in Figure 4.11-2 and miles of each type of route removed from use by the Project are listed in Table 4.11-2, below. Other impacts described under Alternative B, above, would be the same under Alternative C.

Table 4.11-2. Recreational Trail Loss Under Alternative C

Route Type	Distance lost (miles)
Competitive race route	2.9
Single track, 2-track, OHV	7.5

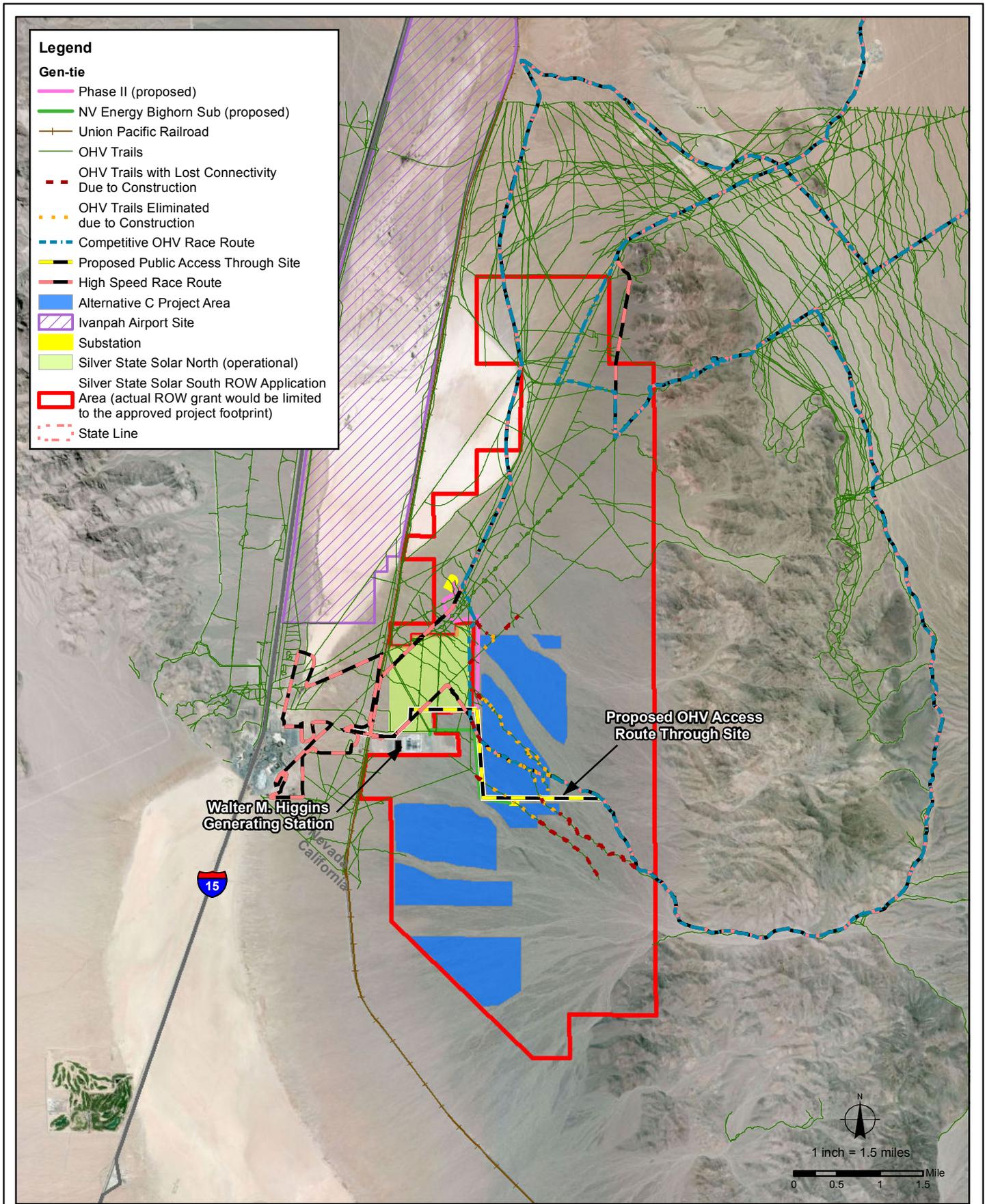
4.11.2.4 Alternative D - Modification to Proposed Action Layout

Alternative D would be approximately 3,110 acres and be shifted west and consolidated into more contiguous blocks of development than Alternative B. The public would no longer have access to existing routes within the fenced Project footprint, and those routes which would be cut off by the footprint. These routes are shown in Figure 4.11-3 and miles of each type of route removed from use by the Project are listed in Table 4.11-3, below.

Table 4.11-3. Recreational Trail Loss Under Alternative D

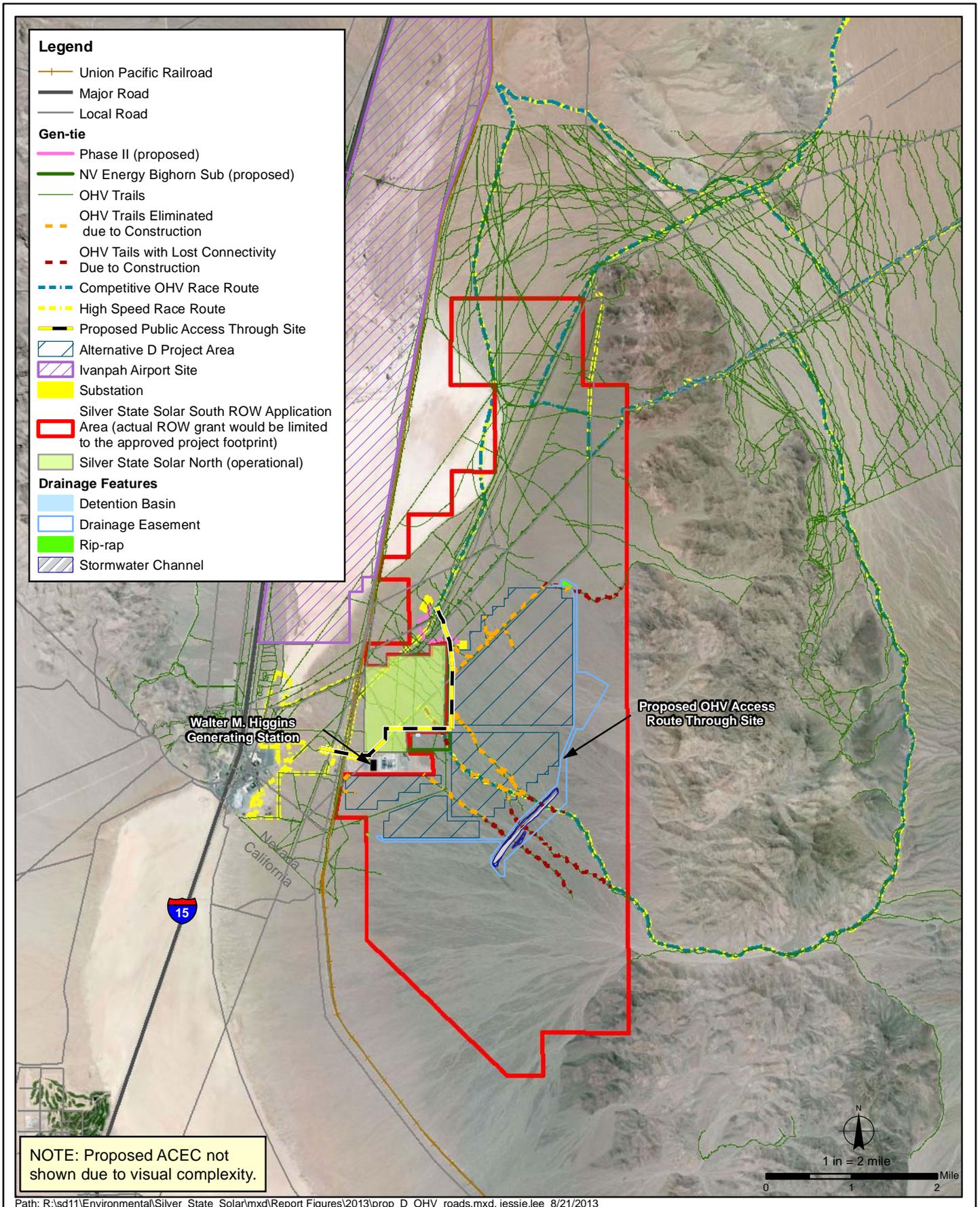
Route Type	Distance lost (miles)
Competitive race route	2.2
Single track, 2-track, OHV	11.2

The 30,912-acre ACEC designated under Alternative D would be within the Jean Lake/Roach Lake SRMA. The area to be designated as an ACEC is currently managed in accordance with the USFWS BO (1-5-98-F-053, June 19 1998) and to minimize impacts to white-margined penstemon. Existing race routes and OHV trails within the ACEC would be allowed to remain and maintenance of these trails would be allowed provided the trails are not widened beyond their condition at the time of ACEC establishment (refer to Table 2-2). Additional restrictions would be placed on recreation users by potentially making development of new roads and trails more difficult, and requiring a desert tortoise spotter for permitted non-speed recreation activities in the ACEC during the active tortoise season (approximately March to November). These additional restrictions could further displace OHV riders to areas of the Jean Lake/Roach Lake SRMA which is not part of the ACEC, or to lands outside of the SRMA. It is impossible to



Recreation Trails Removed by Development of Alternative C Silver State Solar South Project

FIGURE 4.11-2



Path: R:\sd11\Environmental\Silver_State_Solar\mxd\Report Figures\2013\prop_D_OHV_roads.mxd, jessie.lee 8/21/2013

Recreation Trails Removed by Development of Alternative D Silver State Solar South Project

FIGURE 4.11-3

predict with any certainty the areas to which displaced OHV riders will relocate, however this displacement could increase adverse effects to desert tortoises and sensitive plants on other lands. Other impacts to recreation from Alternative D would be similar to those described for Alternative B above.

4.11.2.5 BLM Preferred Alternative

The BLM Preferred Alternative would involve development on approximately 2,427 acres, and the Project footprint would be shifted west as compared to Alternative B. As with all of the action alternatives, routes within the fenced Project footprint would be cut off and no longer be available for public access. Total miles of each type of route removed from use by the Project are listed in Table 4.11-4, below.

Table 4.11-4. Recreational Trail Loss Under BLM Preferred Alternative

<u>Route Type</u>	<u>Distance lost (miles)</u>
<u>Competitive race route</u>	<u>2.0</u>
<u>Single track, 2-track, OHV</u>	<u>12.9</u>

Impacts related to designation of the 31,859-acre ACEC would be as described for Alternative D. Other impacts to recreation from the BLM Preferred Alternative would be similar to those described for Alternative B above.

4.11.3 Mitigation Measures

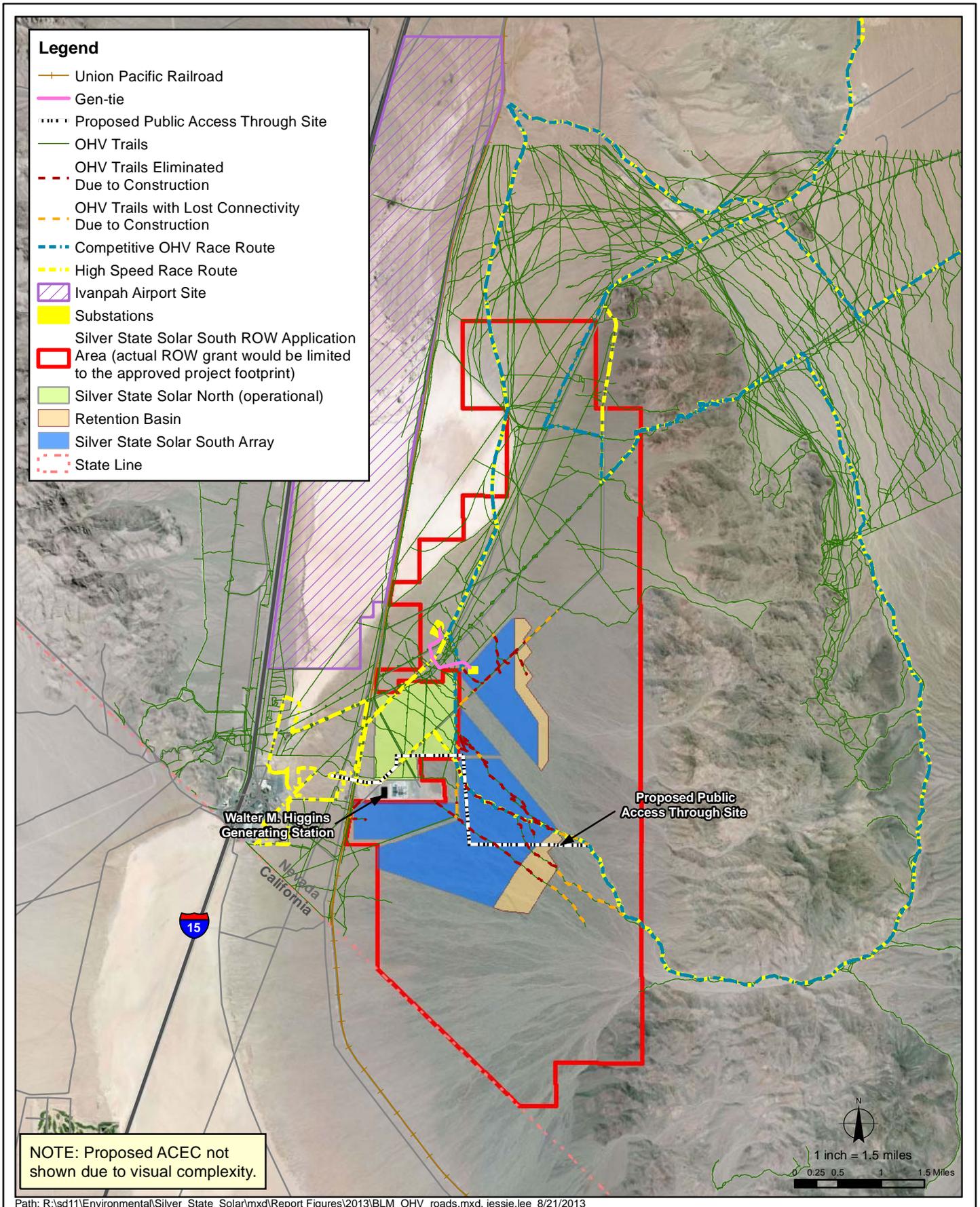
Detailed mitigation requirements and Applicant Proposed Environmental Protection Measures can be found in this document in *Section 2.7 Applicant-Proposed Measures and Mitigation Measures*, Table 2-3 and Table 2-4. Specific mitigation measures include:

MM REC-1: Signage Plan for Trail Identification.

MM REC-2: Public Use of Project Access Road Outside of the Perimeter Fence.

4.11.4 Residual Effects

Off road and other recreational activities would continue to be allowed, but their existing routes would be disrupted to varying degrees due to loss of access to the Project area. However, organized OHV races and dispersed OHV users would be allowed to use the access road through the Project site, minimizing disruption.



Recreation Trails Removed by Development of BLM Preferred Alternative Silver State Solar South Project

FIGURE 4.11-4

4.12 VISUAL RESOURCES

The visual impact assessment was based on the BLM VRM System 8400 series and tiers off *Section 4.12* in the 2010 Final EIS. Impacts of the proposed Project were assessed by determining the levels of contrast introduced to the scenic quality, sensitivity levels, and distance zones (the elements of the VRI), by considering the distance and visibility of Project components to KOPs, and by determining conformance to the VRM objectives. Visual impacts are described in terms of initial and residual impacts. *Initial impacts* are those impacts that would result from the implementation of the proposed Project and any APMs or design features as required by the BLM, and as designed by the Proponent; *residual impacts* are subsequently identified after site-specific (selective mitigation) measures have been developed to specifically address mitigable initial impacts, and are the focus of the visual impact assessment as described below.

4.12.1 Indicators

Adverse effects on visual resources would occur if the Proposed Action would:

- Introduce visual contrast into the environment that would alter the VRI classification, Scenic Quality rating, Sensitivity Level rating or adjust the Distance Zones;
- Result in moderate to strong detectable visual contrast as observed from identified KOPs; or
- Create visual contrasts which exceed the VRM class objectives in the RMP.

4.12.2 Impact Assessment Methodology

4.12.2.1 Contrast

Contrast is defined as the degree of visual change that occurs in the landscape, due to the construction and operation of a proposed facility. Visual contrast typically results from (1) landform modifications that are necessary to prepare a facility for construction, (2) removal of vegetation to construct a facility, and (3) the introduction of facilities (structures, lighting, and glint and glare [in the case of PV solar technology]) into the landscape. The visual contrast assessment is performed by comparing visual elements (form, line, color, and texture) of the existing landscape, which are identified and documented during field investigations, with the visual elements associated with a proposed project. For this Project, the visual contrast assessment was recorded in using BLM Visual Resource Contrast Rating Worksheets (Form 8400-4). Existing landform, vegetation, and structural components of the landscape were evaluated in conjunction with the proposed Project and assigned degrees of contrast, defined as follows:

- *Strong* – contrast demands attention and strongly dominates the landscape
- *Moderate/Strong* – contrast begins to demand attention and is still moderately dominant in the landscape
- *Moderate* – contrast attracts attention, but is co-dominant in the landscape

- *Weak/Moderate* – contrast begins to attract attention and is moderately subordinate in the landscape
- *Weak* – contrast can be seen, but is subordinate in the landscape

Construction of the proposed Project would require the removal of vegetation and grading to install the facilities. Vegetation would be cleared within the facility footprint including necessary access roads and fire breaks around the perimeter. Localized grading would include filling in of small drainages and depressions for the Project area and unpaved access roads resulting in low visual change to landform. A strong level of visual change is anticipated for the PV panel arrays, as strong structural elements would be introduced into a largely flat and gently sloping landscape setting. The scale of the proposed Project is much larger than the existing Silver State Solar North facilities and contributes to the strong contrast rating. In addition to scale, the regular geometric forms and strong horizontal lines associated with the PV panel arrays would contrast strongly with the irregular, organic forms of the existing landscape, vegetation, and surrounding terrain. The panel arrays would appear dark gray in color, strongly contrasting with the surrounding landscape, which is predominately green (vegetation), with occasional patches of tan or brown (soils and/or unpaved roads).

As outlined in Chapter 2 of this document, facilities common to each alternative include solar field and ancillary facilities, including internal circulation roads maintenance roads, and associated firebreaks. Other facilities include the substation, switchyard, and high-voltage transmission and collection line facilities. Detention basins and associated drainage channels may be located outside of the perimeter fence.

The majority of the anticipated visual contrast associated with the proposed Project would range from moderate to strong, because the Project would:

- occur near existing modifications in the landscape (e.g., solar facilities, transmission lines, and other development or industrial facilities);
- occur primarily on lands with minimal slope/topographic variation; and
- occur near regularly spaced vegetation that is medium in height.

In addition to levels of visual contrast associated with facilities, operation of the solar facility would require temporary nighttime lighting for construction. Permanent lighting would be similar to the Silver State Solar North Project (see *Section 2.5.10* of the 2010 Final EIS).

In general, the use of PV panels would produce glint and glare that could be visible to the public, increasing contrast for all KOP viewsheds; however, this increase would be intermittent or limited to certain times of the day. For KOPs with level views of PV facilities (e.g., KOPs 3 and 4), glint and glare associated with movement times would be generally limited to the first visible row of solar panels. KOPs with superior views of the Project (e.g., KOPs 6 and 10) may be affected by glint and glare throughout the day, because larger portions of the Project would be visible. In addition to viewer elevation, contrast associated with glint and glare is anticipated to decrease as distance between the Project and KOP increases (e.g., KOPs 8). PV panels would be significantly less reflective because the surfaces would be designed to specifically not reflect light, thus reducing the potential for glint and glare. Overall, when compared to other types of solar panel technology such as Concentrating Solar Thermal or Power Tower facilities, the PV

panels would minimize the potential for glint and glare because of the less reflective panel surfaces.

4.12.2.2 Visual Resource Inventory

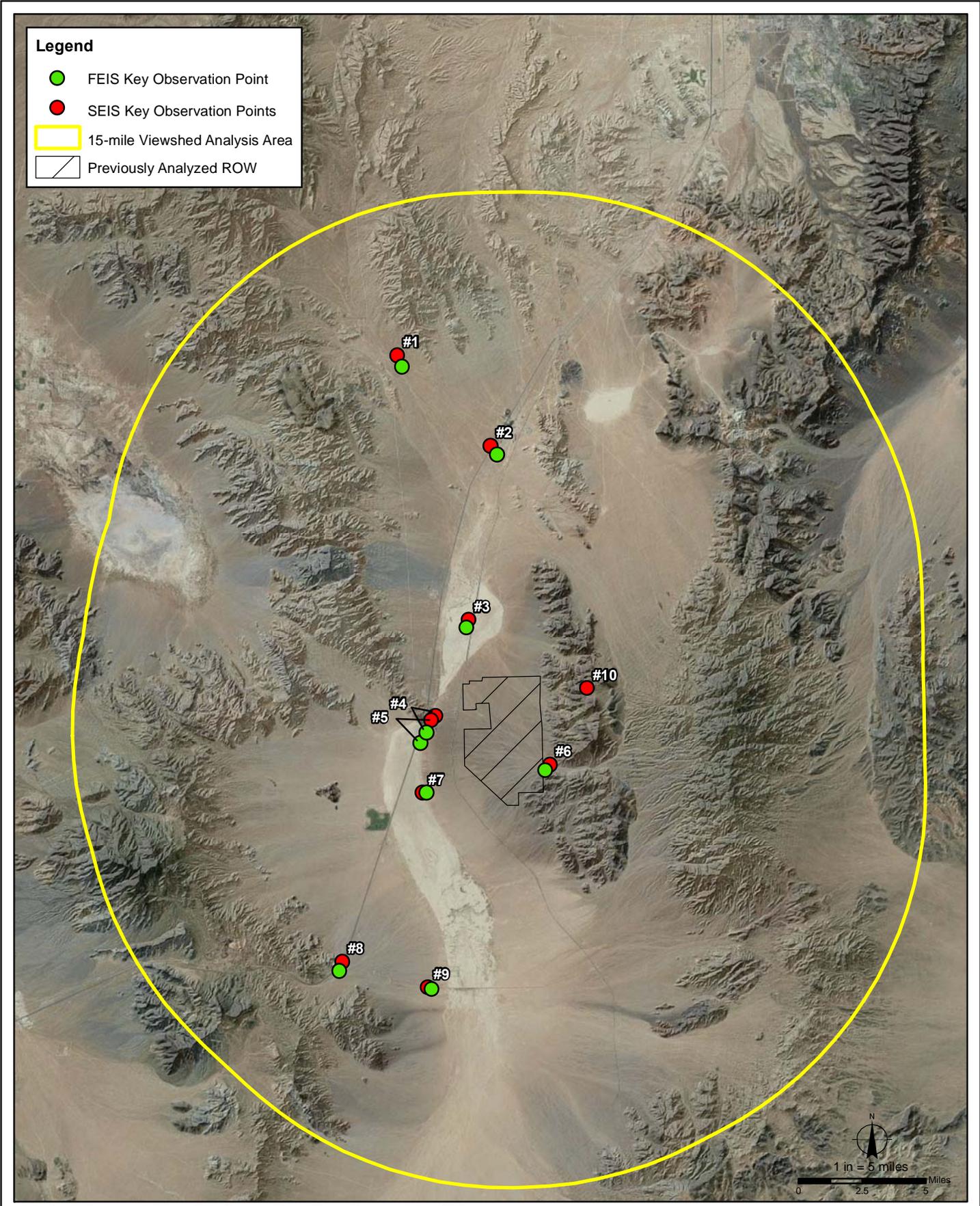
The VRI process and its resulting information not only provide the information necessary to characterize the existing or affected environment, but are required for management and project-level decisions (see Appendix A-1 in this document for BLM worksheets). The existing VRI classifications data provides a basis of analysis for the Project site, which is wholly contained upon BLM-administered public lands (as described in *Chapter 3.12* of this document and shown on Figures 3.12.1-3.12.6). Each component of the VRI data was evaluated to determine the level of visual contrast that would occur from the proposed Project. The inherent contrast to scenic quality was assessed to determine if the Project would substantially detract from scenic quality. The degree of contrast to existing sensitivity was evaluated to determine if the Project would reduce the sensitivity level. Effects to distance zones were identified through the assessment of KOPs and, depending on the location of the Project and its associated contrast within the mapped distance zone, a determination was made regarding how the zones would be affected by the Project. The visual value (i.e., Class I, II, III, IV; Scenic Quality A, B, C; Sensitivity High, Medium, Low, etc.) of the Project area was assessed to determine if the Project would change any of the existing baseline inventory ratings and VRI Class results. *The percentage of the VRI affected by the proposed Project and the methodology used to assess impacts is provided in Appendix A-2 in the back of this document.*

4.12.2.3 Key Observation Points

Impacts to KOPs (sensitive viewers) were determined by considering the degree of contrast and each of the ten factors listed in the BLM Handbook (H-8431-1 Visual Resource Contrast Rating). For this Project, the following factors were identified as key considerations for the impact assessment (1) distance relationship of the KOPs to the proposed Project, (2) and the visibility of the components (angle of observation, duration of view, relative scale) as described in *Section 2.0 Alternatives and Proposed Federal Actions* in this document (Visual Contrast Rating Worksheets *are provided in Appendix A-3 in this document.* Photographic simulations were prepared for 7 of the 10 KOPs (the selection process is consistent with the method described in the 2010 Final EIS), to depict potential impacts and to illustrate the effectiveness of mitigation at selected sites (see Appendix A-4 in this document). For each alternative, *the KOP locations evaluated in the* 2010 Final EIS and KOP locations *analyzed in the Supplemental EIS/PRMPA* are depicted on Figures 4.12.1-4.12.4 on the following pages.

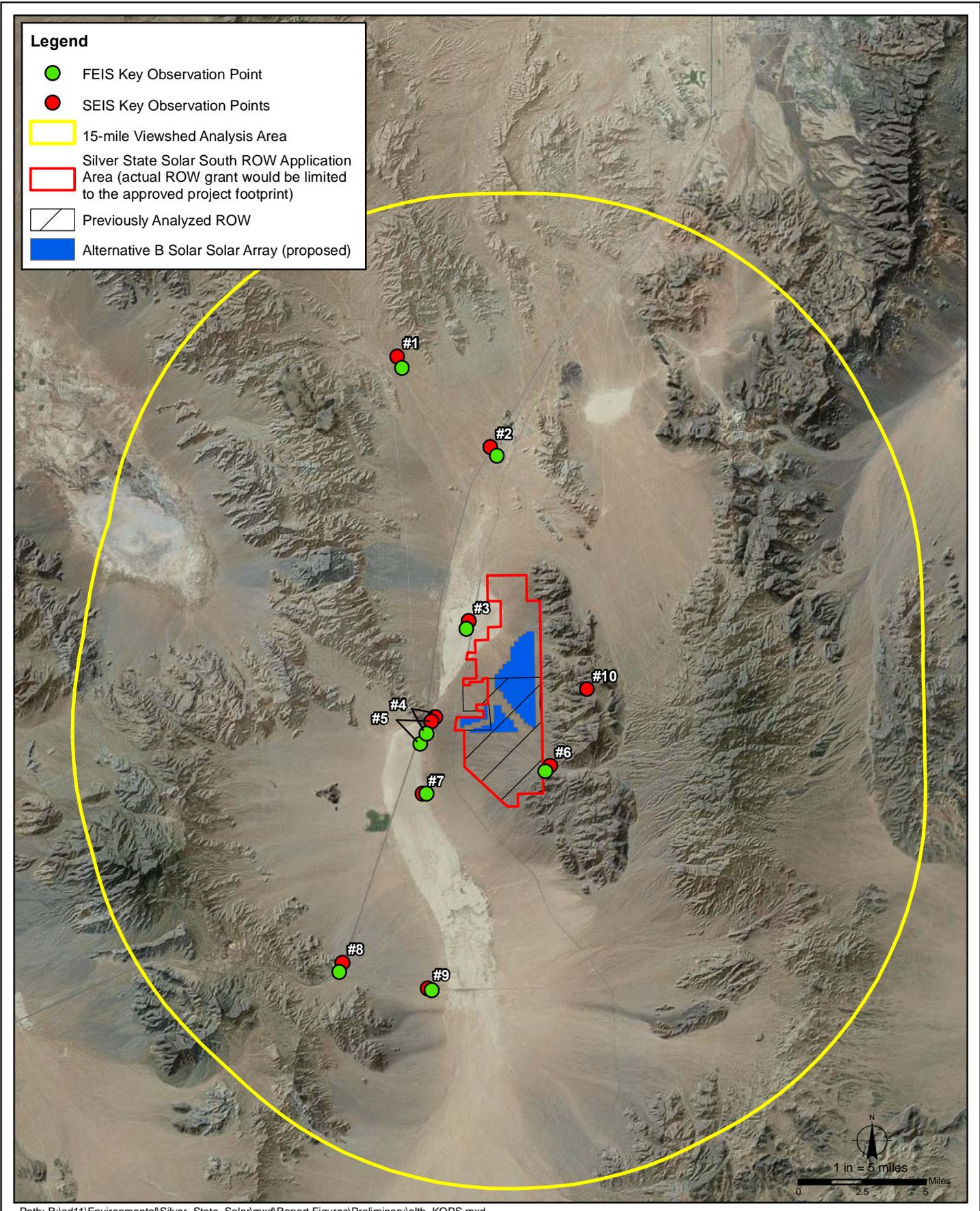
4.12.2.4 Compliance with Visual Resource Management Classifications

Per the BLM policy, compliance with VRM objectives was determined using the contrast rating process and approved KOPs (see Appendix A-3 in this document).



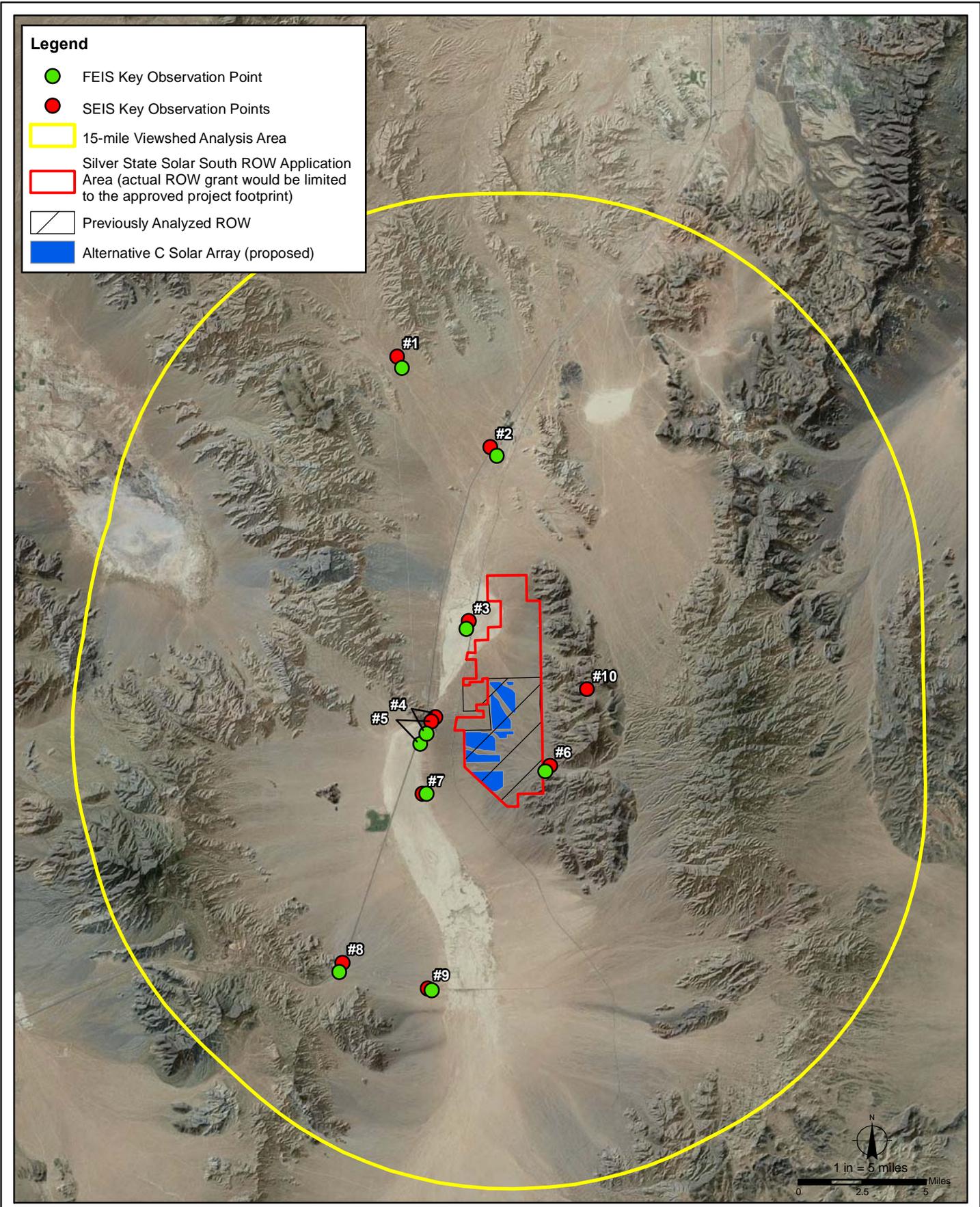
**FEIS and SEIS Key Observation Points – Alternative A
Silver State Solar South Project**

**FIGURE
4.12-1**



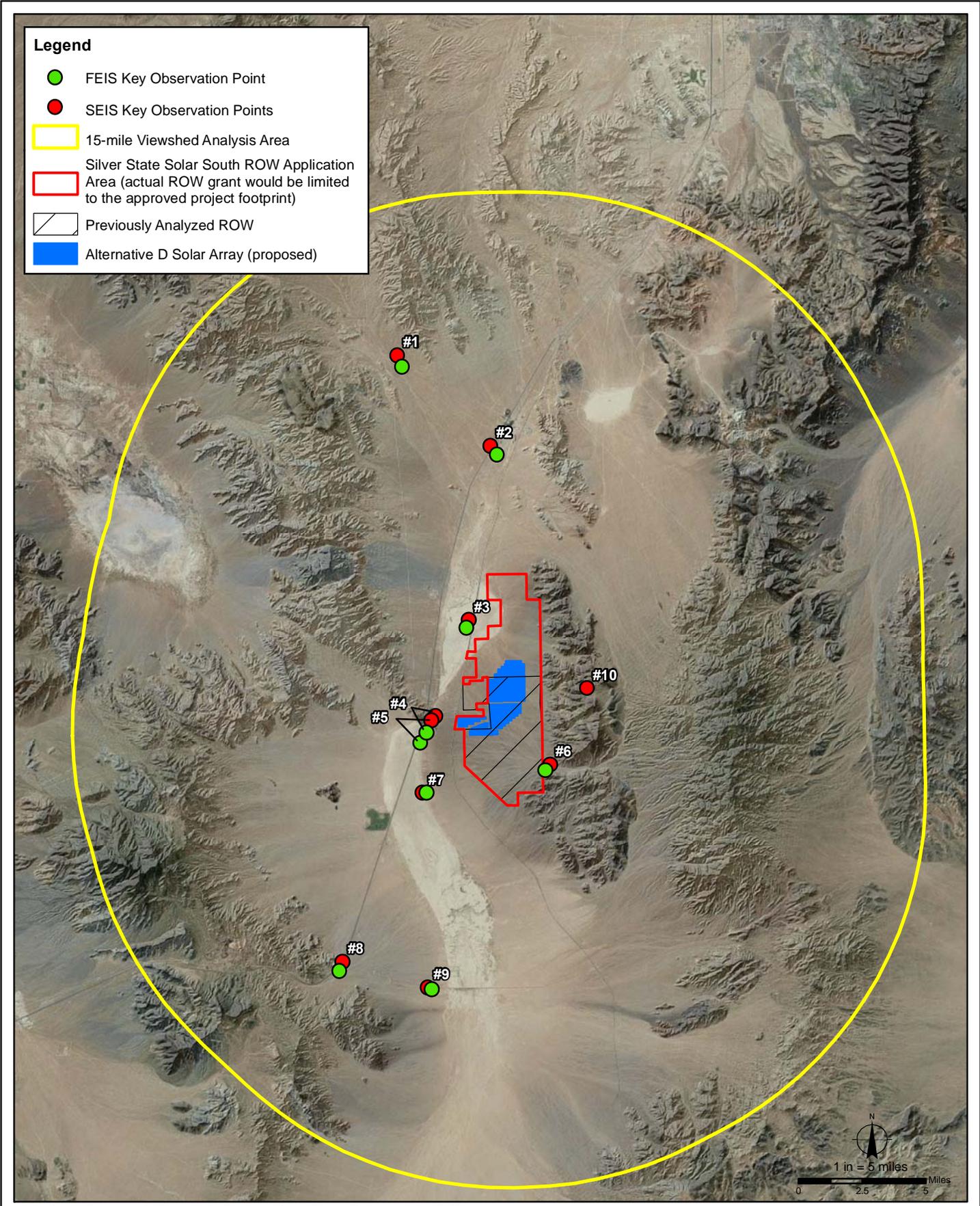
**FEIS and SEIS Key Observation Points – Alternative B
Silver State Solar South Project**

**FIGURE
4.12-2**



**FEIS and SEIS Key Observation Points – Alternative C
Silver State Solar South Project**

**FIGURE
4.12-3**



**FEIS and SEIS Key Observation Points – Alternative D
Silver State Solar South Project**

**FIGURE
4.12-4**

4.12.2.6 Conformance with Applicable RMPs

Per the BLM VRM system (BLM Handbook H-8431-1), an assessment of all major proposed surface-disturbing activities or developments, such as the proposed Project, must be conducted in order to evaluate compliance with VRM objectives designated in applicable RMPs for BLM administered lands. Conformance, or lack thereof, with relevant RMPs was determined by assessing visual contrast in context with VRM objectives.

4.12.3 Direct and Indirect Effects by Alternatives

4.12.3.1 Alternative A – No Project Alternative

Under the No Action Alternative there would be no construction or operation of the Project *and the VRM classification would not be changed*; therefore, there would be no impacts to visual resources resulting from Project-related activities. No mitigation measures are proposed and no residual effects are anticipated.

4.12.3.2 Alternative B - Applicant's Proposed Project

Effect VIS-1: Short-term change to visual resources

Short-term changes to visual resources from the Project would be associated with construction activities. During construction, short-term impacts would include activities that occur only during construction such as use of signage, construction-related night lighting, disturbance associated with temporary construction areas and/or access roads, and associated construction vehicles and equipment. These activities would affect VRI and would be noticeable from all KOPs described below. The most notable effect during construction would be the geometric forms and color contrast associated with the exposed soils created within the Project footprint. Temporary disturbance associated with grading berms and detention basins would be blended into the natural landscape to the extent practicable. These temporary disturbance areas would be revegetated to reduce visual contrast.

Effect VIS-2: Long-term change to visual resources

As outlined in *Section 4.12.2* of this document (*Impact Assessment Techniques*), this effect discusses the visual resource impacts of the Project to VRI, KOPs, and conformance with VRM objectives. Long-term change to visual resources would result from the installation and operation of solar PV equipment, switchyards, transmission lines *and towers*, berms, access roads, detention basins, perimeter fire break, external fencing, and Project lighting. Impacts on visual resources are assessed below and include a mitigation measure to reduce visual contrast (**MM VIS-1**).

VRI (Scenic Quality, Sensitivity Levels, and Distance Zones)

The Project would occur within Class C scenery associated with Ivanpah Valley (Unit Number 22), a broad flat valley with three dry lake features surrounded by mountain ranges that create an enclosed landscape. Impacts to scenic quality are anticipated to be moderate because visual

contrast would be moderate, due to existing developed settings that include PV solar facilities, multiple *high-voltage* transmission lines *and towers*, a power generation facility, and OHV activities that modify the landscape setting. Overall, the scenic quality rating unit would remain Class C; however, the cultural modifications factor rating would be lowered due to existing industrial facilities which modify the landscape (see Appendix A-2 in this document). From a planning scale perspective, the Project would affect approximately 2.6 percent of this Class C rating (Unit Number 22); therefore, the Project would result in a low impact to the existing landscape character. Impacts to Class A or Class B scenery are not anticipated for the proposed Project.

The majority of the Project area would occupy lands associated with low sensitivity (Unit Number 61). An isolated portion of Alternative B (*approximately 470 acres*), directly south of Silver State North, would cross lands associated with moderate sensitivity near I-15 (Unit Number 24); however, this area has been modified by transmission lines and development. The overall rating for sensitivity level rating Unit Number 61 and Unit Number 24 would remain the same. The Project would affect approximately 9.7 percent of low sensitivity level rating unit and 0.9 percent of moderate sensitivity level rating units. The Project would result in minimal impacts to these sensitivity level rating units. The entire Project area would be located on lands associated with the foreground-middleground distance zone and VRI Class IV. Overall the rating for sensitivity levels, distance zones, and VRI classes would not be affected by this alternative, because the local setting has been modified by existing developed facilities with similar form, line, color, and texture. The addition of the proposed Project to this modified setting would not affect these components of the VRI; therefore, existing VRI classes are not expected to be impacted.

Key Observation Points and Compliance with VRM Classifications

KOP 1 – View from Goodsprings Road – Visual contrast is anticipated to be weak/moderate for travel route viewers along Goodsprings Road, because the Project would be moderately subordinate in the landscape when viewed in the background distance zone (approximately 12 miles) while traveling southeast along this KOP. At this distance, the Project’s solar collector fields would be visible as flat, geometric forms while the other Project components would be less visible (see Appendix A-4 for simulation). Ivanpah valley is a long, broad valley that is primarily panoramic but slightly enclosed by adjacent mountain ranges. The relative scale of the Project would be subordinate in this landscape due to lack of enclosure. In addition, the Project may be visible for several minutes from a slightly superior view; however, impacts are anticipated to be low for this KOP because the Project would not dominate the landscape. The Project would be compliant with VRM Class III objectives.

KOP 2 – View from I-15 near Jean – Impacts are anticipated to be low for travel route viewers along I-15. Weak/moderate contrast is anticipated within the background distance zone (approximately 8 miles from this viewpoint) when traveling along this KOP. The Project would be viewed in context with the existing Silver State North facility, *high-voltage* transmission lines, and other industrial facilities with similar form, line, and color (*simulations are provided in Appendix A-4 in this document*). In addition, travel route viewers are typically viewing the landscape at a high rate of speed; therefore, the Project would be visible for several minutes although the Project would not be within the driver’s primary field of vision. Similar to KOP 1,

the relative scale of the Project would be subordinate in this valley landscape due to lack of enclosure. The Project would be in conformance with the proposed VRM Class III objectives.

KOP 3 – View from Roach Lake – Visual contrast is anticipated to be moderate for recreation viewers at Roach Lake. This level of contrast would be visible to OHV users; however, the landscape would not be the primary focus while recreating off-road. Viewing duration for recreation viewers would depend on the length of time recreating and could last for several hours. Conversely, campers at the lakebed would have a longer viewing duration (daily to weekly) of the landscape where the moderate Project contrast would be viewed within the foreground-middleground distance zone (approximately 2 miles). From this viewpoint, the existing transmission lines and the Walter M. Higgins Power Generation Station are visible in the foreground, dominating the view (see Appendix A-4 for simulation). In addition, visitors/campers would have level views of the Project, and existing vegetation may help to partially screen views of the Project area. When viewed in context with these industrial modifications, the relative scale of the Project would be co-dominant in the landscape, resulting in low to moderate impacts for recreational visitors at this viewpoint. Project views from this KOP would be in conformance with the VRM Class III objectives.

KOP 4 – View from Desert Oasis Apartment Complex – Residences would have level to slightly superior views of the Project located in the foreground-middleground distance zone (approximately 1 to 3 miles). Residences would have a longer viewing duration of the landscape (every day throughout the year) where moderate visual contrast would be evident because portions of the entire facility would be visible. It should be noted however, that the Project would be viewed in context with existing modifications such as the Silver State North facility and Walter M. Higgins Power Generation Station (see Appendix A-4 for simulation). A high-voltage transmission line is adjacent to the apartment complex, and others are visible in the foreground. When viewed in context with these industrial modifications, the relative scale of the Project would be co-dominant in the landscape, resulting in moderate impacts to residential viewers. Although the Project would result in moderate contrast from this KOP, it would be in conformance with VRM Class III objectives.

KOP 5 – View from Primm Valley Resort and Casino – Similar to KOP 4, impacts are anticipated to be moderate for viewers. The Project would be visible in the foreground-middleground distance zone (approximately 1 to 3 miles) and viewed in context with existing industrial modifications. Guests and workers at the resort and casino would have a longer viewing duration (daily to weekly) as well as level to superior views of the Project from this KOP. Due to the modifications in the immediate foreground, the relative scale of the Project would be co-dominant in the landscape, resulting in moderate visual contrast, which would be in conformance with VRM Class III objectives.

KOP 6 – View from Lucy Gray OHV Trail – Recreation users along this OHV trail would have slightly superior views of the Project area in the foreground/middleground distance zone (approximately 2 miles). Strong visual contrast would occur, because the relative scale of the Project would be dominant in the landscape although it would be viewed in context with existing modifications within Ivanpah Valley (see Appendix A-4 for simulation). Development associated with the town of Primm, Silver State North, and the Walter M. Higgins Power Generation Station is evident in the middleground. OHV recreation users along the Lucy Gray OHV Trail may not focus on views of landscape while recreating off-road; however, their

viewing duration may last several hours while on the trail. In addition, vegetation and topography may partially screen portions of the Project area and other landform/vegetation modifications; however, initial impacts are anticipated to be high. Residual impacts would be reduced to moderate/high through the implementation of selective mitigation measures. If economically feasible, a surface treatment would be used for all areas with exposed soil within the Project footprint including firebreaks and access roads. Although this mitigation measure would reduce visual contrast, the Project would not be in conformance with the RMP's VRM Class III designation because the Project would dominate the setting from this KOP.

KOP 7 – View from Ivanpah Lake – This location is another OHV recreation destination where the Project would be visible in the foreground-middleground distance zone (approximately 3 miles). Although recreation viewers are anticipated to focus more on OHV activities than on viewing the landscape, their viewing duration could last several hours. Recreation viewers would have level views of moderate visual contrast which would be minimally screened by topography and vegetation. Modifications associated with existing high-voltage transmission lines, the Walter M. Higgins Power Generation Station, and existing Silver State North facility are visible but do not dominate the setting from this KOP. As a result, impacts are anticipated to be moderate because the scale of the Project would be co-dominant in the landscape and screening would be minimal; however, Project views from this KOP would be in conformance with the VRM Class III objectives.

KOP 8 – View from I-15 at Nipton Road Overpass – Visual contrast is anticipated to be weak/moderate for travel route viewers along I-15, because the Project would be less than co-dominant when viewed in the background distance zone (approximately 10 miles). In addition, travel route viewers along I-15 are typically viewing the landscape at a high rate of speed; therefore, Project would be visible for several minutes. The relative scale of the Project would be subordinate in this valley landscape due to lack of enclosure. Although the Project area would be visible from this superior view, impacts are anticipated to be low because Project features would have less contrast due to distance and the presence of the dry lake bed that dominates the landscape (see Appendix A-4 for simulation). Project views from this KOP would be in conformance with the VRM Class III objectives.

KOP 9 – View from Entrance to Mojave National Preserve – This KOP is a recreation destination location for visitors to the Mojave National Preserve. Viewing duration would be short, lasting a few minutes for visitors when leaving the preserve. Similar to KOP 8, impacts are anticipated to be low for viewers seeing weak to moderate visual contrast. The Project would be visible in the background distance zone (approximately 10 miles) in a setting with limited modifications. The relative scale of the Project would be subordinate in this valley landscape setting. The Project has a relatively low profile and vegetation and landform may partially screen the views of the Project from this KOP. Project views from this KOP would be in conformance with the VRM Class III objectives.

KOP 10 – Lookout by Communications Tower – An unpaved maintenance road provides access to a communications tower site atop the Lucy Gray Mountains. OHV recreation users access this overlook point as part of a local tour operation; however, viewer expectation and sensitivity may be moderate due to the existing communication facilities at the overlook. Viewing duration may last several minutes or longer depending on the recreation activity (turn-around point or overlook stop) The existing setting is primarily developed with I-15, the town of Primm, several

transmission lines, Walter M. Higgins Power Generation Station, and Silver State North facility visible from this superior KOP (see Appendix A-4 for simulation). The foreground/middleground distance zone (approximately 2 miles) would be dominated by the proposed Project (generally for all alternatives, although the footprint layout varies slightly). The introduction of the proposed Project would replicate the existing form, line, color, and texture of the Silver State North project, although a strong level of visual contrast would result due to the scale of the proposed Project. Initial impacts are anticipated to be high; however, residual impacts could be reduced to moderate/high through the implementation of selective mitigation measures. If economically feasible, a surface treatment will be used for all areas with exposed soil within the Project footprint including firebreaks and access roads. In addition, the design of the fire break edge will be determined by BLM in conjunction with the Project engineer. The goal of this mitigation is to soften the edge of the Project footprint borrowing from the form/line of the playa and other natural landscape features that characterize the existing setting. This mitigation should not result in additional Project disturbance. Although selective mitigation measures would reduce visual contrast, the proposed Project would not be in conformance with the site's existing VRM Class III objectives because the Project would dominate the landscape setting from this KOP.

Summary of VRM Conformance

Conformance to the existing VRM Class III objectives is anticipated for eight of ten KOPs assessed because the level of visual contrast would be weak/moderate to moderate and the Project would not dominate the setting from these viewpoints (Table 4.12-1). Through the implementation of selective mitigation measures, KOP 6 and KOP 10 would have views of moderate/strong visual contrast and the Project would dominate the setting from these superior viewpoints within the foreground/middleground distance zone. The following table summarizes compliance with VRM Classifications by identified KOPs.

4.12.3.3 Alternative C - Alternative Layout

VRI (Scenic Quality, Sensitivity Levels, and Distance Zones)

Approximately 473 acres of the Project area for Alternative C would occur on lands associated with moderate sensitivity near I-15. The remaining 2,073 acres would occur on low sensitivity lands. A small portion of this alternative would occur with the seldom seen distance zone (Figure 3.12-4). Although the specific Project footprint differs slightly from Alternative B, impacts to scenic quality, sensitivity levels, and distance zones would be similar.

Key Observation Points

Generally, Alternative C would result in impacts to the KOPs similar to Alternative B. Although the footprint is roughly the same size as Alternative B, Alternative C would be located south of the existing Silver State North facility; thus viewing distance would vary slightly. The viewing distance between the Project and KOP would increase by 2 miles for northern KOPs 1 and 2. KOPs immediately adjacent to the Project on the east and west side (3, 4, 5, 6, and 10) would have similar impacts as Alternative B, because viewing distance would be similar. The viewing distance for KOPs to the south (7, 8, and 9) would decrease by at least 1 mile when compared to Alternative B.

Table 4.12-1. Compliance with VRM Classifications by KOP

KOP	User Type	Viewing Duration (<i>expected time a viewer would see the Project</i>)	Viewer Elevation	Sensitivity (<i>Project level</i>)	Distance Zone	VRIC	VRM Conformance III
KOP 1 - Goodsprings Road	Travel Route	Short	Superior	Moderate	Background	IV	Yes
KOP 2 - I-15 near Jean	Travel Route	Short	Superior	Moderate	Background	IV	Yes
KOP 3 - Roach Dry Lakebed	Recreation	Moderate	Level	Moderate	Foreground/ Middleground	IV	Yes
KOP 4 - Desert Oasis Apartment Complex	Residential	High	Level	High	Foreground/ Middleground	IV	Yes
KOP 5 - Primm Valley Resort and Casino	Recreation	Moderate	Level, Superior	Moderate	Foreground/ Middleground	IV	Yes
KOP 6 - Lucy Gray OHV Trail	Recreation	Moderate	Superior	Moderate	Foreground/ Middleground	IV	No
KOP 7 - Ivanpah Dry Lakebed	Recreation	Moderate	Level	Moderate	Foreground/ Middleground	IV	Yes
KOP 8 - I-15 at Nipton Road Overpass	Travel Route	Short	Superior	Moderate	Background	IV	Yes
KOP 9 - Entrance to Mojave National Preserve	Recreation	Moderate	Level	High	Background	IV	Yes
KOP 10 - Lookout from Communications Tower	Recreation	Moderate	Superior	Moderate	Foreground/ Middleground	IV	No

4.12.3.4 Alternative D - Modification to Proposed Action Layout

VRIC (Scenic Quality, Sensitivity Levels, and Distance Zones)

Impacts to scenic quality, sensitivity levels, distance zones, and VRIC Classes would be similar to Alternative B. *Approximately 464 acres of Alternative D would occur on lands associated with moderate sensitivity near I-15. The remaining 2,646 acres would occur on low sensitivity lands.* Alternative D includes a proposed 30,912-acre ACEC, as described in Section 2.3.4 in this document. Because *the ACEC designation would not change* visual management prescriptions, *it*

would not result in substantial impacts to VRI. Restriction of large site-type ROWs and other development and activities would be expected to lead to less future change to VRI in the ACEC and ensure compliance with the VRM Class III lands in the Project study area. *However, ROWs for construction and operation of the SNSA and associated facilities would be allowed in the ACEC, subject to an approved Airport Final Environmental Impact Statement and Record of Decision and subject to compliance with the Endangered Species Act, 16 U.S.C. §§ 1531-1544.*

Key Observation Points

Alternative D would result in impacts similar to Alternative B; however, due to the reduced footprint, the appearance of the facilities would be slightly smaller in scale.

4.12.3.5 BLM Preferred Alternative

VRI (Scenic Quality, Sensitivity Levels, and Distance Zones)

Approximately 720 acres of the BLM Preferred Alternative would occur on lands associated with moderate sensitivity near I-15. The remaining 1,707 acres would occur on low sensitivity lands (Figure 3.12-4). Although the size and location of the Project footprint differs from Alternative B, impacts to scenic quality, sensitivity levels, and distance zones would be similar. Impacts related to designation of the ACEC would be as described for Alternative D.

Key Observation Points

Generally, the BLM Preferred Alternative would result in impacts to the KOPs similar to Alternative B. The BLM Preferred Alternative would be smaller and be shifted west as compared to Alternative B; thus viewing distance would vary slightly and the appearance of the facilities would be slightly smaller in scale. Impacts related to designation of the ACEC would be as described for Alternative D.

4.12.4 Mitigation Measures

Detailed mitigation requirements and Applicant Proposed Environmental Protection Measures can be found in *Section 2.7 Mitigation Measures* Table 2-3 and Table 2-4 in this document. Specific mitigation measures include:

MM VIS-1: Visual Contrast Reduction.

4.12.5 Residual Effects

The reduction of visual contrast associated with MM VIS-1 would reduce but not eliminate the proposed Project's dominance in the existing landscape setting upon VRM Class III lands, viewed from KOP 6 and KOP 10.

4.13 TRANSPORTATION/MOTORIZED VEHICLE ACCESS

Transportation and motorized vehicle routes that provide access to and within the Silver State Solar Project study area are fully described in the 2010 Final EIS in *Section 3.13 Transportation/Motorized Vehicle Access* and are summarized in *Section 3.13* of this document. Competitive OHV races that traverse the roads, trails, and washes of the Project area, are fully described in the 2010 Final EIS in *Section 3.11 Recreation* and are summarized in *Section 3.11* of this document. The CESA for transportation and motorized vehicle access is described in *Section 4.19 Cumulative Impacts* in this document.

4.13.1 Indicators

The Proposed Action would affect transportation levels if it would:

- Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system;
- Produce an exceedance, either individually or cumulatively, of a LOS standard established by the local county congestion management agency;
- Degrade existing road conditions as a result of construction;
- Prevent adequate emergency access;
- Cause loss of access to private land parcels; or
- Cause loss of access to historically important recreation access points or staging areas.

4.13.2 Direct and Indirect Effects by Alternatives

There would only be direct effects to transportation and motorized vehicle access.

4.13.2.1 Alternative A - No Action Alternative

Under this alternative, the BLM would not approve the Applicant's ROW application and would not amend the RMP. The BLM would continue to manage land encompassing the Project area consistent with the existing RMP.

Because there would be no amendment and no solar project approved for the site under this alternative, it is expected that the site would continue to remain in its existing condition with no new structures or facilities constructed or operated on the site. As a result, none of the impacts to transportation and motorized vehicle access from the proposed Project would occur. In the absence of this Project, other renewable energy projects may be constructed to meet State and Federal mandates and those projects may have similar impacts in other locations.

4.13.2.2 Alternative B – Applicant's Proposed Project

The implementation of Alternative B could result in several effects on transportation and motorized vehicle access. Effects to traffic are detailed below.

Effect TRAN-1: Short-term effects on traffic volume as a result of construction.

Construction of the Project would require activities and equipment movement near and within public roadway ROWs, resulting in short-term increases in the use of I-15 and local arterial roadways. Existing conditions of potentially affected road segments can be found in the 2010 Final EIS in *Table 3.13-3 Existing Traffic Volumes and Levels of Service* in *Section 3.13 Transportation /Motorized Vehicle Access*. Heavy equipment would be transported to the site and would likely remain on site for the duration of construction.

Construction of the proposed Project would result in a short-term increase in traffic volume and trips. The Applicant is proposing to access the proposed Project site using the access road shown in Figure 2-1. Effects to local traffic patterns are discussed by road type.

Interstate 15. Construction of the proposed Project would result in a short-term increase in traffic volume on I-15 from construction workers and delivery vehicles. A full discussion of the effect on I-15 can be found in the 2010 Final EIS in *Section 3.13 Transportation/Motorized Vehicle Access*. Effects to I-15 would be reduced through implementation of mitigation measure **MM TRAN-1** (Traffic Management Plan).

Local Arterial Roadways. Construction of the proposed Project would have a short-term negative impact on intersection LOS during construction due to vehicle trips from construction workers and deliveries. Effects to intersections would be reduced through implementation of **MM TRAN-1** (Traffic Management Plan).

Effect TRAN-2: Short-term effects on access and road conditions as a result of construction.

The proposed Project may result in damage to public roads through increased use and movement of heavy equipment. Mitigation **MM TRAN-1** (Traffic Management Plan) and **MM TRAN-2** (Repair Damaged Streets) would reduce these impacts

Effect TRAN-3: Long-term effects on road conditions as a result of construction.

Operation and Maintenance. O&M of the Project may result in a long-term increase in traffic volume of up to 30 trips per day (for a staff of 15, including morning and evening trips). There would also be irregular increases in traffic volume due to scheduled and unscheduled maintenance. The additional traffic volume generated during O&M would be a long-term increase in traffic volumes but would not decrease or disrupt existing primary access on public roads throughout the area, nor would it affect the LOS.

Decommissioning. Activities during decommissioning would include facility removal, breaking concrete pads and foundations, removal of access roads that are not maintained for other uses, and revegetation of the site. Short-term increases in the use of local roadways would occur during the decommissioning period from the transport of heavy equipment and labor force.

Heavy equipment would remain at the site until reclamation was completed, and the labor force would be expected to add no more than 24 trips per day to local roads (assuming 12 people driving to and from the site). Overweight and oversized loads could cause short-term disruptions to local traffic.

4.13.2.3 Alternative C - Alternative Layout

Effects on transportation and motorized vehicle access under Alternative C would be similar to those identified under Alternative B. Compared to Alternative B, the footprint of the Project would be decreased, but type, intensity, and duration of the effects would be similar. The same mitigation would be applicable.

4.13.2.4 Alternative D - Modification to Proposed Action Layout

Effects on transportation and motorized vehicle access under Alternative D would be similar to those identified under Alternative B. Compared to Alternative B, the footprint of the Project would be decreased, but type, intensity, and duration of the effects would be similar. The same mitigation would be applicable.

The designation of the ACEC under Alternative D would not substantially affect transportation/motorized vehicle access within the 30,912-acre area under consideration. Management prescriptions proposed for the ACEC to restrict creation of new OHV trails are addressed in *Section 4.11 Recreation*.

4.13.2.5 BLM Preferred Alternative

Effects on transportation and motorized vehicle access under the BLM Preferred Alternative would be similar to those identified under Alternative B, C or D, but construction effects would occur over a shorter duration. Compared to Alternative B, the footprint of the Project would be smaller and shifted west, but the type and intensity of the effects would be similar. Public vehicular access through the site would be maintained in a similar manner through availability of the maintenance road, and the same mitigation measures for transportation/ motorized vehicle access would apply. Impacts related to designation of the 31,859-acre ACEC would be as described for Alternative D.

4.13.3 Mitigation Measures

Detailed mitigation requirements and Applicant Proposed Environmental Protection Measures can be found in this document in *Section 2.7 Applicant-Proposed Measures and Mitigation Measures*, Table 2-3 and Table 2-4. Specific mitigation measures include:

MM TRAN-1: Traffic Management Plan.

MM TRAN-2: Repair Damaged Streets.

4.13.4 Residual Effects

Under all action alternatives, there would be short-term and long-term increases in traffic volume that could not be eliminated completely through mitigation. Short-term increases would be substantial and would affect the LOS of roads in the proposed Project area, particularly during

peak traffic times. Long-term increases would be minor and would not be likely to affect the LOS at any intersection in the area.

4.14 HEALTH AND SAFETY/HAZARDOUS MATERIALS

Existing conditions related to human health and safety/hazardous materials are described fully in the 2010 Final EIS in *Section 3.14 Human Health and Safety/Hazardous Materials* and are summarized in *Section 3.14* in this document. Hazards associated with seismic conditions are described fully in the 2010 Final EIS in *Section 3.3.3 Seismicity* and summarized in this document in *Section 3.3*, while flood-related hazards are described fully in the 2010 Final EIS in *Section 3.5 Water Resources/ Hydrology* and summarized in *Section 3.5* in this document. The CESA for health and safety/hazardous materials is described in *Section 4.19 Cumulative Impacts*.

4.14.1 Indicators

Adverse effects to health and safety or from hazardous materials would occur if the Proposed Action would:

- Use, store, or dispose of petroleum products and/or hazardous materials in a manner that results in a release to the aquatic or terrestrial environment in an amount equal to or greater than the reportable quantity for that material or creates a substantial risk to human health;
- Mobilize contaminants currently existing in the soil or groundwater, creating potential pathways of exposure to humans or wildlife that would result in exposure to contaminants at levels that would be expected to be harmful;
- Expose workers to contaminated or hazardous materials at levels in excess of those permitted by the Federal Occupational Safety and Health Administration (OSHA) in 29 CFR §1910, or expose members of the public to direct or indirect contact with hazardous materials from the Proposed Action's construction or operations; or
- Expose people residing or working in the Project vicinity or structures to safety hazards and/or a significant risk of loss, injury, or death.

4.14.2 Direct and Indirect Effects by Alternatives

Impacts to health and safety/hazardous materials are described below by Project phase (i.e., construction, operation and maintenance, and decommissioning).

4.14.2.1 Alternative A - No Action Alternative

Under this alternative, the BLM would not approve the Applicant's ROW application and would not amend the RMP. The BLM would continue to manage land encompassing the Project area consistent with the existing RMP.

Because there would be no amendment and no solar project approved for the site under this alternative, it is expected that the site would continue to remain in its existing condition with no new structures or facilities constructed or operated on the site. As a result, none of the impacts to

health and safety or hazardous materials from the proposed Project would occur. In the absence of this Project, other renewable energy projects may be constructed to meet State and Federal mandates and those projects may have similar impacts in other locations.

4.14.2.2 Alternative B – Applicant’s Proposed Project

Potential safety risks associated with construction and operation of the proposed Project range from accidental spills or releases of hazardous substances, mobilization of existing contamination, handling and disposal of hazardous materials, and potential exposure to electrical, flood, fire, and aircraft operation hazards.

Effect HAZ-1: Use, store, transport, and disposal of petroleum products and hazardous materials in a manner that results in a release in an amount equal to or greater than the reportable quantity for that material or that creates a substantial risk to human health.

Construction. Impact-generating activities would include: fencing environmental clearance areas for protecting sensitive species; establishing site access and laydown areas; constructing two water wells and a temporary water storage pond; preparing the site by clearing and removing vegetation, clearing, grading and excavating the solar field, substations and O&M area; constructing drainage control berms; constructing two substations and associated switchyards; installing two overhead transmission lines, overhead lines to supply electricity to the Primm Substation and communication facilities, and the loop-in to the El Dorado-Ivanpah Transmission Project (EITP); installing solar PV equipment in the proposed solar field, and installing a fire protection system.

Spill clean-up would be required to comply with Federal, State, and local regulations; thus, limiting or preventing any potential exposure to any people or wildlife. Therefore, the potential impact of an accidental release of hazardous materials during construction would be short-term and localized. To ensure that potential health and safety effects due to handling of hazardous materials during construction would be minimized to the lowest feasible levels, the Applicant would develop a site-specific SPCC plan and implement **MM HAZ-1**.

Operation and Maintenance. The O&M of the proposed Project would involve the periodic and routine transport, use and disposal of hazardous materials, hydraulic fluid, welding gases (acetylene, oxygen, and argon), pesticides (at the O&M building only), and herbicide (Roundup® or equivalent). Only pesticides, insecticides, and herbicides listed on the BLM-approved label list are authorized for use on public lands. Under APM-17, A Pesticide Use Proposal must be submitted for each chemical used, and it cannot be used until approval has been obtained in writing from the BLM. The Pesticide Use Proposal must show the type and quantity of material to be used, pest(s) to be controlled, method of application, locations of storage and disposal of containers, and any other information deemed necessary by the BLM. Hazardous wastes generated by the Project would include: lubricating oil, oily rags used during maintenance, waste oil sorbents used for cleanup of small spills and diesel used to fuel a backup firewater pump. Hazardous substances that would be used have low and moderate (acetylene only) toxicity under the National Fire Protection Association health rating and would be recycled or disposed of by a certified oil recycler. The proposed Project would have to comply with

regulations set by the Nevada State Fire Marshal and the Clark County Fire Department for the proper storage of these hazardous materials on-site.

Dielectric fluid and cadmium telluride (CdTe) would be utilized in the carbon steel transformers and modules respectively. The dielectric fluid is mineral oil and is not considered hazardous (Zayed and Phillippe 2012). The CdTe is a semiconductor material used between two sheets of glass that make up the solar modules. *Independent testing indicates that the CdTe does not pose a health risk during fires, as the material becomes encapsulated in molten glass when exposed to fire (Fthenakis et al. 2005). Refer to page 4-112 in the 2010 Final EIS for more details regarding CdTe.* Mitigation measure **MM HAZ-2** would be recommended for the proposed Project to provide a recycling option for the CdTe containing PV panels (Table 2-4).

Compliance with and implementation of Federal, State, and local regulations, **MM HAZ-1**, **MM HAZ-2**, SPCC plan, SWPPP, and Waste Management and Emergency Response plans would reduced the likelihood of a hazardous material release (Table 2-3 and Table 2-4). Therefore, the potential impact of an accidental release of hazardous materials during the proposed Project's operations and would be short-term and localized.

Decommissioning. Closure activities (refer to *Section 2.6.1* in this document) would result in a limited potential for release of hazardous materials. Proper compliance with, and implementation of the Facility Decommissioning Plan, **MM HAZ-1**, **MM HAZ-2**, Federal, State, and local regulations would minimize the potential of a spill and the risk of soil contamination or exposure of hazardous substances (Table 2-3 and Table 2-4 in this document).

Effect HAZ-2: Expose human or ecological receptors to potentially hazardous levels of chemicals or explosives due to the disturbance or unearthing of contaminated soils or groundwater of hazardous waste into soils.

Construction. Four closed mining claims suggest the possibility of past mining activities within the boundaries of the Project footprint (BLM 2012). Contamination from a nearby pipeline or the mining claims may be possible, but contamination from other sources (pesticide, fertilizer, hazardous material, etc) is unlikely. Mitigation measure **MM HAZ-3**, the Health and Safety Program, Waste Management Plan, and Emergency Response Plan would be implemented for the proposed Project to reduce potential exposure of workers to contaminated soils (Table 2-3 and Table 2-4 in this document). Any contamination that was discovered would be disposed of according to State and Federal regulations

Operation and Maintenance. The operations and routine maintenance of the proposed Project would involve limited disturbance or unearthing of contaminated soils or groundwater of hazardous materials compared to construction activities. Unscheduled maintenance could involve the potential repair and eventual replacement of solar panels, inverters, switchyard equipment, and Digital Control Systems, requiring a minor level of soil disturbance. The proposed Project would require implementation of **MM HAZ-1** and **MM HAZ-3** (Table 2-3 and Table 2-4 in this document) for any excavation, grading, trenching or drilling activity required as a result of routine and unscheduled maintenance. The Applicant's Health and Safety Program and Waste Management Plan would be required to include special preventive and contingency measures to avoid the workers' exposure to contaminated soils or groundwater (Table 2-3 in this document).

Therefore, the exposure to contaminants due to disturbance or unearthing of contaminated soil or groundwater during maintenance repairs is unlikely.

Decommissioning. Decommissioning the proposed Project may have potential impacts to soil and groundwater resources. Closure activities that would disturb soil and groundwater include: the removal of solar panels and supporting foundations; removal of underground facilities to a depth of at least 2 feet below the ground surface; demolition and removal of the O&M building; removal of transmission poles and conductors; and closure and abandonment of water wells and the septic tank. If a spill of hazardous materials occurs, residual contamination could be unearthed.

Proper compliance with, and implementation of the Facility Decommissioning Plan, **MM HAZ-1**, **MM HAZ-3**, Federal, State, and local regulations, and the Health and Safety Program would limit or prevent exposure of people or wildlife to existing contaminants in the soil or groundwater and ensure proper disposal (Table 2-3 and Table 2-4 in this document).

Effect HAZ-3: Worker exposure to contaminated or hazardous materials at levels in excess of those permitted by the Federal OSHA in 29 CFR, Part 1910, or expose members of the public to direct or indirect contact with hazardous materials from Project construction or operations.

Construction, O&M, and decommissioning activities could temporarily expose workers to direct or indirect contact with hazardous materials. Although workers would have OSHA-required training in handling of hazardous materials, workers could be exposed in excess of permitted levels if an accident were to occur. The Applicant would develop and implement a Health and Safety Program requiring all employees and contractors to adhere to industry standards for health and safety and emergency response. Mitigation measures **MM HAZ-1**, **MM HAZ-2**, **MM HAZ-3**, **MM HAZ-4**, and an Emergency Response Plan would be implemented for the proposed Project to reduce exposure of hazardous material to levels acceptable by the standards set by OSHA in 29 CFR, Part 1910 (Table 2-3 and Table 2-4 in this document).

Effect HAZ-4: Expose people or structures to a risk of loss, injury, or death involving electrocution or excessive exposure to wildland fires, including where wildlands are adjacent to urbanized areas.

Construction. During construction, proposed Project activities and related equipment could expose people or structures to an increased risk of loss, injury, or death as a result of electrocution or exposure to wildland fires. The risk of fire danger would be related to accidental ignition from smoking, refueling, and operating vehicles and other equipment off roadways. The two activities with the highest risk of fire ignition are clearing of brush and welding of PV panel assemblies. The proposed Project would implement mitigation measures **MM HAZ-4** and **MM HAZ-5**, and utilize designs that fulfill required standards and codes for fire and electrical safety (Table 2-3 and Table 2-4 in this document).

Operation and Maintenance. O&M of the proposed Project would increase the potential for incidents related to electrical arcing and sparking from any wires that might become exposed between solar panels and substations. The proposed Project would reduce fire risk by installing a fire break and housing electrical equipment in enclosures. The proposed Project must comply

with Federal and State standards and implement **MM HAZ-4** (Table 2-3 and Table 2-4 in this document).

Decommissioning. Demolition of structures and decommissioning of electrical equipment would pose a fire risk that could be controlled by proper implementation of **MM HAZ-4**, **MM HAZ-5** and the Facility Decommissioning Plan (Table 2-3 and Table 2-4 in this document). Adherence to these preventive measures along with applicable Federal, State, and local requirements would reduce the potential risk of loss, injury, or death involving electrocution or excessive exposure to wildland fires.

Effect HAZ-5: Present an obstruction or hazard to air navigation as determined by the Federal Aviation Administration (FAA) under 14 CFR Part 77.

The proposed Project would need to comply with Part 77 of the FAA Regulations which states that any party proposing to construct an object or structure near a proposed public-use airport must notify the FAA before construction begins. In turn, the FAA is obligated to examine whether the structure would interfere with air navigation facilities and equipment or the navigable airspace.

4.14.2.3 Alternative C - Alternative Layout

Effects under Alternative C would be similar to those identified under Alternative B. Compared to Alternative B, the footprint of the Project would be decreased, but materials and exposure types would be similar. The same mitigation measures and adherence to industry standards and, Federal, State and local regulations would apply.

4.14.2.4 Alternative D - Modification to Proposed Action Layout

Effects under Alternative D would be similar to those identified under Alternative B. Compared to Alternative B, the footprint of the Project would be decreased, but materials and exposure types would be similar. The same mitigation measures and adherence to industry standards and, Federal, State and local regulations would apply.

The designation of the ACEC under Alternative D would not substantially affect health and safety/ hazardous materials within the 30,912-acre area under consideration. Management prescriptions proposed for the ACEC for development, recreation and other activities that would potentially impact these resources (refer to Table 2-2 in this document) would generally be similar or more restrictive when compared to existing management in this area. However, the potential displacement of some OHV riders and other recreational users (e.g., shooters) could result in increased conflicts in other areas outside the ACEC as incompatible uses are concentrated in other recreational areas. Because these activities would still be allowed in the ACEC, it is not expected that the displacement would be substantial and the increased risk to health and safety would be minimal.

4.14.2.5 BLM Preferred Alternative

Effects to health and safety/ hazardous materials under the BLM Preferred Alternative would be similar to those identified under Alternative B, C, or D. Compared to the other action alternatives, the footprint of the Project would be smaller, but materials and exposure types would be the same. The same mitigation measures and adherence to industry standards and Federal, State and local regulations would apply. Impacts related to designation of the 31,859-acre ACEC would be as described for Alternative D.

4.14.3 Mitigation Measures

Detailed mitigation requirements and Applicant-Proposed Environmental Protection Measures can be found in this document in *Section 2.7 Applicant-Proposed Measures and Mitigation Measures*, Table 2-3 and Table 2-4. Specific mitigation measures include:

MM HAZ-1: Hazardous Materials Management.

MM HAZ-2: Solar PV Cell Recycling.

MM HAZ-3: Characterize Potentially Contaminated Soil/Groundwater.

MM HAZ-4: Adherence of the Health and Safety Program with 29 CFR, Part 1910.

MM HAZ-5: Construction Fire Prevention Measures.

APM-4: Storm Water Pollution Prevention Plan.

APM-5: Spill Prevention, Control, and Countermeasures Plan.

APM-6: Health and Safety Program.

APM-7: Emergency Response Plan.

APM-8: Waste Management Plan.

APM-9: Noxious Weed Control Plan.

APM-10: Site Rehabilitation and Facility Decommissioning Plan

APM-15: General Design and Construction Standards.

APM-17: Pesticide Use Proposal

4.14.4 Residual Effects

Under all alternatives, proper handling, storage and clean-up of hazardous materials would result in no residual effects from hazardous materials. Based on FAA review of the Silver State Solar project as previously analyzed (BLM 2010), review and approval of the proposed Project by the FAA prior to construction would result in no residual aviation impacts from the development of the proposed Project.

4.15 SOCIAL AND ECONOMIC CONDITIONS

The social and economic conditions within the region and in the Silver State Solar Project study area are fully described in the 2010 Final EIS in *Section 3.15 Social and Economic Conditions* and are summarized in *Section 3.15* of this document. The CESA for socioeconomic resources is described in *Section 4.19 Cumulative Impacts*.

4.15.1 Indicators

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

For the purposes of this analysis, the Proposed Action would affect social and economic conditions if it would:

- Result in a permanent or temporary population increase larger than local services, infrastructure, or population can accommodate; or
- Result in a tax burden to local residents not offset by the Proposed Action’s generation of new public revenues.

4.15.2 Direct and Indirect Effects by Alternatives

4.15.2.1 Alternative A - No Action Alternative

Under this alternative, the BLM would not approve the Applicant’s ROW application and would not amend the RMP. The BLM would continue to manage land encompassing the Project area consistent with the existing RMP.

Because there would be no amendment and no solar project approved for the site under this alternative, it is expected that the site would continue to remain in its existing condition with no new structures or facilities constructed or operated on the site. As a result, none of the impacts to social and economic conditions from the proposed Project would occur. In the absence of this Project, other renewable energy projects may be constructed to meet State and Federal mandates and those projects may have similar impacts in other locations.

4.15.2.2 Alternative B – Applicant’s Proposed Project

Effect SOC-1: Provide employment and demand for local goods and services during construction and operation.

During the peak construction period, up to 350 workers are expected to be employed. This would result in a short-term and beneficial impact on the Clark County population level. The impact would not cause a temporary population increase that would necessitate additional local public services or investment in infrastructure capacities that could not be provided from existing resources. The operational phase of the proposed Project is expected to employ 15 full-time permanent workers, which would have a long-term and beneficial impact on the area's population level.

The construction phase is expected to have a short-term and beneficial impact on the Clark County permanent and temporary housing stock. The impact would not cause a temporary strain that would necessitate additional local public services or investment in public infrastructure capacities that could not be provided from existing resources. The operational phase of the proposed Project is anticipated to have a long-term beneficial effect on the area's housing stock, as housing in the Las Vegas area is readily available.

The construction phase mobilization of resources (i.e., workforce, materials, supplies and equipment) would be beneficial to the region's economy that has been mired in recession. Project construction spending provides a non-recurrent demand stimulus that would invigorate other interdependent sectors, industries and households within Clark County over a three-year period.

Construction would remain roughly the same in terms of intensity and duration as compared to the analysis conducted as part of the 2010 Final EIS, with similar beneficial socioeconomic impacts to employment and income to regional businesses.

During operations, the Project's permanent direct employment, payroll and O&M related spending would provide a long-term, beneficial, recurring stimulus to the region's economy.

Effect SOC-2: Increase demand on public services.

The incremental demand on public services from the proposed Project during construction, operations, and decommissioning is not anticipated to result in extraordinary stresses placed on service capacities or infrastructure that could not be met by existing and projected public resources (i.e., projected County operating budgets and capital expenditures already planned for to meet population growth).

Effect SOC-3: Adversely affect the business of commercial off-highway vehicle operations and organized events through disruption of existing routes.

Initial consultation with off-road racing groups indicates that the revised Project footprint for the proposed Project would have greater potential for displacement of organized off-highway races and dispersed informal off-highway OHV activity than the layout analyzed in the 2010 Final EIS. Therefore, there is a potential for greater socioeconomic impacts to the surrounding area from loss of these visitors than were identified in the 2010 Final EIS. However, the Project layout has been designed to allow passage of vehicles through the Project area via a widened access route, and **MMs REC-1** and **REC-2** would provide appropriate signage and ensure continued access during the Project lifetime. More information about the proposed Project's impact to the existing recreational economy can be found in this document in *Section 4.12 Recreation.*

4.15.2.3 Alternative C - Alternative Layout

Impacts to socioeconomics under Alternative C would be similar to the impacts described for Alternative B. Construction would remain roughly the same in terms of intensity and duration, resulting in similar beneficial socioeconomic impacts to employment and income to regional businesses. The Project footprint would be modified so there may be slight changes to which OHV trails are impacted, but an access route through the Project footprint would be provided similar to Alternative B. Therefore, the impact to socioeconomics would be expected to remain similar to that described for Alternative B.

4.15.2.4 Alternative D - Modification to Proposed Action Layout

Impacts under Alternative D would be similar to the impacts described for Alternative B. The design of Alternative D avoids more of the OHV recreation and race area than the other two alternatives, leading to less of an impact on OHV recreation. As with Alternatives B and C, an access road through the Project area would link race routes and OHV trails to reduce disruption of existing OHV recreation and races. Recreation is a strong economic driver in the community of Primm, so the less of an effect the proposed Project has on OHV recreation, the less the economy of Primm would be impacted adversely by the proposed Project. The designation of the ACEC under Alternative D would not substantially affect recreational tour operators or other recreation-related businesses within the 30,912-acre area under consideration. Management prescriptions proposed for the ACEC for recreation (refer to Table 2-2 in this document) would generally be similar when compared to existing management in this area. Further, restrictions on most development in the ACEC would ensure that further disruption to existing trails would be reduced. Existing race routes and OHV trails within the ACEC would be allowed to remain and maintenance of these trails would be allowed provided the trails are not widened beyond their condition at the time of ACEC establishment (refer to Table 2-2). Therefore, the ACEC designation and related management prescriptions would have minor adverse impacts to socioeconomic conditions.

4.15.2.5 BLM Preferred Alternative

Impacts to socioeconomics under the BLM Preferred Alternative would be similar to the impacts described for Alternative B, C, or D, but beneficial impacts to construction and operational employment and regional businesses would be somewhat reduced due to the smaller Project layout. The smaller Project footprint would potentially disrupt fewer OHV trails, and as with Alternatives B, C, and D an access road through the Project area would link race routes and OHV trails to reduce disruption of existing OHV recreation and races. Therefore, both beneficial effects and adverse effects to socioeconomics would be expected to be somewhat less than described for Alternative B. Impacts related to designation of the ACEC would be as described for Alternative D.

4.15.3 Mitigation Measures

Detailed mitigation requirements can be found in *Section 2.7 Applicant-Proposed Measures and Mitigation Measures*, Table 2-4. Specific mitigation measures include:

MM REC-1: Signage Plan for Trail Identification.

MM REC-2: Use of Project Access Road Outside of the Perimeter Fence.

4.15.4 Residual Effects

There would be benefits to population, housing, regional economy, personal income, employment levels, public services and tax revenue from construction and O&M of the proposed Project. However, there would also be negative residual impacts from lost OHV recreationalists. The exact way these beneficial and detrimental residual effects would balance out is difficult to predict.

4.16 ENVIRONMENTAL JUSTICE

Environmental justice populations in the regional area and the Silver State Solar Project study area are fully described in the 2010 Final EIS in *Section 3.16 Environmental Justice* and summarized in *Section 3.16* in this document. The CESA for environmental justice is described in *Section 4.19* in this document.

4.16.1 Indicators

Consistent with *Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (February 11, 1994), this environmental justice analysis identifies and addresses any disproportionately high and adverse human health or environmental effects of its actions on minority and low-income populations. The CEQ (1997) has issued guidance to Federal agencies on the definition of disproportionately high and adverse effects as used in Executive Order 12898, as follows:

Disproportionately High and Adverse Human Health Effects. When determining whether human health effects are disproportionately high and adverse, agencies are to consider the following three factors to the extent practicable:

1. Whether the health effects, which may be measured in risks and rates, are significant (as employed by NEPA), or above generally accepted norms;
2. Whether the risk or rate of hazard exposure to a minority population, low-income population, or Indian tribe to an environmental hazard is significant (as employed by NEPA) and appreciably exceeds or is likely to appreciably exceed the risk or rate to the general population or other appropriate comparison group; and
3. Whether health effects occur in a minority population, low-income population, or Indian tribe affected by cumulative or multiple adverse exposure to environmental hazards.

Disproportionately High and Adverse Environmental Effects. When determining whether environmental effects are disproportionately high and adverse, agencies are to consider the following three factors to the extent practicable:

1. Whether there is or will be an impact on the natural or physical environment that significantly (as employed by NEPA) and adversely affects a minority population, low-

income population, or Indian tribe. Such effects may include ecological, cultural, human health, economic, or social impacts on minority communities, low-income communities, or Indian tribes when those impacts are interrelated to impacts on the natural or physical environment;

2. Whether environmental effects are significant (as employed by NEPA) and are or may be having an adverse impact on minority populations, low-income populations, or Indian tribes that appreciably exceed or are likely to appreciably exceed those on the general population or other appropriate comparison group; and
3. Whether the environmental effects occur or would occur in a minority population, low-income population, or Indian tribe affected by cumulative or multiple adverse exposures from environmental hazards.

In addition, the BLM Land Use Planning Handbook defines BLM's environmental justice principles and considers "aggregate, cumulative, and synergistic effects, including results of actions taken by other parties" (BLM 2005).

4.16.2 Direct and Indirect Effects by Alternatives

4.16.2.1 Alternative A - No Action Alternative

Under this alternative, the BLM would not approve the Applicant's ROW application and would not amend the RMP. The BLM would continue to manage land encompassing the Project area consistent with the existing RMP.

Because there would be no amendment and no solar project approved for the site under this alternative, it is expected that the site would continue to remain in its existing condition with no new structures or facilities constructed or operated on the site. As a result, none of the impacts to environmental justice from the proposed Project would occur. In the absence of this Project, other renewable energy projects may be constructed to meet State and Federal mandates and those projects may have similar impacts in other locations.

4.16.2.2 Alternative B – Applicant's Proposed Project

No environmental justice communities are known to be present in the new ROW for the proposed Project based on census data indicators, so no impacts to environmental justice would occur. However, the community of Primm is largely made up of worker housing (i.e., Desert Oasis apartments) for employees of the nearby casinos. This worker housing may constitute an environmental justice community despite the fact that census data indicates no at-risk populations.

However, the issue of environmental justice focuses on impacts that may lead to health problems disproportionately affecting one population more than others because of socioeconomic factors. The proposed Project does not have any impacts that would *substantially* impact the health of nearby residents; therefore, environmental justice impacts for the proposed Project would be *negligible* even if the Desert Oasis worker housing constitutes an environmental justice community.

4.16.2.3 Alternative C - Alternative Layout

Impacts under Alternative C would be consistent with the impacts described for Alternative B.

4.16.2.4 Alternative D - Modification to Proposed Action Layout

Impacts under Alternative D would be consistent with the impacts described for Alternative B.

4.16.2.5 ***BLM Preferred Alternative***

Impacts to environmental justice under the BLM Preferred Alternative would be consistent with the impacts described for Alternative B, C, or D.

4.16.3 Mitigation Measures

No mitigation measures required.

4.16.4 Residual Effects

Residual effects may include decreased air quality (refer to *Section 4.2 Air Quality and Climate*) or increased exposure to hazardous materials (refer to *Section 4.15 Health and Safety/Hazardous Materials*), neither of which are anticipated to be substantial adverse effects.

4.17 ENERGY AND MINERALS

Energy and minerals in the regional area and the Project study area are fully described in the 2010 Final EIS in *Section 3.17 Energy and Minerals* and are summarized in *Section 3.17* in this document. The CESA for energy and minerals are described in *Section 4.19 Cumulative Impacts* in this document.

4.17.1 Indicators

Adverse effects on energy and minerals resources would occur if the Proposed Action would:

- Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the State;
- Result in the loss or availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan; or
- Restrict access to or the availability of mineral or energy resources.

4.17.2 Direct and Indirect Effects by Alternatives

4.17.2.1 Alternative A - No Action Alternative

Under this alternative, the BLM would not approve the Applicant's ROW application and would not amend the RMP. The BLM would continue to manage land encompassing the Project area consistent with the existing RMP.

Because there would be no amendment and no solar project approved for the site under this alternative, it is expected that the site would continue to remain in its existing condition with no new structures or facilities constructed or operated on the site. As a result, none of the impacts to energy and minerals from the proposed Project would occur. In the absence of this Project, other renewable energy projects may be constructed to meet State and Federal mandates and those projects may have similar impacts in other locations.

4.17.2.2 Alternative B – Applicant's Proposed Project

There are currently four closed mining claims within the Alternative B Project footprint. They are considered to be locatable, which means they are regulated under the 1872 Mining Law that grants U.S. citizens the right to prospect, explore and develop these minerals on public domain lands that have not been "withdrawn" from mineral entry by Congress or the Secretary of the Interior. An additional 40 claims were located within a 1-mile radius of the proposed Project site (BLM 2012), all but two of which were closed in the late 1980s.

Effect EAM-1: Restrict access to or the availability of fluid leasable mineral or energy resources within the proposed Project area.

There are no oil or gas producers or seeps within 5 miles of the revised ROW application area; therefore, there would be no impact on fluid leasable mineral or energy resources.

Effect EAM-2: Restrict access to or the availability of locatable mineral or energy resources within the proposed Project area.

There are four closed mining claims within the proposed Project area. The closed mining claims would not be impacted by the restricted access induced by the development of the proposed Project because they are no longer active.

Effect EAM-3: Restrict access to or the availability of saleable mineral or energy resources within the proposed Project area.

Saleable resources exist near the proposed Project site, but because they are not within the proposed Project site, the proposed Project would not have an effect on saleable mineral or energy resources.

4.17.2.3 Alternative C - Alternative Layout

Impacts to energy and minerals under Alternative C would be consistent with the impacts described for Alternative B.

4.17.2.4 Alternative D - Modification to Proposed Action Layout

Impacts under Alternative D would be consistent with the impacts described for Alternative B. The designation of the ACEC under Alternative D would not substantially affect energy and mineral resources within the 30,912-acre area under consideration. Although management prescriptions proposed for mineral resources within the ACEC would potentially limit the development of solid leasable resources, all other types of mineral development would be open or allowed on a case-by-case basis with resource protection (refer to Table 2-2 in this document).

4.17.2.5 BLM Preferred Alternative

Impacts to energy and minerals under the BLM Preferred Alternative would be consistent with the impacts described for Alternative B, C, and D. Impacts related to designation of the 31,859-acre ACEC would be as described for Alternative D.

4.17.3 Mitigation Measures

No mitigation measures are required.

4.17.4 Residual Effects

No residual effects to energy or mineral resources would occur.

4.18 FUELS AND FIRE MANAGEMENT

Fuels and fire management in the regional area and the Project study area are fully described in the 2010 Final EIS in *Section 3.18 Fuels and Fire Management* and are summarized in *Section 3.18* in this document. The CESA for fuels and fire management is described in *Section 4.19 Cumulative Impacts* in this document.

4.18.1 Indicators

Adverse effects on fuels and fire management would occur if the Proposed Action would fail to:

- Maintain an adequate fuel break around the proposed Project perimeter during construction, O&M, and decommission of the proposed Project;
- Adhere to mowing BMPs with the goals of minimizing natural or human-caused fire starts or spread and maximizing ecological health in and around the proposed Project area; or
- Regularly monitor for and treat weed infestations to eliminate colonization and minimize spread of weed species as outlined in the Noxious Weed Control Plan (APM-9).

4.18.2 Direct and Indirect Effects by Alternatives

4.18.2.1 Alternative A - No Action Alternative

Under Alternative A, there would be no construction and the proposed Project site would not be disturbed; thus, there would be no effect on fuels or fire management.

4.18.2.2 Alternative B – Applicant’s Proposed Project

Effect FFM-1: The introduction or spread of invasive or noxious weeds.

As described in this document in *Section 4.6 Biological Resources*, the proposed Project would have adverse impacts to introduction and spread of invasive or noxious species because of the disturbance to the site and the presence of personnel and vehicles. An increase in non-native vegetation could increase the risk of fire due to greater fuel load as compared to existing conditions. Under **APM-9**, a BLM–approved Noxious Weed Control Plan would be prepared or an existing plan updated to address specific management issues within the Project footprint.

The proposed Project would construct a 20-foot wide fire break and develop an integrated weed management plan to minimize long-term impacts. At the end of the facility’s life, implementation of **APM-10** may help to reduce permanent impacts through rehabilitation and revegetation of the site but long-term success in control of fire fuel load may be dependent on how the site is managed during its operation.

Effect FFM-2: Allocation of BLM fire resources to the proposed area for fire suppression.

BLM fire suppression resources for Southern Nevada includes three seasonally maintained fire stations, four engines, two utility terrain vehicles, one water tender, and, as dictated by the fire danger, a Single Engine Air Tanker. Personnel include approximately 25 career seasonal/seasonal firefighters, 11 permanent fire positions in the southern Nevada District Office and a 20-person Southern Nevada Hand Crew (No. 1). Additionally, non-fire BLM employees provide fire support and suppression duties as needed (BLM 2011b). Wildland fire would be managed with a management response as described in the Las Vegas Fire Management Plan and may include full suppression, natural wildland fires, and prescribed fire use.

Development of the proposed Project would increase the service load on BLM fire resources needed to respond to a potential fire at the Project site during construction, O&M or decommissioning. This would result in a reduced ability of the BLM to respond to concurrent fire events. However, the risk of fire associated with the Project is relatively low, as vegetation would be removed from the footprint of the solar array, and the Proponent would be required to develop and implement a site-specific Fire Management Plan and Noxious Weed Control Plan.

4.18.2.3 Alternative C - Alternative Layout

Effects under Alternative C would be similar to those identified for Alternative B. Compared to Alternative B, the footprint of the Project would be decreased, but disturbance and impact to fuel

and fire management would be similar. The same methods of impact reduction would be implemented.

4.18.2.4 Alternative D - Modification to Proposed Action Layout

Effects under Alternative D would be similar to those identified for Alternative B. Compared to Alternative B, the Project footprint would be decreased, but disturbance and impacts to fuel and fire management would be similar. The same methods of impact reduction would be implemented. The designation of the ACEC under Alternative D would not be expected to substantially affect fuels or fire management within the 30,912-acre area under consideration. Management prescriptions that are proposed for the ACEC for fire management (refer to Table 2-2 in this document) would generally be similar when compared to existing management in this area. Therefore, the ACEC designation would have no impacts to fuels and fire management.

4.18.2.5 BLM Preferred Alternative

Effects under the BLM Preferred Alternative would be somewhat less than those identified under Alternative B, C, or D due to the reduced Project footprint. The types of disturbance and impact to fuel and fire management would be similar to Alternative B, C, or D, and the same methods of impact reduction described for Alternative B would be implemented. Impacts related to designation of the 31,859-acre ACEC would be as described for Alternative D.

4.18.3 Mitigation Measures

Detailed Applicant-proposed measures can be found in Section 2.7 Applicant-Proposed Measures and Mitigation Measures, Table 2-3. Specific measures include:

APM-9: Noxious Weed Control Plan

APM-10: Site Rehabilitation Plan and Facility Decommissioning Plan

4.18.4 Residual Effects

The proposed Project may result in residual effects related to increased invasive or noxious species. The development of the site is likely to lead to an increase of invasive or noxious species colonizing areas following disturbance. The increase of flashy fuel may result in ignitions and ultimately increase the number of wildfires. Aggressively managing invasive or noxious species will limit residual effects to manageable levels. This can be done through maintaining discontinuous, dispersed native vegetation, nonflammable native species, propagation and planting of native species, or complete removal of all vegetation.

4.19 CUMULATIVE IMPACTS

The purpose of the cumulative impact analysis is to identify any Project impacts that when combined with past, present and reasonably foreseeable future actions (RFFAs) may result in adverse impacts. These actions include current and projected area development, management

activities, and authorizations on public or private land, land use trends, and applicable industrial/infrastructure components.

The analysis of cumulative impacts in this Supplemental EIS/PRMPA employs the definition of cumulative impacts found in the CEQ regulations (40 CFR 1508.7): “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions.” In many cases, quantitative estimates of cumulative impacts are not possible, and qualitative assessments are provided. Cumulative impacts and RFFAs are further described below.

Cumulative Impacts – Additive or interactive effects that would result from the incremental impact of the proposed action when added to other past, present, and RFFAs, regardless of what agency (Federal or non-Federal) or person undertakes such other actions (40 CFR 1508.7). Interactive effects may be either countervailing, in which the net cumulative effect would be less than the sum of the individual effects, or synergistic, in which the net cumulative effect would be greater than the sum of the individual effects.

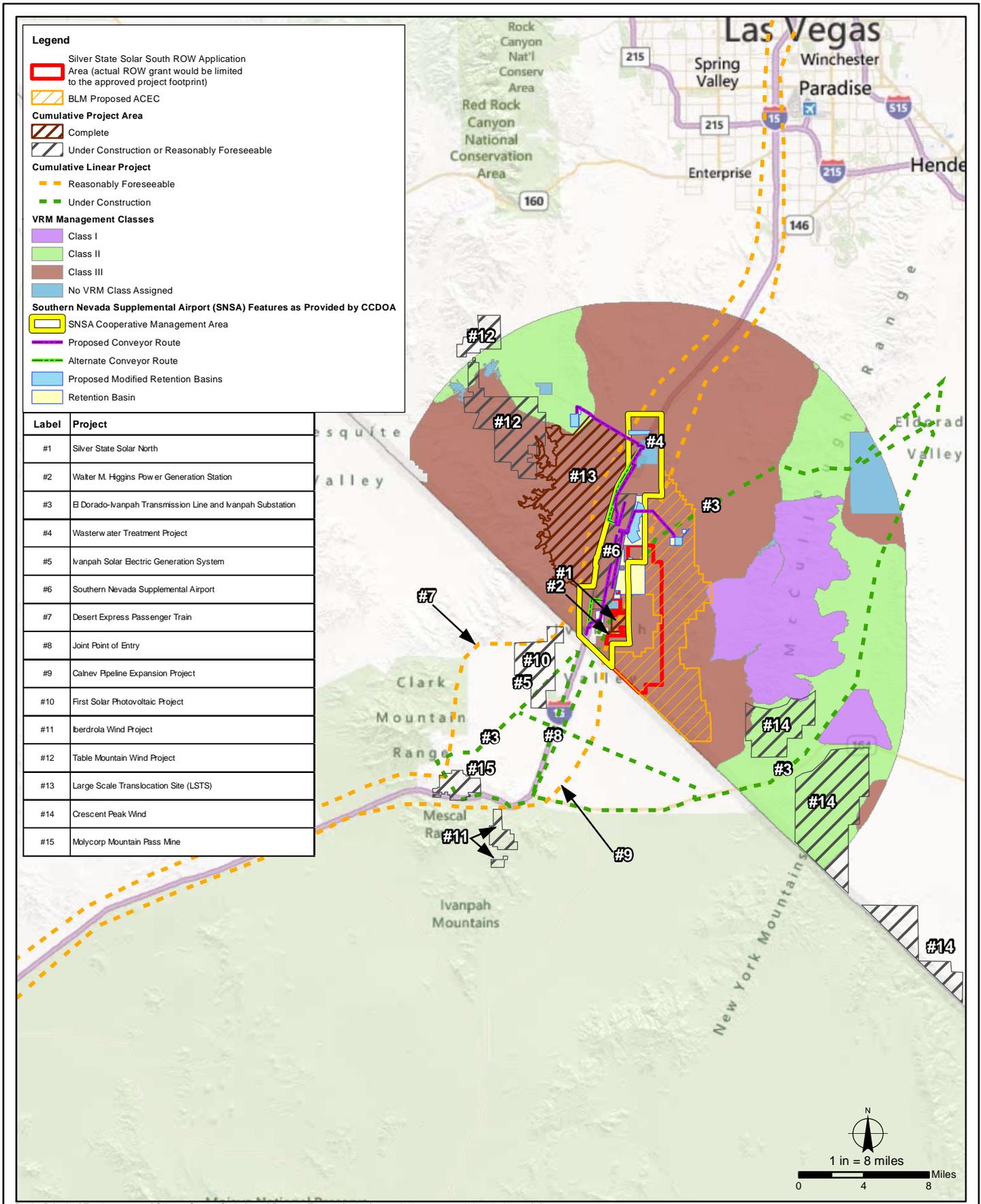
Reasonably Foreseeable Future Actions – RFFAs are potential Federal or non-Federal actions identified within the spatial, or geographic, and temporal scopes of the cumulative effects analysis. The predicted impacts of the RFFAs are combined with the potential direct and indirect effects of the proposed Project to determine potential future cumulative effects on a given resource. The term “reasonably foreseeable” is not defined in the regulations. For this analysis, RFFAs are those that are likely or reasonably certain to occur. Often, their applicability is based on publically available documents such as existing plans, permit applications, or announcements. Potential actions that are speculative or not likely to occur are not considered reasonably foreseeable.

4.19.1 Cumulative Impacts Analysis Methodology

The cumulative impacts on the resources, ecosystem, and human community were considered by first identifying the geographic scope of the cumulative analysis area. The cumulative analysis area varies depending on the resource. For example, the analysis area for geology may be restricted to a geological unit, while the analysis area for the socioeconomic analysis may encompass multiple counties, cities, and jurisdictions. After determining the analysis area, a comprehensive list of past, present, and reasonably foreseeable actions within the analysis area was compiled and utilized to determine the cumulative impacts of the Project and the additional projects identified. Figure 4.19-1 and Table 4.19-1 lists existing (past and present), and reasonably foreseeable projects within the region.

This list of cumulative projects has been updated since the release of the 2010 Final EIS to reflect conditions as of the publication of the NOI for this Supplemental EIS/PRMPA in the Federal Register. The status of all projects has been updated to the extent possible to present their current condition at the time of preparation of the Final Supplemental EIS/PRMPA.

Information about past, present, and reasonably foreseeable future activities in the region were gathered from the BLM, Clark County, and other agencies; adopted plans; environmental documents; and personal communications with public agencies.



**Cumulative Projects
Silver State Solar South Project**

**FIGURE
4.19-1**

Table 4.19-1. List of Projects Considered Within or Near the Ivanpah Valley

<u>Number on Figure 4.19-1</u>	Project	Location	Owner	Project Description	Project Type	Status	Cumulatively Affected Resources
<u>1</u>	Silver State North Solar Project ¹	Located on 618 acres adjacent to the Silver State South ROW application area	Embridge, Inc. (as of March 22, 2012)	First 50 MW phase of the 400 MW Silver State Energy Project analyzed in the 2010 Final EIS	Solar (PV)	<u>Operational</u>	<ul style="list-style-type: none"> – Construction Impact: Air Quality, Noise – Operational Impact: Hydrology, Biology, Recreation, Transportation and Traffic, Aesthetics
<u>2</u>	Walter M. Higgins Power Generation Station ¹	Located adjacent to the Silver State South ROW application area	NV Energy	A 530 MW natural gas-fueled power plant. The plant went into service in 2004 and uses a six-story-high dry cooling system.	Natural Gas Power Plant	In service since 2004. Employs approximately 17 employees. The plant is a major source of PM ₁₀ , NO _x , CO, and a minor source of SO _x , VOC, and HAP (DAQ Part 70 Operating Permit Source 1550)	<ul style="list-style-type: none"> – Construction Impact: Construction completed – Operational Impact: Aesthetics, Air Quality, Noise
<u>3</u>	Southern California Edison Eldorado-Ivanpah 230-kV Transmission Line and Ivanpah Substation ¹	Nipton, CA to Eldorado Substation, NV	Southern California Edison	35-mile transmission line upgrade between the existing Eldorado Substation in the Eldorado Valley near Boulder City, NV, and Proposed Ivanpah Substation in San Bernardino County, CA (southwest of Primm)	Transmission Line and Substation	<u>Operational</u> . Record of Decision issued in May, 2011. The BLM ROW grant for the transmission line and access road under the transmission line will be within the 100 foot wide ROW affecting 419.85 acres of public lands.	<ul style="list-style-type: none"> – Construction Impact: Air Quality – Operational Impact: Hydrology; Transportation and Traffic
<u>4</u>	Wastewater Treatment Project ^{1,2}	East of Jean, NV, approximately 10 miles north of the ROW application area	Jean Development company	Silver State Solar, LLC has entered into a water service agreement (dated June 7, 2011) with the LVVWD, to supply water needed for both the Silver State North and South Projects. Silver State Solar will fund all capital, operation, and maintenance costs necessary to treat wastewater generated by the Jean Prisons so that effluent can be recharged back into the Ivanpah Valley North groundwater basin through Rapid Infiltration Basins located in the Jean area.	Wastewater Treatment Project	<u>Operational</u> . The LVVWD is currently providing groundwater for use on lands associated with the Silver State North Solar Project. Per the Water Services Agreement between Silver State Solar and LVVWD, water for Silver State Solar North operations and construction and operation of Silver State Solar South would be available after LVVWD receives a Wastewater Treatment Project Completion Notice, expected between 2013 and 2017.	<ul style="list-style-type: none"> – Construction Impact: Air Quality; Noise; – Operational Impact: Hydrology; Land Use; Biology; Aesthetics

Table 4.19-1. List of Projects Considered Within or Near the Ivanpah Valley (Continued)

<u>Number on Figure 4.19-1</u>	Project	Location	Owner	Project Description	Project Type	Status	Cumulatively Affected Resources
<u>5</u>	Ivanpah Solar Electric Generation System (ISEGS) ¹	Ivanpah Valley, CA	Solar Partners I, LLC	The ISEGS Project is a 370MW concentrated solar electrical generating facility. The project consists of three power plants, Ivanpah 1, Ivanpah 2 and Ivanpah 3. Shared facilities include a substation and natural gas pipeline. The three independent power plants and shared substation will be co-located on approximately 3,671 acres of BLM lands.	Solar	All three facilities are currently under construction. The first plant, Ivanpah 1, is complete. Ivanpah 2 and 3 are scheduled to be completed in the fourth quarter of 2013.	<ul style="list-style-type: none"> - Construction Impact: Aesthetics; Air Quality; Biology; Cultural; Human Health/Hazards; Hydrology; Noise; Recreation; Socioeconomics; Traffic - Operational Impact: Aesthetics; Biology; Land Use; Hydrology; Recreation
<u>6</u>	Ivanpah Valley Airport also known as the Southern Nevada Supplemental Airport (SNSA) ¹	Northwest of the ROW application area	Clark County	International Airport to supplement the McCarran International Airport in Las Vegas. The proposed project would be sited on 5,934 acres and includes a 17,000-acre Congressionally-designated Airport Environs Overlay District. <u>The project also includes three modified retention facilities for storm water and flood control, one of which is located in the Airport Environs Overlay District (Figure 4.19-2). The locations of the other two are described in Table 3.9-2.</u>	Airport	The FAA in cooperation with the BLM has suspended preparation of an EIS for this project. At this time, the FAA and BLM do not know when they will resume work on the EIS (FAA 2012). <u>Clark County has filed ROW applications with BLM for the modified retention facilities.</u>	<ul style="list-style-type: none"> - Construction Impact: Aesthetics; Air Quality; Biology; Cultural; Hydrology; Noise; Traffic - Operational Impact: Aesthetics; Air Quality; Biology; Noise; Traffic

Table 4.19-1. List of Projects Considered Within or Near the Ivanpah Valley (Continued)

<u>Number on Figure 4.19-1</u>	Project	Location	Owner	Project Description	Project Type	Status	Cumulatively Affected Resources
7	<i>XpressWest</i> Passenger Train Project ¹	Along the I-15 between Victorville, CA and Las Vegas, NV	DesertXpress Enterprises	Installation of 185 miles of train tracks for a commercial high-speed electric train that would operate between Victorville, California and Las Vegas, Nevada. Construction Commencement Date <u>is unknown pending funding</u>	High Speed Train	The Federal Railroad Administration (FRA), in cooperation with the BLM, Surface Transportation Board, Federal Highway Administration, and the NPS, with the added participation of the California Department of Transportation (Caltrans) and NDOT, prepared a Draft EIS in March 2009, Supplemental DEIS in August 2010, and Final EIS in March 2011. The FRA issued a ROD on the DesertXpress High-Speed Passenger Train project on July 8, 2011. <u>The project name has since been changed to XpressWest, with plans for additional rail segments. As of July 2013, Federal loan funding was withdrawn and the status of the project is unknown.</u> Construction start date unknown.	<p>– Construction Impact: Aesthetics; Air Quality; Biology; Cultural; Human Health/HazMat; Hydrology; Land Use; Noise; Socioeconomics; Traffic</p> <p>– Operational Impact: Aesthetics; Air Quality; Biology; Cultural; Human Health/HazMat; Noise; Traffic</p>
8	Joint Port of Entry (CA-690-EA06-01) ¹	Between Yates Well Road and Nipton Road, San Bernardino County.	Caltrans, California Dept Food and Agriculture	The state of California is proposing to construct and operate a Joint Port of Entry (JPOE) on I-15 located in the Ivanpah Valley, southwest of Primm, Nevada. The JPOE will include an Agricultural Inspection Facility and a Commercial Vehicle Enforcement Facility. Upon completion of the project, all traffic entering California on the southbound I-15 will be diverted through the JPOE	Inspection Facility	A Decision Record approving the JPOE project was issued on November 9, 2011. A Notice of Proposed Realty Action was published in the Federal Register on February 10, 2010 addressing the site’s suitability for classification for lease and subsequent conveyance under the provisions of the Recreation and Public Purposes Act. <u>As of July 2013, construction has not begun.</u>	<p>– Construction Impact: Aesthetics; Air Quality; Cultural; Geology; Noise; Traffic</p> <p>– Operational Impact: Aesthetics; Traffic</p>

Table 4.19-1. List of Projects Considered Within or Near the Ivanpah Valley (Continued)

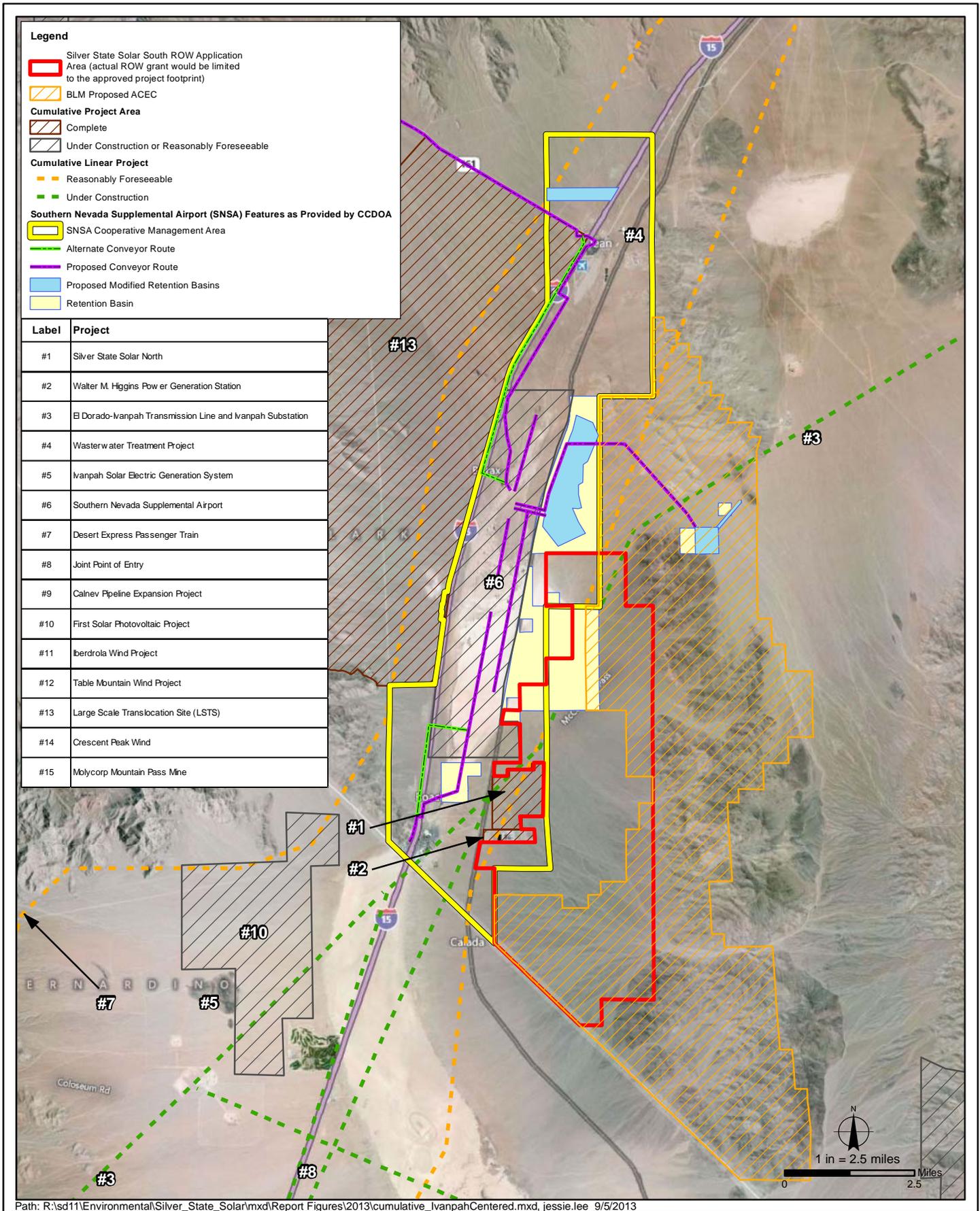
<u>Number on Figure 4.19-1</u>	Project	Location	Owner	Project Description	Project Type	Status	Cumulatively Affected Resources
<u>9</u>	Calnev Pipeline Expansion Project ¹	Parallel and adjacent to UPRR in this area	Kinder Morgan	Calnev Pipe Line, LLC (Calnev), operating partnership for Kinder Morgan Energy Partners, LP, proposes to add an additional refined petroleum products pipeline in California and Nevada, in order to expand the capacity of the Calnev Pipeline System. The Calnev Pipeline Expansion Project would involve the construction, operation, and maintenance of a new 16-inch-diameter pipeline and ancillary facilities from an existing facility in Colton, California to an existing facility in Las Vegas, Nevada. The proposed pipeline would parallel two existing system pipelines for most of the route.	Petroleum Product Pipeline	Notice of Availability of the Draft EIR/EIS was published in the Federal Register on March 23, 2012. A 90-day public comment period followed the publication. <u>The Final EIR/EIS is currently under preparation.</u>	<p>– Construction Impact: Aesthetics; Air Quality; Biology; Cultural; Human Health/HazMat; Hydrology; Soils; Noise; Socioeconomics; Traffic</p> <p>– Operational Impact: Air Quality; Human Health/HazMat; Hydrology; Soils; Traffic</p>
<u>10</u>	First Solar Photovoltaic Project (BLM ROW CACA 48669) ¹	Located 5 miles southwest of Primm, in western Ivanpah Valley, east of I-15. The project is located in California.	Desert Stateline, LLC, a wholly owned subsidiary of First Solar Development	Desert Stateline proposes to develop and construct the 300-MW Stateline Solar Farm. The solar farm, the corridor for the project’s 220-kV gen-tie transmission line, and the access road would be The proposed project would include the solar farm, an on-site substation, the 220-kV gen-tie line within the Utility Corridor, and an access road. The project would connect to the SCE regional transmission grid via SCE’s Ivanpah Substation. First Solar has proposed two alternative configurations. Their Alternative A would encompass 2,150 acres and their Alternative B would consist of 1,900 acres.	Solar Photovoltaic Plant	<u>A Draft EIR/EIS was released on 11/23/12. The Final EIR/EIS is currently under preparation. Joint BO by USFWS addresses the effects of this cumulative project and the proposed Project.</u>	<p>– Construction Impact: Aesthetics; Air Quality; Biology; Cultural; Human Health/HazMat; Hydrology; Noise; Recreation; Socioeconomic; Traffic</p> <p>– Operational Impact: Aesthetics; Biology; Land Use; Hydrology; Recreation</p>
<u>11</u>	Iberdrola Wind Project (BLM ROW CACA 44988) ¹	12 miles southwest of Primm, Nevada in California	Iberdrola Renewables	75-MW wind energy project 2,330 acres	Wind	ROW issued for 3 meteorological towers expired 12/31/09	<p>– Construction Impact: Aesthetics; Air Quality; Biology; Cultural; Human Health/HazMat; Hydrology; Land Use; Noise; Recreation; Socioeconomic; Traffic</p> <p>– Operational Impact: Aesthetics; Biology; Cultural; Hydrology</p>

Table 4.19-1. List of Projects Considered Within or Near the Ivanpah Valley (Continued)

<u>Number on Figure 4.19-1</u>	Project	Location	Owner	Project Description	Project Type	Status	Cumulatively Affected Resources
<u>12</u>	Table Mountain Wind Project (BLM ROW NVN-083041 and NVN-073726) ¹	Approximately 3 miles east of Sandy Valley, NV	Table Mountain Wind Co, LLC	Installation and operation of 10 meteorological towers on 11,570 acres to gather data for a potential wind generation site through 12/31/2010. Total project footprint approximately 30 acres.	Wind	ROW issued for 10 meteorological towers through 12/31/2010	<ul style="list-style-type: none"> - Construction Impact: Aesthetics; Air Quality; Biology; Cultural; Human Health/HazMat; Hydrology; Land Use; Noise Recreation; Socioeconomic; Traffic - Operational Impact: Aesthetics; Biology; Cultural; Hydrology
<u>Not shown</u>	Las Vegas RMP Revision	Las Vegas and Pahrump Field Office lands	BLM	Las Vegas RMP is being revised to consolidate guidance and update objectives and management actions for the public lands in the decision area.	RMP	Currently being updated. <u>A ROD is expected in late 2015.</u>	All resources may be affected by RMP amendment.
<u>Not shown</u>	Ivanpah Valley ACEC Designation	As much as 98,300 acres in Nevada and 31,079 acres in California	BLM responsible agency	Consideration of nomination of lands in Nevada and California to be designated as ACEC. <u>30,912</u> acres of this ACEC analyzed in this document as part of Alternative D, <u>and 31,859 acres are analyzed as part of the BLM Preferred Alternative.</u> Remainder would be analyzed cooperatively by BLM field offices in Nevada and California.	RMP Amendment	Pending	<ul style="list-style-type: none"> -Construction Impact: N/A - Operational Impact: Air Quality; Biological Resources; Lands and Realty; Special Management Areas; Mineral Resources; Soils; Recreation; Socioeconomics
<u>13</u>	<u>Large Scale Translocation Site</u>	<u>Southwest of Jean, NV, bordered to the north by Nevada Highway 161, by the Spring Mountains on the west.</u>	<u>USFWS</u>	<u>26,200-acre receiving site for tortoises translocated from development project areas and abandoned by pet owners. Has received approximately 9,000 tortoises and is at capacity.</u>	<u>Conservation</u>	<u>Ongoing</u>	<ul style="list-style-type: none"> -Construction Impact: N/A - Operational Impact: <u>Biological Resources; Lands and Realty; Special Management Areas; Mineral Resources; Soils; Recreation; Socioeconomics</u>
<u>14</u>	<u>Crescent Peak Renewables</u>	<u>Eastern edge of the Ivanpah Valley adjacent to the South McCullough Wilderness and California-Nevada Border</u>	<u>Crescent Peak Renewables, LLC</u>	<u>Up to 220 wind turbines with an output of up to 500 MW within a ROW application area of 37,740 acres. The total area of disturbance (including temporary disturbance) estimated to be 1,510 acres.</u>	<u>Wind</u>	<u>Pending</u>	<ul style="list-style-type: none"> -Construction Impact: <u>Aesthetics; Air Quality; Biology; Cultural; Human Health/HazMat; Hydrology; Land Use; Noise; Recreation; Socioeconomic; Traffic</u> - Operational Impact: <u>Aesthetics; Biology; Cultural; Hydrology</u>

Table 4.19-1. List of Projects Considered Within or Near the Ivanpah Valley (Continued)

<u>Number on Figure 4.19-1</u>	Project	Location	Owner	Project Description	Project Type	Status	Cumulatively Affected Resources
<u>15</u>	Molycorp Mine	Mountain Pass, approximately 5 miles south of Primm, Nevada in California	Molycorp, LLC	2,222-acre open pit rare earths mine	Mine	Existing	– Construction Impact: Construction Completed – Operational Impact: Air Quality; Aesthetics; Geology; Human Health/HazMat; Noise; Soils; Traffic; Recreation
Notes: In the absence of a known project name, projects are named according to the owner/developer and the type of facility or structure proposed. Sources: ¹ BLM. 2010. Final Environmental Impact Statement for the Silver State Solar Energy Project. DOI No. FES 10-50. Volume 1. September. ² Nevada Division of Environmental Protection. 2008. Fact Sheet (pursuant to NAC 445A.236). Available at: http://ndep.nv.gov/docs_08/nev87006_f08.pdf . Access on: 7 June 2012.							



**Cumulative Projects
in the Immediate Project Vicinity**

**FIGURE
4.19-2**

The approach to cumulative impacts of the proposed Project considers “past” or “existing” projects to be those that currently exist or have completed construction and are in operation. As explained in Chapter 3 and above, the impacts of past or existing actions are already reflected in the baseline conditions identified in Chapter 3. “Present” projects include those that are currently under construction or have been fully permitted such that they are likely to be part of the existing environment when the proposed Project would begin construction. “Reasonably foreseeable” future projects are those for which a formal permit application has been filed. The BLM considers an RFFA on BLM lands as a project for which a ROW application has been submitted. However, the identification of reasonably foreseeable project on BLM lands does not end there, it also considers the status of such projects, the availability of data for such projects, and whether or not the impacts of such projects are too speculative to be considered “reasonably foreseeable” based on the available information.

4.19.2 Cumulative Projects

4.19.2.1 Past and Present Actions

The majority of land surrounding the proposed Project footprint is Federal lands managed by the BLM LVFO. Past actions in the area include isolated mining exploration in the surrounding desert and mountains; commercial and residential development around the towns of Primm and Jean, including associated road and utility infrastructure construction and operation; and recreational opportunities in the surrounding desert and mountain areas.

Existing utility facilities in the Project vicinity include the Walter M. Higgins Generating Plant, the Silver State Solar North Project, various electrical distribution and high-voltage transmission lines, a petroleum products pipeline, and fiber optic and telephone lines. A brief description of past and present actions that may have additive effects when combined with the proposed Project is provided below.

Silver State Solar North Project

The Silver State Solar North Project, which was analyzed as Phase 1 in the 2010 Final EIS, became operational in May 2012. The project, on 618 acres, is designed to generate up to 50 MW_{AC} of solar-generated electricity to be sold to the Nevada market via a power purchase agreement with NV Energy. Power from the project is delivered into NV Energy’s existing electrical grid at the Bighorn Substation.

Potential impacts of the Silver State Solar North Project that may contribute to cumulative impacts include air quality and noise impacts during construction, reduction of groundwater volume, vegetation and habitat loss and fragmentation, impacts to desert tortoise populations, alteration of OHV routes on BLM land, degradation of the visual character of Ivanpah Valley, and adverse impacts to traffic load and LOS on I-15 (BLM 2010).

Walter M Higgins Generating Station (formerly called Bighorn Electric Generating Station)

NV Energy’s Walter M. Higgins Generating Station, a 530-MW natural gas-fired, combined cycle power plant, is located approximately 1 mile northeast of the center of Primm, Nevada, and adjacent to the proposed Project. The plant, originally named Bighorn Electric Generating

Station, went into service in 2004. The plant consists of two natural gas turbines, each equipped with a natural gas duct burner and auxiliary boiler, and a 500-horsepower diesel emergency generator. Unlike conventional power plants that use substantial amounts of water for cooling, the Higgins Station uses a six-story-high dry cooling system. Similar to a car radiator, 40 massive fans (34 feet in diameter) are used to condense the steam and cool plant equipment. In addition, the plant uses grey water from three neighboring casinos operations.

The presence of this facility has facilitated the growth of Primm, contributed to emissions and noise in the area, and removed natural habitat. The facility also draws on the local aquifer. The Generating Station has a Title V operating permit, and the maximum potential emissions for the facility in tons per year are 114.91 of PM₁₀, 157.91 of NO_x, 194.07 of CO, 10.52 of SO₂, 43.51 of VOC, 10.31 of HAP, and 230.30 of NH₃ (NDEP 2008).

Eldorado-Ivanpah Transmission Project (EITP)

The EITP provides the electrical facilities and capacity necessary to access and deliver power from renewable energy projects in the Ivanpah Valley. It included the construction of a new double-circuit 230-kV transmission line, approximately 35 miles long, between the existing Eldorado Substation in Nevada and the Ivanpah Solar Electric Generating System (ISEGS) project site. This transmission line replaced a portion of the existing 115-kV transmission line that runs from Eldorado through Baker and Mountain Pass. The EITP also includes an Ivanpah Substation at the ISEGS site and a sub-transmission line to connect to the existing 115-kV sub-transmission system in the area. The EITP also includes distribution lines to provide light and auxiliary power to the ISEGS and Ivanpah Substation. *The project was complete and operational in July 2013.*

Ivanpah Solar Electric Generating System (ISEGS) Project

In October 2010, the BLM issued a Record of Decision approving the construction, operation and maintenance, and termination (which includes decommissioning) of the proposed ISEGS project on public lands managed by the BLM Needles District Office. The proposed solar energy facility is currently under construction on approximately 3,470 acres of public lands in the eastern part of San Bernardino County, south of the Nevada/California boundary, west of I-15.

The ISEGS project consists of the development of three solar concentrating thermal power plants using fields of heliostats (elevated mirrors guided by a tracking system) to focus solar energy on boilers located on centralized power towers. Brightsource, the applicant, is developing the ISEGS project as three power plants in separate and sequential phases that are designed to generate a total of 370 MW of electricity. Ivanpah 1 will have an electrical generation capacity of 120 MW, and Ivanpah 2 and 3 will have a capacity of 125 MW each. The project also includes shared facilities consisting of a substation area, administration and maintenance buildings, contractor yards, and nursery for succulents and rare plants, and a linear ROW corridor 35 feet-wide and 3,911 feet long for construction of a natural gas pipeline and use of the existing Coliseum Road and Yates Well Road to access the project facilities. *As of August 2013, the project is 92 percent complete.*⁴

⁴ *Brightsource Ivanpah Website, August 26, 2013: <http://ivanpahsolar.com/blog>*

Wastewater Treatment Plant

The Nevada Department of Corrections operates a 240-bed conservation camp and the Southern Nevada Correction Center with a 600-bed capacity in the Jean area. These facilities are collectively referred to as the Jean Prisons. The Jean Prisons do not currently have a wastewater treatment facility, but the Gold Strike Hotel and Casino located nearby operates a wastewater treatment facility that may have the ability to treat the wastewater generated by the Nevada Department of Correction facilities.

To efficiently recharge effluent generated by the Jean Prisons, existing rapid infiltration basins located near the Jean Prisons needed to be upgraded. Under the terms of its Water Service Agreement with LVVWD and in conjunction with the prior approval of the Silver State Solar North Project, Silver State implemented a program whereby it will treat all of the waste water generated by the Jean Prison to “Class B” standards (as defined by the Nevada Department of Environmental Protection) and infiltrate the treated waste water back to the groundwater basin through the upgraded rapid infiltration basins. In addition, the Gold Strike Hotel and Casino’s wastewater treatment facility would also need to be upgraded to accommodate the additional wastewater stream. The project was completed in December 2012.

Large Scale Translocation Site (LSTS)

The LSTS near Jean, NV was established in 1997 to receive desert tortoises displaced by development activities in Clark County and abandoned by pet owners, and measures approximately 26,200 acres. It is bordered to the north by Nevada Highway 161, by the Spring Mountains on the west, and to the south and east by tortoise-proof fencing. Over 15 years over 9,000 tortoises have been transferred to the LSTS, and it is generally considered to be at capacity. The resident, wild tortoise density before translocation began was approximately 15–20 tortoises per square kilometer (USFWS, unpublished). The habitat of the LSTS is similar to the ROW application area: a Mojave Desert scrub plant community dominated by the creosote bush and white bursage association. LSTS construction included approximately 7.2 miles of new tortoise fence and installation of seven cattle guards, and the retrofitting of approximately 10 miles of existing fence along the I-15 right-of-way.

4.19.2.2 Reasonably Foreseeable Future Actions

Reasonably foreseeable future projects considered in this Supplemental EIS/PRMPA are shown on Figure 4-1, and are summarized below. Each of the projects was evaluated to determine if it is sufficiently defined (reasonably foreseeable) to be: (1) relevant to potential impacts, (2) within the Project area of influence, and (3) of a magnitude or duration that could potentially result in a cumulative impact.

Southern Nevada Supplemental Airport (SNSA)

The Clark County Department of Aviation proposes to construct the SNSA on 5,934 acres in the Ivanpah Valley in Nevada between Jean and Primm. The new airport would provide additional capacity to serve visitors to the metropolitan Las Vegas area and residents of greater Clark County, Nevada. It would not replace McCarran International Airport but would supplement the existing airport and serve Las Vegas.

In the Southern Nevada Public Land Management Act of 1998 (Public Law 105-263), as amended, the Ivanpah Valley Airport Public Lands Transfer Act of 2000 (Public Law 106-362), and Title V of the Clark County Conservation of Public Land and Natural Resources Act of 2002 (Public Law 107-282), Congress recognized the need for a supplemental commercial service airport to serve the Las Vegas metropolitan area and found that the Ivanpah Valley was the best location for a new airport. The Acts collectively authorized the sale of a 6,000-acre Airport Site to the CCDOA, identified a 17,000-acre Noise Overlay District for transfer to the CCDOA upon a final decision by the Federal Aviation Administration and BLM to approve the airport, and directed the BLM to establish a transportation and utilities corridor connecting the Las Vegas Valley to the SNSA site to provide for the utilities and transportation infrastructure needed to serve the airport. In addition; CCDOA has identified off-airport sites necessary for flood control infrastructure to be constructed to protect the SNSA. These sites are identified in right-of-way grant applications identified in Table 3.9-2.

The proposed Project intersects the 17,000-acre Ivanpah Airport Environs Overlay in the northwest corner of the Project site. *The proposed Project has been designed to minimize impacts to the Overlay or the SNSA. First Solar has worked closely with CCDOA to ensure that the Project and the proposed SNSA are compatible.* It is anticipated that portions of the ROW application area not required for the Project would be relinquished back to the BLM. *The ACEC proposed under Alternative D and in BLM's Preferred Alternative contains lands identified by the CCDOA as necessary for flood control infrastructure for the SNSA. In addition, the ACEC would directly abut the SNSA Airport Environs Overlay District defined by Congress in Public Law 107-282. Likely impacts of the construction and operation of the SNSA, as contemplated by Public Law 107-282, would include, among other things, noise impacts and construction of airport infrastructure, including flood control facilities.*

Planning of the SNSA has been considerably slowed due to the economic downturn and resultant decrease in air traffic at the McCarran International Airport. Accordingly, in 2010, the FAA suspended environmental work on the SNSA without identifying a date certain at which work would resume. As of *August 2013, ROW applications have been submitted to BLM for necessary storm water and flood control facilities. However, the precise location of any SNSA-related roadway, utility or other SNSA-related infrastructure would be subject to an approved Airport Final Environmental Impact Statement and Record of Decision and subject to compliance with the Endangered Species Act, 16 U.S.C. § § 1531-1544.*

XpressWest Rail Project

On November 18, the BLM released the Record of Decision authorizing a ROW grant to DesertXpress Enterprises, LLC to construct and operate a high-speed passenger rail line between Victorville, California and Las Vegas, Nevada on public lands. The passenger rail line would be a fully grade-separated, dedicated double track passenger-only railroad along a 200-mile corridor that would generally follow the route of I-15. The majority of the right-of-way would fall on previously disturbed lands and within existing energy production and utility corridors.

The project would also include construction of a passenger station in Victorville, California; a passenger station in Las Vegas, Nevada; a maintenance and operation facility in Victorville; an overnight maintenance and storage facility in the Las Vegas area; and associated ancillary facilities needed to maintain and operate the proposed rail line.

The Federal Railroad Administration, in cooperation with the BLM and the National Park Service, prepared an EIS to analyze the site-specific impacts of the proposed project on air quality, biological resources, cultural resources, water resources, geological resources and hazards, hazardous materials handling, land use, noise, and visual resources. The Federal Railroad Administration issued its Record of Decision on July 8, 2011.

The construction date for this project is unknown. The Federal Railroad Administration estimates that the project would create more than 45,000 construction-related and 722 permanent operational jobs. Approximately 821 acres of public land are needed for the permanent right-of-way. An additional 95 acres would be needed for temporary construction use. The project also includes about 2,800 acres of private land.

Possible impacts of the XpressWest project that may contribute to cumulative impacts include collisions with local animals (including representatives of sensitive species such as the desert tortoise), public safety impacts, surface hydrology impacts, and possible air quality impacts, during both the construction and operation phases.

I-15 Joint Point of Entry

The State of California, acting through the California Department of Transportation (Caltrans), filed an application for the Joint Port of Entry (JPOE) project, which would be on 133 acres of public lands managed by the BLM Needles Field Office. The proposed JPOE inspection facility would be comprised of a commercial vehicle enforcement facility and an agricultural inspection facility between Nipton Road and Yates Well Road on southbound I-15, located in the Ivanpah Valley, just south of the California-Nevada State line. The Commercial Vehicle Enforcement Facility would be in operation 24 hours a day, seven days a week with the primary focus on inspection of vehicle equipment and loads. The Agricultural Inspection Facility would consist of six passenger vehicle and four truck lanes through the inspection facility. Upon completion of the project, all traffic entering California on southbound I-15 would be diverted through the JPOE. A decision record was issued on November 9, 2011. As of September 2013, construction has not begun.

This project may contribute to cumulative impacts to aesthetics and visual resources, air quality (short-term), cultural, geology, noise, and transportation and traffic.

Kinder Morgan Calnev Pipeline Expansion Project

Calnev Pipe Line, LLC (Calnev), an operating partnership for Kinder Morgan Energy Partners, LP, proposes to replace and expand its refined petroleum products pipeline on the existing Calnev system. The 16-18 inch diameter, subsurface pipeline would run between the existing North Colton Terminal in the City of Colton, San Bernardino County, California, to Bracken Junction, located about 1.5 miles west of McCarran International Airport in the City of Las Vegas, Clark County, Nevada. In addition to pipeline construction, the project would require construction of tie-ins, laterals, a new pump station, a new junction, an electric substation, and upgrades to components of the existing Calnev system. Project construction is anticipated to be carried out within a 100-foot-wide ROW (BLM 2012b). Pipeline startup had been previously projected for late 2009 or early 2010, but the project currently remains in the Draft EIR/EIS stage of environmental analysis. A Notice of Availability of the Draft EIS/EIR was published in

the Federal Register on March 23, 2012. *Public comments were accepted until July 6, 2012, and the Final EIS/EIR is under preparation.*

This pipeline project may contribute to cumulative impacts to air quality, noise, hydrology, soils, and traffic during the construction phase and hazards impacts in the case of rupture and/or explosion during the operation phase.

4.19.2.3 Other Actions to be Considered

Pending Bureau of Land Management Solar and Wind Energy Projects

The BLM has received more than 300 applications for ROW authorizations for utility-scale solar facilities on BLM-administered lands throughout the southwest. As of May 12, 2012, the BLM had 78 pending applications for ROW authorizations for solar facilities (BLM 2012a). The total acreage of BLM-administered lands under pending applications is approximately 626,000 acres. In Nevada as of September 6, 2013, there are 13 pending applications for ROW authorization on approximately 146,342 acres. There is one pending solar ROW application near the proposed Project that is currently under NEPA review, the Stateline Solar Farm project, which is described below.

The BLM manages 20.6 million acres of public lands with wind potential and has authorized some 200 ROWs for the use of public lands for wind energy site testing or development. Of these, 31 development authorizations have a total installed capacity of some 440 MW. As of February 2012, the BLM has 40 pending wind energy development applications with a potential capacity of over 7,000 MW. In Nevada, as of May 2012, there are two pending wind projects that would use a total of approximately 1,445 acres of land and produce approximately 350 MW of electricity. There is one pending wind ROW applications near the proposed Project that is currently under NEPA review. The proposed site for the Table Mountain Wind Project is approximately 12 miles northwest of Primm, NV. There has been limited activity on this project since 2008. *The other proposed wind project is the Crescent Peak Wind project along the eastern edge of the Ivanpah Valley adjacent to the South McCullough Wilderness, which is described below and has not yet begun NEPA review.*

In addition, there are an unknown number of renewable energy development projects being proposed on private lands throughout the Southwest. Regional cumulative impacts could occur as a result of implementation of the proposed Project in conjunction with these solar, wind, or geothermal energy projects.

There are uncertainties in any large-scale, complex, and costly industrial project as it moves from concept toward realization. However, the level of uncertainties with some of the proposed renewable energy projects in the desert Southwest is unusually great. Cumulative analysis under NEPA requires consideration of the likelihood that the proposed projects actually will occur.

In addition, the proposed renewable energy projects, whether proposed on public or private land must successfully compete for Power Purchase Agreements with utility organizations that are working to meet their State-mandated Renewable Portfolio Standards.

Stateline Solar Farm

First Solar has requested a ROW authorization from the BLM Needles Field Office to construct, operate, maintain, and decommission a 300-MW_{AC} PV solar generation project in Riverside County, California. The Stateline Solar Farm project would be located on BLM-administered lands approximately 5 miles south of Primm, Nevada and would include access roads, PV arrays, an electrical substation, meteorological station, monitoring and maintenance facility, and a 2.3-mile generation tie-line on approximately 2,000 acres. The project also includes expansion of the Ivanpah Desert Wildlife Management Area would encompass the remaining desert tortoise habitat in California outside the footprints of the Stateline Solar Project, ISEGS, and the Primm Valley Golf Course; this expansion would add approximately 36 square miles to this conservation area. The desert wildlife management area would be contiguous with the ACEC proposed under the BLM Preferred Alternative and Alternative D at the state boundary east of Interstate 15. Because the USFWS consultation process for the Stateline Solar Farm project is occurring at generally the same time as that of the Project, USFWS has requested that consultation be “batched”, with a single BO addressing the effects of both projects). Refer to Chapter 5.2.3 Endangered Species Act Section 7 Consultation for more details on this process.

Crescent Peak Wind

Oak Creek Energy Systems filed a ROW application with the BLM on August 10 2006 to install meteorological towers to gather wind data for three years and reserve the land for possible future development. The ROW grant was issued on February 25, 2009. Currently the MET towers are installed. Recently, this applicant applied to the BLM to extend their wind-testing ROW grant for an additional 3 years. Depending upon the results of the wind data, this applicant may seek to develop a wind energy facility to be located within 34,456 acres southeast of the McCullough Range in Nevada near the California border. The total area of disturbance (including temporary disturbance) for the proposed project is estimated by Crescent Peak Renewables LLC to be 1,510 acres. Large areas of open, undeveloped land would exist between individual turbines to allow for free flow of wind. Water would be consumed for dust suppression during construction but there would be no operational water usage.

Pending Transmission Projects

Valley Electric Association (VEA) is proposing to upgrade its existing transmission lines in order to support the development of additional renewable resource generation facilities in Nevada. A Notice of Intent to prepare an EIS was published in the Federal Register on October 11, 2011, which was followed by a 60-day scoping period ending on December 12, 2011. The BLM is preparing an EIS to analyze VEA’s proposal, which includes construction of approximately 53.7 miles of new 500-kV single-circuit transmission line from VEA’s proposed 10-acre 230/500-kV Tap Substation to the existing Eldorado Substation in the Eldorado Valley; approximately 9.7 miles of new 230-kV single-circuit transmission line from the proposed Brightsource Hidden Hills Solar Project in Inyo County, California to the proposed Tap Substation; improvements to existing VEA facilities to accommodate the interconnections at VEA substations; installation of a buried 9.3 mile, 12-inch natural gas pipeline from the proposed solar plant in Inyo County, California to VEA’s existing 230-kV transmission; and installation of a 26 mile, 36-inch natural gas pipeline from its connection to the 12-inch line to the existing Kern River Gas Transmission pipeline. As of July 2013, Draft EIS preparation is on hold because Brightsource has suspended their permit application for the Hidden Hills Solar Project.

Programmatic Solar Environmental Impact Statement

The Office of Energy Efficiency and Renewable Energy, Department of Energy, and the BLM has prepared a Solar Programmatic EIS to assess environmental impacts associated with the development and implementation of agency-specific programs that would facilitate environmentally responsible utility-scale solar energy development in six western states (California, Arizona, Colorado, New Mexico, Nevada, and Utah). On December 17, 2010, the Notice of Availability of the Draft Solar Programmatic EIS was published in the Federal Register. Public comments were accepted through May 2, 2011, and more than 80,500 comments were received. The lead agencies analyzed the comments and made numerous adjustments to the Draft Programmatic EIS in response to the comments. A Supplemental Solar Programmatic EIS was issued on October 11, 2011, followed by a 90-day public comment period ending January 27, 2012. On April 20, 2012, the BLM released documents supporting its effort to establish a Solar Energy Program through the Solar Programmatic EIS. The documents are intended to be a framework for developing a Monitoring and Adaptive Management Plan, a draft framework for developing Regional Mitigation Plans, and an updated version of the proposed programmatic design features. *The Final Programmatic EIS for Solar Energy Development in Six Southwestern States was released on July 24, 2012, and the ROD was signed on October 12, 2012.*

The Supplemental Solar Programmatic EIS proposes incentives for solar developers who site projects in solar energy zones – offering reduced permitting times – and a sufficiently flexible variance process to allow development of well-sited projects outside of the zones. The BLM is continuing to process pending solar applications consistent with existing regulations and policies in the BLM’s recent Instruction Memoranda (IM 2011-060 and 2011-061), and current interagency coordination practices with Department of Interior agencies such as USFWS and National Park Service. The BLM defines “pending” applications as applications on file with the BLM before publication of the Supplement, including applications for lands with the proposed Solar Energy Zones filed before June 30, 2009.

RMP Revision for the Las Vegas and Pahrump Field Offices

The BLM’s Las Vegas and Pahrump Field Offices are revising their 1998 Las Vegas RMP. This plan revision will be focused on resource issues that need clarification or adjustment, and emerging issues not addressed in the current plan that need new decisions and management guidance. The planning area is located in southern Nevada and includes all public lands managed by the Las Vegas Field Office within Clark County and all public lands managed by the Pahrump Field Office in southern Nye County, outside the Air Force’s Nellis Test and Training Range.

Along with the RMP, an EIS will be developed as part of the planning process to understand the effects of land management actions on resources found within the Field Offices as well as to public land users. A Notice of Intent to prepare a revision of the RMP and conduct an EIS was published in the *Federal Register* on January 5, 2010. It is anticipated that the Draft RMP/EIS will be released *in 2015.*

Nomination of Ivanpah Valley ACEC

Basin and Range Watch nominated an ACEC to include a total of 129,379 acres in California and Nevada. The nominated area within Nevada is 98,300 acres. Basin and Range Watch identified their proposed ACEC as being important for several sensitive species. Their nomination states, “*The Ivanpah Valley contains an important habitat that supports a variety of*

rare and important species as well as important visual and cultural resources. The Ivanpah Valley is also undergoing pressure to develop various land uses. Golden Eagle, Western Burrowing Owl, Peregrine Falcon, chuckwalla and Gila monster occur here, as well as many rare plants from Nevada and California.”

To be eligible for designation as an ACEC, an area must meet the relevance and importance criteria described in 43 CFR 1610.7-2 and BLM Manual 1613.

The BLM is including in this Supplemental EIS/PRMPA analysis of 30,912 acres (Alternative D) or 31,859 acres (BLM Preferred Alternative) of this nominated ACEC that was determined by a BLM interdisciplinary team to meet criteria for both relevance and importance (refer to *Section 2.3.4 and Appendix B*). The remainder of the nominated area (approximately 98,000 acres in Nevada and California) will be assessed in coordination with applicable BLM California and Nevada offices in the LVFO RMP revision.

4.19.3 Cumulative Impacts Analysis by Resource

4.19.3.1 Air Quality and Climate

Air quality impacts resulting from the Proposed Action would affect a geographic extent consistent with the area described in the 2010 Final EIS. Cumulative impacts would be limited to construction emissions since the Project would have negligible operating emissions. Construction impacts would be localized and of short duration; therefore, the CESA for construction air quality impacts includes past, present, and reasonably foreseeable projects within 1 mile of the proposed Project. Emissions would be generated from the following sources in the area: the Walter M. Higgins Generating Station, the existing railroad, Silver State North, the EITP, and the Calnev Pipeline Expansion Project. Additionally, only projects that are scheduled concurrently in the same area as the proposed Project are considered as possible contributors to cumulative impacts. All contributions to climate change associated with the emission of GHGs are inherently cumulative in nature. The long-term GHG emissions for the Proposed Action are negligible and the Proposed Action would provide long-term generation of essentially emissions-free electricity. Most of the GHG emissions would be associated with construction activities, but when amortized over the lifetime of the Proposed Action these construction GHG emissions would not be cumulatively considerable. Therefore, cumulative GHG emissions impacts are not analyzed further.

Cumulative Impact Analysis

Cumulative impacts of the Proposed Action would be consistent with the cumulative impacts discussed in the Silver State Solar Energy Project 2010 Final EIS. Emissions would be localized to those locations under construction. Facilities such as the Walter M. Higgins Generating Station and the existing railroad are currently generating emissions, which are reflected in current ambient air conditions.

Construction of the reasonably foreseeable projects within the same airshed (i.e., hydrographic area air basins 164A and 164B) as the proposed Project and in nearby portions of California would generate similar types of emissions and could contribute cumulatively to impacts to air

quality. Table 4.19-2 provides the estimated daily emissions of the proposed Project and the other projects planned in the area for which data are available.

Table 4.19-2. Estimated Daily Emissions of the Proposed Project

Criteria Pollutant	Daily Emissions (lb/day)							Attainment Status of HAs 164A and 164B (Clark County, NV)
	EITP		Proposed Action	Brightsource/ ISEGS	Xpress-West	Calnev		
	CA ²	NV ³	NV ¹	CA	CA/NV	CA ²	NV ³	
CO	893	728	162	509	63	63	1,358	Attainment
NO _x	1,791	1,381	160	500	309	4,720	2,654	N/A ⁴
VOCs	209	159	22	63	30	515	325	N/A ⁴
SO ₂	8	11	2.3	2	<5	5	3	Attainment/ Unclassified
PM ₁₀	1,748	1,240	542	258	16	7,336	533	Attainment

Notes:

¹ Construction for this Project would only take place in Nevada

² Construction in the Mojave Desert Air Basin

³ Construction in Clark County

⁴ Area is designated as nonattainment for 8-hour ozone standard. NO_x and VOCs are ozone precursors

⁵ These calculations reflect maximum emissions during construction

Key:

CA = California

CO = Carbon Monoxide

HA = Hydrographic area

lb/day = Pounds per day

N/A = Not applicable

NO_x = Nitrogen oxides

NV = Nevada

PM₁₀ = Particulate matter with a diameter of less than 10 micrometers

SO₂ = Sulfur Dioxide

VOCs = Volatile organic compounds

Operation of the Southern Nevada Supplemental Airport would result in substantial new emissions from combustion of aviation gasoline and jet fuel, as well as from vehicle traffic to and from the airport; however, SNSA operation is not expected to be concurrent with Project construction. Both the cumulative projects and the proposed Project would result in daily emissions of CO, PM₁₀, VOCs and NO_x. The proposed Project's airsheds (Hydrographic Areas 164A and 164 B) are considered in attainment for CO and PM₁₀ criteria pollutants; however the airsheds are considered in attainment for O₃. Together, these projects would result in a cumulative impact to air quality.

If the proposed Project was constructed concurrently with one or all of the projects considered in this analysis, construction would result in a short-term, localized, and unavoidable impacts to air quality.

Cumulative projects and the proposed Project would result in displacement of OHV use from existing routes. These displaced OHV users would be expected to mostly use other existing nearby routes and potentially create some new routes. Increased use of existing routes could potentially widen them, resulting in increased localized fugitive dust emissions. Similarly, creation of new OHV routes where the terrain is currently vegetated or covered in cryptobiotic crust would also generate additional particulate emissions. However, this increase is expected to

be incremental over existing conditions and would not constitute a cumulatively considerable impact.

Alternatives

Alternatives C, D, and the BLM Preferred Alternative would cause fewer short-term air quality impacts than Alternative B due to their smaller areas of disturbance. Cumulative effects to air quality from displacement of OHV users would be similar to the proposed Project for Alternative C. The ACEC designated under Alternative D or the BLM Preferred Alternative would not be expected to substantially change the level of intensity of recreational uses within that 30,912-acre or 31,859-acre area. Therefore, cumulative effects to air quality from displaced OHV use under Alternative D or the BLM Preferred Alternative would also be similar to that described for Alternative B.

4.19.3.2 Noise

The only sensitive noise receptor in the CESA is the Desert Oasis apartment complex in Primm, NV. Development within 2 miles of the Desert Oasis complex could contribute to increases in ambient noise levels. The Proposed Action would have no adverse operational impacts from noise; therefore, only projects that could have concurrent construction periods are considered in this analysis.

Cumulative Impact Analysis

Construction of the Calnev Pipeline Expansion Project is estimated to begin in late 2014 at a rate of about two miles per day in the vicinity of Primm; therefore, its potential noise impact to the Desert Oasis apartment complex would be for one or two days. Calnev would implement site-specific noise mitigation measures, and its construction would have little or no overlap with that of the proposed Project. ~~Construction of the EITP (expected to commence in 2012) would produce noise that would impact residents of the Desert Oasis apartment complex. The apartments are located between 50 and 100 feet from the EITP, which would result in noise levels between 83 and 79 dBA, respectively, during construction.~~ The Desert Oasis apartment complex is separated from potential construction activities by an 8-foot solid concrete block wall. Typically, such a wall provides a minimum 5 to 10 dBA noise level reduction, provided it blocks the line of sight between the noise source and receiver. This would result in estimated construction noise levels between 69 and 78 dBA. The duration of noise exposure would be limited to approximately 1 month when construction would be occurring in the vicinity of the Desert Oasis complex. However, there is a potential for concurrent construction of these projects which could result in a cumulative noise impact to residents of the Desert Oasis apartment complex.

Noise generated by construction of the Proposed Action would not contribute to cumulative noise impacts at the Desert Oasis apartment complex due to the distance between that receptor and the proposed site relative to the distance between the apartment complex and the cumulative projects. Noise and vibration levels from the Proposed Action would be attenuated over distance and reduced to background levels at the closest sensitive receptor. Additionally, noise at any specific receptor is typically dominated by the closest and loudest equipment. If construction of the cumulative projects were concurrent with construction of the Proposed Action, the noise

levels generated by the cumulative projects would exceed and drown out noise produced by construction of the Proposed Action.

Alternatives

The cumulative impacts of Alternatives C, D, and the BLM Preferred Alternative would generally be consistent with those described for Alternative B.

The ACEC proposed under Alternative D and the BLM Preferred Alternative would require recreational users to remain on existing trails within that 30,912-acre or 31,859-acre area, but would not be expected to substantially change the level of intensity of recreational uses. As would be the case for Alternative B, other RFFA would occur remote from the Project and noise effects on sensitive receptors would not be additive. Therefore, cumulative effects to noise from displaced OHV use under Alternative D or the BLM Preferred Alternative would also be similar to that described for Alternative B.

4.19.3.3 Geology, Topography, and Geologic Hazards

The CESA for impacts to geology, topography and geologic hazards would be limited to projects in the Ivanpah Valley. Cumulative impacts to geology would be minimal because the Proposed Action would result in minor changes to geologic units or topography and, therefore, would not contribute substantially to cumulative impacts to geology and topography. The grading required for the Project would be minimized through the use of “disk and roll” techniques whereby the existing contours would be preserved over the majority of the site. Conventional grading would be limited to the access roads, concrete equipment foundations (e.g., solar field and substations), and laydown areas.

Cumulative Impact Analysis

Geologic hazards (such as ground shaking, earthquake-induced ground failure, and fault rupture) from the local and regional faults are impacts of the geologic environment on individual projects and would not introduce cumulatively considerable impacts.

Alternatives

The effects on geologic resources from Alternatives C, D, and the BLM Preferred Alternative would be similar to that of the Proposed Action because the alternatives would be located within the same proximity to regional faults and on the same geologic unit. Additionally, Alternatives C, D, and the BLM Preferred Alternative would be similarly designed to minimize alterations to topography. Therefore, cumulative direct impacts to geology, topography, and geologic hazards for Alternatives C, D, and the BLM Preferred Alternative would be less than substantial.

The ACEC proposed under Alternative D and the BLM Preferred Alternative would require recreational users to remain on existing trails within that 30,912-acre or 31,859-acre area. This would result in an unknown level of indirect reduced impacts to topography in the ACEC as compared to Alternative B and C, because creation of new trails in this area would be more restrictive. The expansion of the desert wildlife management area under the Stateline Solar Project could also restrict informal OHV use in that area. Therefore, cumulative effects to geology, topography and geologic hazards from displaced OHV use under Alternative D or the BLM Preferred Alternative would be somewhat less than that described for Alternative B.

4.19.3.4 Soil Resources

The CESA for impacts to soils would be limited to projects in the Ivanpah Valley. Ongoing and foreseeable development throughout the cumulative effects area for soils is dominated by proposed renewable energy projects. As shown in this document on Figure 4.19-1 and described in Table 4.19-1, additional renewable energy development is expected in the area. Other projects within the Ivanpah Valley that could contribute to cumulative effects include the EITP, the Southern Nevada Supplemental Airport, the Calnev Pipeline Expansion Project, the XpressWest rail line, the Stateline Solar Farm project, the Ivanpah Valley ACEC and the Jean Prison Wastewater Treatment Plant. The Southern Nevada Supplemental Airport project is still in the planning phase and, if built, would not be completed until 2020; therefore, it could only contribute to impacts during Project operations. The Ivanpah Valley ACEC would have beneficial impacts to soil resources *by restricting large site-type development and limitations on construction of new roads and trails within the designated ACEC.* The other projects could have overlapping construction schedules; therefore, they could contribute to cumulative impacts during Project construction, as well as during operations.

Cumulative Impact Analysis

Of the projects that exist or are currently under construction, approximately 4,339 acres of soils have been disturbed. If all reasonably foreseeable cumulative projects including Alternative B of the proposed Project are built, an additional 15,061 acres of soils would be disturbed. This acreage is based on the ROW applications for these projects and is likely an over-estimation of the final disturbance acreage, as undisturbed area is often left within a ROW.

Ground disturbance could impact biological soil crusts in the areas that are graded or vegetation is removed. This is an unavoidable consequence of ground disturbance in this type of environment. Cumulative projects taking place in the Ivanpah Valley would also result in the destruction of biological soil crusts where ground disturbing activities take place. The combined acreage of all cumulative projects would result in a cumulative impact to biological soils in the Ivanpah Valley.

Cumulative projects and the proposed Project would result in displacement of OHV use from existing routes. These displaced OHV users would be expected to mostly use other existing nearby routes and potentially create some new routes. Increased use of existing routes could potentially widen them, resulting in increased localized impacts to soil erosion and loss of cryptobiotic crust. However, this increase is expected to be incremental over existing conditions and would not constitute a cumulatively considerable impact.

All other foreseeable construction projects in the cumulative effects area for soils would also be required by law to implement similar control measures to prevent erosion. However, the total area affected by the other foreseeable projects would contribute to an overall cumulative impact to soil resources over the life of the Project. On a local scale, the cumulative effects could be large given the amount of vegetation clearing and grading; however, on a broader regional basis,

the cumulative impact would not be considerable, amounting to an effective loss of more than 15,000 acres², of which about 3,881 acres would be the result of the proposed Project.

Alternatives

Alternatives C, D, and the BLM Preferred Alternative would produce cumulative effects on soils similar to those described in Alternative B, with the exception of the flood control system. Alternative C would involve several diversion berms (each 10 feet high), debris basins, and level spreader detention basins, and would disturb an area of 2,546 acres. Alternative D would involve detention basins and drainage channels, and would disturb an area of 3,110 acres. This decrease in the number of disturbed acres for Alternatives C and D would incrementally reduce the cumulative effects to soils described for Alternative B. The BLM Preferred Alternative would control drainage by detention basins and associated drainage channels, similar to Alternative D, and would disturb a smaller area at 2,427 acres. Cumulative effects to soils from displacement of OHV users under Alternative C would be similar to Alternative B.

The ACEC proposed under Alternative D and the BLM Preferred Alternative would require recreational users to remain on existing trails within that 30,912-acre or 31,859-acre area. This would result in an unknown level of reduced impacts to soils as compared to Alternative B and C, under which creation of new trails in this area would be less restrictive. The expansion of the desert wildlife management area under the Stateline Solar Project could also restrict informal OHV use in that area. Therefore, cumulative effects to soils from displaced OHV use under Alternative D or the BLM Preferred Alternative would be somewhat less than that described for Alternative B.

4.19.3.5 Water Resources/Hydrology

The CESA for hydrology and water quality includes the watersheds and subwatersheds of the Ivanpah Valley. Ongoing and foreseeable development throughout the cumulative effects area for hydrology and water quality is dominated by proposed renewable energy projects (as shown in Figure 4.19-1 and described in Table 4.19-1). Other projects within the watersheds that could contribute to cumulative effects include the EITP, the Southern Nevada Supplement Airport, the Calnev Pipeline Expansion, the XpressWest rail line, Stateline Solar Farm project, the Ivanpah Valley ACEC and the Jean Prison Wastewater Treatment Plant. The airport is still in the planning phase and, if built, would not be completed until 2020.

The Ivanpah Valley ACEC would have beneficial impacts to water resources and hydrology through restriction of large site-type development and limitations on construction of new roads and trails within the designated ACEC. Only operational impacts from the proposed Southern Nevada Supplement Airport would contribute to cumulative hydrologic impacts. The other projects could have overlapping construction schedules; therefore, they could contribute to cumulative impacts during Project construction. These projects may include the XpressWest rail line, EITP, CalNev Expansion Project, and other solar projects listed in Table 4.19-1.

² This is based off of acreages available for cumulative projects (Silver State North, EITP, ISEGS, Southern Nevada Supplement Airport, XpressWest rail line, Desert Stateline Solar Project, and the Iberdrola and Table Mountain wind projects). It would be expected that the actual amount of acreage disturbed would be higher than this estimation.

Cumulative Impact Analysis

Use of Groundwater

The proposed Project would use at least 600 acre-feet of water during the three-year construction period, with no more than 200 acre-feet used in any one year. Following construction, O&M water requirements would be 21 AFY for the proposed 30-year life of the Project. The source of this water would be from two wells drilled on the proposed Project site. The foreseeable solar projects within the Ivanpah Valley are shown in this document on Figure 4.19-1 and described in Table 4.19-1.

Within the cumulative analysis area, the foreseeable electrical transmission and solar projects³ would occupy over 10,700 acres, with up to 3,881 acres of disturbance from the proposed Project. The ISEGS and Silver State North are the only projects within the Ivanpah Valley that have completed environmental analyses; the Stateline Project has completed a Draft EIS. ISEGS, an almost 4,000-acre facility, has estimated that it would use 400 acre-feet of water during its four-year construction period (or approximately 100 AFY) and 77 AFY during operations. ISEGS would draw its water from two wells located close to its site (BLM and CEC 2009). Water requirements for Silver State North are estimated at about 21 AFY for the life of the project. Using 100 AFY per 1,000 acres as an estimate for dust control requirements, and assuming a comparable annual water usage per acre during construction of the foreseeable solar projects, these projects would need at least 500 AFY during construction.

As of 2009, the estimated perennial yield for Basin 164A was 700 AFY and the committed use as of 1992 was 2108 AFY (NDWR 2009, BLM 2010). Newer data on committed use in this Basin is not available. Without knowing the water sources for many of the foreseeable projects, it is not possible to assess the magnitude of the impacts; however, if all the water needed to support the foreseeable projects were drawn from the same water table, this would cause a cumulative impact. However, the water used for the proposed Project would be small in comparison to the withdrawal parameters from the LVVWD and would not alter groundwater volume within the local basins. Therefore, it would not contribute to a considerable cumulative impact under this criterion.

The proposed Project would result in less than 200 acres (0.3 square mile) of impervious surfaces. The proposed Project would be in the Ivanpah Valley groundwater basin which covers 637 square miles, which is largely undeveloped. The area covered by the impervious surfaces of the proposed Project would be less than 0.05 percent of these basins. There could be as many as 10,700 acres of new renewable energy facilities in the Ivanpah Valley, including the 3,881 acres that would be disturbed by the proposed Project, all built on previously undisturbed land. The other foreseeable projects could result in the construction of hundreds to thousands of acres of impervious or semi-impervious surfaces. This could result in substantial cumulative alteration of groundwater recharge locally. However, the area of new impervious surfaces of the proposed Project would be small in reference to the size of the recharge area and it would not alter groundwater recharge within the local basins, so it would not contribute considerably to the cumulative impact.

³ Projects included: Silver State North, EITP, ISEGS, First Solar Stateline Project, and the proposed Project.

Groundwater Quality

Although hazardous material spills can occur on any construction site, the Applicant would implement many programs and measures to reduce the potential for a spill and to address spills that occur. These include emergency release response procedures to address any potential release of hazardous materials. Since the proposed Project would store quantities of insulating mineral oil at the transformers, SPCC plans would be required.

All foreseeable construction projects would also be required by law to implement a SWPPP and would likely have the same type of hazardous materials management programs as the Applicant. All other foreseeable projects that would have aboveground oil storage capacity greater than 1,320 U.S. gallons, or completely buried oil storage capacity greater than 42,000 U.S. gallons, would be required by law to implement a SPCC plan. With successful implementation of the spill prevention measures, any release from either the proposed Project or any foreseeable project would have short-term and localized effects. Given the depth to groundwater in the area and the requirements for spill prevention and cleanup, considerable cumulative impacts to water quality would not be likely. Therefore, it is unlikely that there would be a substantial cumulative impact to water quality that would result in degradation of groundwater quality.

Surface Water Quality

The estimated total land disturbance from the proposed Project would be up to 3,881 acres. During construction of the proposed Project, the Applicant would implement the SWPPP and BMPs required by the BLM and USACE. This would help ensure appropriate erosion control measures were used during construction to potentially keep on-site or off-site siltation or erosion within acceptable limits.

All other foreseeable construction projects would also be required by law to implement a site-specific SWPPP and install appropriate BMPs to prevent erosion. Therefore, there would not be a considerable cumulative impact to erosion in the cumulative effects area.

Flooding Hazards

The Applicant conducted hydrologic modeling for the proposed Project site. Under proposed mitigation measures and APMs, the Applicant would design Project facilities to mitigate flood risk and take an adaptive management approach whereby flood risks would be reassessed throughout the life of the Project. The other foreseeable projects would be constructed on alluvial fans and alluvium on the valley floors, and other foreseeable projects would be required to take similar measures to reduce the potential adverse effects of flood events; therefore, the potential cumulative risks would be reduced. Construction of the Southern Nevada Supplemental Airport would reduce the size of the existing Roach Lake Playa lakebed from approximately 5.4 square miles to approximately 2.5 square miles, thereby raising the 100-year storm event base flood elevation in the remaining lakebed by 0.8 feet as compared with existing conditions. It is assumed that all foreseeable projects will perform the appropriate hydrologic modeling to site their facilities in the areas with lowest flood risk and their structures will be designed to accommodate a 100-year, 24-hour flood event. Therefore, there would not be a substantial cumulative impact to flood risks.

Jurisdictional Waters

The proposed Project (*Alternative B*) would not impact jurisdictional waters; thus it would not contribute to cumulative impacts to jurisdictional waters.

Alternatives

As noted in *Section 4.6*, the USACE identified a portion of *Alternative C* within the jurisdictional waters of the United States. As a result, *Alternative C* could cause a cumulative impact to jurisdictional waters when combined with other projects that could affect the Ivanpah Lake area, including ISEGS, XpressWest rail line, Stateline Solar Farm project, EITP, and Calnev Pipeline Expansion Project. Increased sedimentation and degraded water quality would be the primary cumulative impacts of these projects to jurisdictional waters. It is assumed that the other projects identified in the cumulative projects scenario would be required to adhere to similar requirements if the projects affect waters of the United States.

Alternative D would have direct impacts consistent with *Alternative B* and would not impact jurisdictional waters of the U.S. *Direct impacts from the BLM Preferred Alternative would be somewhat less than for Alternative B due to the reduced area of disturbance, and the BLM Preferred Alternative would also not impact jurisdictional waters of the U.S.*

The ACEC proposed under *Alternative D* and the BLM Preferred Alternative would require recreational users to remain on existing trails within that 30,912-acre or 31,859-acre area. This would result in an unknown level of indirect reduced impacts to water resources and hydrology in the ACEC as compared to *Alternative B* and *C*, because creation of new trails in this area would be more restrictive and related impacts to drainages could be reduced. The expansion of the desert wildlife management area under the Stateline Solar Project could also restrict informal OHV use in that area. Therefore, cumulative effects to water quality and hydrology from displaced OHV use under *Alternative D* or the BLM Preferred Alternative would be somewhat less than that described for *Alternative B*. Rights-of-way for construction and operation of the Southern Nevada Supplemental Airport (Airport) and associated facilities would be allowed in the ACEC, subject to an approved Airport Final Environmental Impact Statement and Record of Decision and subject to compliance with the Endangered Species Act, 16 U.S.C. § 1531-1544. These could include ROWs for proposed Modified Retention Facilities and other necessary flood control engineering. These structures could potentially result in cumulative impacts to water resources and hydrology, and would be subject to independent NEPA analysis and mitigation.

4.19.3.6 Biological Resources

Vegetation and Special Status Plant Species

The CESA for vegetation and special status plant species is defined as the Ivanpah Valley as confined by the Spring Mountains, Clark Mountains, Lucy Gray Mountains, and New York Mountains. This reflects the natural watershed boundaries and encompasses the local range of species that may be affected by the proposed Project and other projects.

Of the projects that exist or are currently under construction, approximately 4,339 acres of Mojave Desert vegetation has been lost or heavily disturbed. If all reasonably foreseeable

cumulative projects including Alternative B of the proposed Project were to be built, an additional 15,061 acres of Mojave Desert vegetation would be lost or disturbed. This acreage is based on the ROW applications for these projects and is likely an over-estimation of the final disturbance acreage, as undisturbed area is often left within a requested ROW.

The JPOE is likely to have little impact to vegetation as much of the area it is proposed to be constructed contains little to no vegetation. Additionally, the Calnev pipeline expansion is anticipated to result in minimal impacts to vegetation as it is located in a previously disturbed ROW. The Ivanpah Valley ACEC would have beneficial impacts to biological resources by reducing the types and extent of future ground-disturbing actions. All other cumulative projects are proposed to be constructed in previously undisturbed or mostly undisturbed areas.

It is assumed that all projects would utilize BMPs to minimize impacts to vegetation and to protect sensitive species. These BMPs would include salvage and transplantation of cactus, yucca, and sensitive species or seed collection from species unsuitable for transplantation. Biological monitoring to assist with protection of these species is likely to be required for all projects. All projects will be required to minimize the potential for the introduction and/or spread of noxious weeds.

The EITP is the only project which crosses known occupied habitat for the white-margined beardtongue. This project had biological monitors on site during ground-disturbing activities to minimize impacts to this species. No other projects considered in this cumulative analysis are known to potentially impact any special status species. It is assumed that any project within the range and potentially suitable habitat of a special status or listed species would conduct appropriate field surveys and implement mitigation measures as necessary to reduce impacts to special status and listed species.

Alternatives

Alternatives C, D and the BLM Preferred Alternative would have similar cumulative impacts to vegetation as Alternative B. Cumulative impacts to vegetation would be in proportion to the amount of acreage disturbed under each alternative, and thus would be least under the BLM Preferred Alternative.

Designation of the 30,192-acre ACEC under Alternative D or the 31,859-acre ACEC under the BLM Preferred Alternative would require the lands to be managed for the white-margined penstemon and desert tortoise and would reduce the amount of native vegetation that may be affected by future ground-disturbing actions. The ACEC would exclude large site-type ROWs (greater than 5 acres) and be considered a linear ROW avoidance area. However, ROWs for construction and operation of the SNSA and associated facilities would be allowed in the ACEC, subject to an approved Airport Final Environmental Impact Statement and Record of Decision and subject to compliance with the Endangered Species Act, 16 U.S.C. § § 1531-1544. The ACEC areas proposed under Alternative D or the BLM Preferred Alternative would encompass more than 13,000 acres of suitable habitat for the white-margined penstemon, which would benefit from reductions in the types and extent of future ground-disturbing actions. This ACEC designation would offset some of the adverse cumulative impacts of other projects on vegetation and special status plant species. However, displacing and concentrating recreational users to areas north of the ACEC could result in impacts to white-margined penstemon populations near Jean, NV. The expansion of the desert wildlife management area under the Stateline Solar

Project could also restrict informal OHV use in that area, reducing cumulative impacts to vegetation in the Ivanpah Valley south of the state line.

Wildlife and Special Status Wildlife Species

The CESA for wildlife and special status wildlife species is defined as the Ivanpah Valley as confined by the Spring Mountains, Clark Mountains, Lucy Gray Mountains, and New York Mountains. This reflects the natural watershed boundaries and encompasses the local range of species that may be affected by the proposed Project and other projects.

Of the cumulative projects that exist or are currently under construction within the CESA, approximately 4,339 acres of Mojave Desert vegetation providing habitat for wildlife and special status species, including the desert tortoise, has been lost or disturbed. Should the reasonably foreseeable cumulative projects including Alternative B of the proposed Project be built, an additional 15,061 acres of wildlife habitat would be lost or disturbed. This acreage is based on the ROW applications for these projects and likely does not reflect the final disturbance acreage.

The JPOE is likely to have little impact to wildlife as much of the area it is proposed to be constructed contains little to no vegetation and, thus, little to no habitat for wildlife species. Additionally, the Calnev pipeline expansion is anticipated to result in minimal impacts to vegetation as it is located in a previously disturbed ROW. All other cumulative projects are proposed to be constructed in previously undisturbed areas.

Through construction of these projects, habitat for desert tortoises and other wildlife species would become further fragmented and migration corridors could become compromised. The combination of the ISEGS and Stateline Solar Farm solar energy projects may greatly restrict desert tortoise movement on the western side of I-15 within the Ivanpah Valley.

Large-scale developments in the Ivanpah Valley and elsewhere within the range of the desert tortoise have resulted in the need to translocate desert tortoises found within project boundaries. Translocation of desert tortoises typically results in relatively high mortality in the translocated tortoises as well as the recipient population due to increased competition or disease transmission. Although the LSTS is designed to preserve undisturbed desert tortoise habitat for translocated individuals or those that cannot be released into the wild, natural movement patterns are further constrained west of I-15 as a result of the LSTS fencing. The total number of tortoises proposed to be translocated from cumulative projects, including the Project, is approximately 322 (BLM 2012a). The specific sites to which these tortoises would be translocated is not known at this time, but each project would be required to prepare a translocation plan that accounts for other past and present projects in the area. Ongoing research conducted with translocated desert tortoises and control populations will continue to provide information on methods to increase survival within translocated and recipient desert tortoise populations (Nussear et al 2012, USFWS 2011). However, translocation within the Ivanpah Valley will continue to have negative effects on desert tortoises as a result of all cumulative projects within suitable habitat. Through USFWS consultation and implementation of these translocation plans, cumulative impacts related to translocation would be minimized but would still occur.

All cumulative projects would temporarily impact wildlife species during construction as a result of vibration and noise disturbance. Further, increased traffic during construction would increase

the potential for collisions between wildlife and vehicles. This risk would be most prevalent during construction as the majority of the cumulative projects have limited site use for operation and maintenance. Two exceptions to this are the JPOE and the Southern Nevada Supplemental Airport. It is anticipated that these facilities would be suitably fenced to reduce the potential of wildlife-vehicle collisions. However, noise impacts would continue throughout the life of these projects. Visual, noise, and vibration disturbance as a result of aircraft take-offs and landings would likely alter the behavior of wildlife throughout the Ivanpah Valley. Bighorn sheep may avoid the mountains immediately surrounding the valley as would raptors that previously would have nested in the area.

It is assumed that all projects would utilize BMPs similar to those listed in *Section 4.7.2.4* to minimize impacts to wildlife and to protect sensitive species. Among the mitigation measures assumed to be implemented would be the requirement of biological monitors during ground-disturbing activities. Monitors would reduce the potential for direct loss of special status species, especially desert tortoise, due to crushing or vehicle impact. It is assumed that monitors would conduct clearance surveys prior to initiation of construction activities.

The Iberdrola, Table Mountain *and Crescent Peak* wind projects would have greater impacts to birds and bats than would the other cumulative projects. Large-scale wind turbines are known to result in frequent impacts with birds and bats. At this time, it is unknown as to what mitigation measures these projects intend to implement to minimize the potential injury or mortality of these species.

Alternatives

Alternatives C, D and the BLM Preferred Alternative would have similar cumulative impacts to wildlife as Alternative B. Cumulative impacts to most wildlife species would be in proportion to the amount of acreage disturbed under each alternative, and thus would be least under the BLM Preferred Alternative. Cumulative impacts to connectivity between desert tortoise populations in the Ivanpah Valley and neighboring valleys would be highest under Alternative B due to the narrow corridor width between the site boundary and the Lucy Gray Mountains. Alternatives C, D, and the BLM Preferred Alternative would have lower cumulative impacts to desert tortoises connectivity, but all action alternatives would contribute to reduced connectivity of desert tortoise populations individually and when combined with other reasonably foreseeable cumulative projects.

Designation of the *30,912*-acre ACEC under Alternative D *or the 31,859-acre ACEC under the BLM Preferred Alternative* would restrict OHV use to existing routes and would reduce the risk of collisions with desert tortoises and other wildlife. Avoidance of linear ROWs and exclusion of ROWs for large sites (over 5 acres) would limit the amount of proposed development within the Ivanpah Valley and reduce the potential for future habitat fragmentation for all wildlife. *The expansion of the desert wildlife management area under the Stateline Solar Project could also restrict informal OHV use in that area, reducing cumulative impacts to vegetation in the Ivanpah Valley south of the state line. However, ROWs for construction and operation of the SNSA and associated facilities would be allowed in the ACEC, subject to an approved Airport Final Environmental Impact Statement and Record of Decision and subject to compliance with the Endangered Species Act, 16 U.S.C. § § 1531-1544.* This ACEC designation would offset some of the adverse cumulative impacts of other projects on wildlife and special status animal species.

4.19.3.7 Cultural Resources

Over time, cultural resources are subject to slow degradation as cultures change, and archaeological and historical sites weather and erode. Prior development of various types of projects has degraded and destroyed cultural resources as well. Indirect impacts on cultural resources can result from degrading the setting of a historic property and incidental damage to cultural sites as a result of increased public access to previously inaccessible areas.

Unknown, unrecorded cultural resources may be found almost any development site. It is not known what, if any, cultural resources would be affected by development of all present and future projects within the area. However, it is reasonable to assume that cultural resources could exist and could be expected to be uncovered at some of these sites. As would occur during this Project, should cultural resources be discovered during the construction of current and future projects, they would be subject to legal requirements designed to protect them and reduce impacts.

Based on the location of the proposed Project and the results of the cultural resource study that was conducted, the potential for cumulative impacts to archaeological and historic sites as a result of the construction of this Project is considered to be low. The Project is located in an area with low site density which is currently accessible by the public. Because the region consists mostly of Federal land managed by the BLM, any future projects will be required to identify any historic properties that would be affected, and any adverse effects to cultural resources would be mitigated.

Site 26CK5180a is a historic transmission line that was constructed from the Boulder/Hoover Dam to Los Angeles. That site is not part of the Project ROI as it occupies its own ROW and would not be affected by construction or operation of the proposed Project. The transmission line was not formally evaluated for NRHP eligibility for this Project; however, it has been determined as eligible in other locations. The site was removed and replaced with upgraded lines as part of SCE's EITP between California and Nevada. That undertaking was the subject of the Eldorado to Ivanpah Transmission Project EIR/EIS with the California Public Utilities Commission as the lead CEQA agency and the BLM in California as the lead NEPA agency. Removal and upgrade of the line was determined to be an adverse effect which was resolved by documentation of the resource for the HAER.

Alternatives

Alternatives C, D and the BLM Preferred Alternative would have similar direct cumulative impacts to cultural resources as Alternative B, and would be considered low due to the site density in the area. The ACEC proposed under Alternative D and the BLM Preferred Alternative would require recreational users to remain on existing trails within that 30,912-acre or 31,859-acre area. This would result in an unknown level of indirect reduced impacts to surface disturbance within the ACEC as compared to Alternative B and C, because creation of new trails in this area would be more restrictive. This reduced surface disturbance could potentially reduce impacts on undiscovered cultural resources. The expansion of the desert wildlife management area under the Stateline Solar Project could also restrict informal OHV use in that area, reducing cumulative impacts to cultural resources in the Ivanpah Valley south of the state line. Therefore, cumulative effects to cultural resources from dispersed OHV use under Alternative D or the BLM Preferred Alternative would be somewhat less than that described for Alternative B.

4.19.3.8 Paleontological Resources

Since the paleontological analysis concluded that the Proposed Action would result in no impact to paleontological resources, there would be no cumulative impacts; however, mitigation measure **MM PALEO-1** would be implemented to ensure that, in the event significant subsurface paleontological resources are identified during construction, they would be addressed according to the stipulations of the BLM. Similar measures are typically required for other projects, limiting their potential impacts to paleontological resources.

Alternatives

The effects on paleontological resources from Alternative C, D, and the BLM Preferred Alternative would be the same as the Proposed Action in that there would be no cumulative impacts.

4.19.3.9 Lands and Realty

The CESA for lands and realty is the Ivanpah Valley. Land use policies and plans within the CESA which could be cumulatively affected by the proposed Project and other projects within the CESA include management policies of the Jean/Roach Lake and Ivanpah Dry Lake SRMAs. Projects considered for the cumulative impact analysis which may contribute include the Silver State Solar North Project, EITP, the Stateline Solar Farm project, SNSA, XpressWest Passenger Train, Molycorp Mine, the LVFO RMP Revision, and Calnev Pipeline Expansion Project.

Cumulative Impact Analysis

The proposed Project may cumulatively affect existing land use policies and plans as it would restrict approximately 3,881 acres of land within the 216,300-acre Jean/Roach Lake SRMA. Currently, approximately 8,626 acres⁴ of existing or reasonably foreseeable projects would restrict recreation use in the Jean/Roach Lake SRMA, most notably the approximately 6,000-acre SNSA. Removing the acreage of the proposed Project from the Jean/Roach Lake SRMA through a LVFO RMP amendment would reduce the 229,155 acres⁵ of Jean/Roach Lake and Ivanpah Dry Lake SRMAs managed for recreation use. The LVFO is currently revising their RMP, which will consolidate guidance and update objectives based on resource issues that need clarification or adjustment. Revisions to the management objectives within Ivanpah Valley could further contribute to the cumulative effects.

Alternatives

Cumulative effects would be similar between alternatives B, C, D, and the BLM Preferred Alternative as all are located entirely within the SRMA. Differences between the alternatives include their acreages and footprint configurations. These are described in detail in *Section 4.11, Lands and Realty* of this document. Alternative D also includes the designation of a 30,912-acre ACEC and the BLM Preferred Alternative includes a 31,859-acre ACEC, which would exclude large site-type ROWs (greater than 5 acres) and be considered a linear ROW avoidance area.

⁴ Projects included: Silver State Solar North, El Dorado Ivanpah Transmission Line, Molycorp mine, and Ivanpah Valley Airport

⁵ Jean/Roach Lake and Ivanpah Dry Lake SRMAs

However, ROWs for construction and operation of the SNSA and associated facilities would be allowed in the ACEC, subject to an approved Airport Final Environmental Impact Statement and Record of Decision and subject to compliance with the Endangered Species Act, 16 U.S.C. § § 1531-1544. While the designation would not affect current ROWs nor those associated with the proposed SNSA, it would restrict and/or limit future development within the ACEC.

4.19.3.10 Special Management Areas

The CESA for the proposed Project's contribution to cumulative impacts to SMAs is the Ivanpah Valley. Potential cumulative impacts to SMAs in the Ivanpah Valley include Jean/Roach Lake and Ivanpah Dry Lake SRMAs, Ivanpah DWMA, Mojave National Preserve, and South McCullough Wilderness. Potential cumulative impacts to the Jean/Roach Lake and Ivanpah SRMAs are described in *Section 4.19.3.9, Lands and Realty*, above. As discussed in *Section 4.10, Special Management Area*, potential impacts to the other SMAs would be mitigated and would therefore not contribute to cumulative impacts.

Alternatives

Under alternatives, B, C, and D, the BLM would amend the LVFO RMP to remove the Jean/Roach Lake SRMA designation and change the VRM Class III to Class IV within the Project footprint. BLM is also revising the LVFO RMP, through which they will consolidate guidance and update objectives based on resource issues that need clarification or adjustment. Based on the increase in energy, transportation, and industrial development in Ivanpah Valley, the BLM may adjust the management objectives in the area which may increase cumulative effects to SMAs.

Designation of a 30,912-acre ACEC under Alternative D or a 31,859-acre ACEC under the BLM Preferred Alternative may also increase cumulative effects to SMAs by increasing restrictions on recreation within these areas. These additional restrictions could displace OHV riders to areas outside of the ACEC, and potentially to other SMAs within the CESA. The expansion of the desert wildlife management area under the Stateline Solar Project could also restrict informal OHV use in that area and displace riders to other SMAs. It is impossible to predict with any certainty the areas to which displaced OHV riders will relocate, however this displacement could increase adverse effects to sensitive resources within SMAs within the Ivanpah Valley.

4.19.3.11 Recreation

The CESA for recreation is defined as the Ivanpah Valley. The analysis considers the recreation activities within the valley and the potential projects which would restrict or change recreation uses or conflict with current management plans or policies. The proposed Project is located entirely within the 216,300-acre Jean/Roach Lake SRMA. The SRMA is managed by BLM "for intensive recreation opportunities, including competitive off-road vehicle (in accordance with the USFWS BO) and other recreation events, as well as dispersed recreation use and commercial activities". Although OHV use is allowed in other areas within the Eldorado Valley, this SRMA is the only public land within Ivanpah Valley which is managed specifically for intensive OHV use, and is used regularly by competitive OHV event organizers. While the Ivanpah Dry Lake SRMA is located immediately south of the Jean/Roach Lake SRMA, it is not managed for OHV use, instead it is managed for non-motorized vehicles. Projects considered for the cumulative

impact analysis which may contribute to recreational impacts include the Silver State Solar North Project, EITP, SNSA, XpressWest Passenger Train, and Calnev Pipeline Expansion Project. These projects are located within the Jean/Roach Lake SRMA and would restrict OHV use within their footprints and displace existing recreational users to other areas.

Cumulative Impact Analysis

Alternatives B would restrict OHV use within 3,881 acres of the Jean/Roach Lake SRMA. When considered cumulatively with the 8,626 acres⁶ of other projects, up to 6 percent of the Jean/Roach Lake SRMA would be restricted from OHV use. The proponent has committed to allowing access to the Lucy Gray Mountains through the use of their Project access road, located outside of the perimeter fence, which would allow the organized competitive OHV organizers to apply for recreational use permits with similar race courses used in the past.

BLM is also revising the LVFO RMP, through which they will consolidate guidance and update objectives based on resource issues that need clarification or adjustment. Based on the increase in energy, transportation, and industrial development in Ivanpah Valley, BLM may adjust the management objectives in the area which may further restrict, or allow more OHV use in Ivanpah Valley.

Alternatives Analysis

Similar to Alternative B, Alternatives C, D, and the BLM Preferred Alternative would all restrict (to varying degrees) OHV use within the Jean/Roach Lake SRMA. The footprints of these facilities are 2,546 acres, 3,110 acres, and 2,427 acres respectively and each configuration is slightly different.

The designation of a 30,912-acre or 31,859-acre ACEC under Alternative D or the BLM Preferred Alternative, respectively, would place additional restrictions on recreation within the Ivanpah Valley. The expansion of the desert wildlife management area under the Stateline Solar Project could also restrict informal OHV use in that area. These additional restrictions could displace OHV riders to areas outside of the ACEC. The recreational carrying capacity of these outside areas is not known, and it is possible that the displacement and resulting increase in use could reduce the quality of recreational experiences.

4.19.3.12 Visual Resources

Impacts resulting from construction, operation, maintenance, and decommissioning of the proposed Project could result in a cumulative effect on visual resources in combination with other past, present, or RFFA within the Ivanpah Valley. The geographic scope for the analysis of the proposed Project's contribution to cumulative impacts to visual resources includes all projects within the Ivanpah Valley. Existing projects within the same viewshed as the proposed Project include Silver State Solar North, Walter M. Higgins Power Generation Station, EITP, Ivanpah Substation, a wastewater treatment plant near Jean, and the ISEGS. The RFFAs within the same viewshed as the proposed Project include the proposed Southern Nevada Supplemental Airport, XpressWest rail line, JPOE, Calnev Pipeline Expansion project, First Solar's Stateline Solar

⁶ Includes: Silver State Solar North Project, EITP, SNSA, XpressWest Passenger Train, and Calnev Pipeline Expansion Project.

Farm project, and the Table Mountain Wind project. The BLM LVFO is currently revising their 1998 Las Vegas RMP which will also affect visual resources within the Ivanpah Valley.

The RFFAs within the Ivanpah Valley would have similar visual effects as compared to the proposed Project (i.e., introduced contrast would affect scenic quality and sensitive viewers) and would modify the landscape generally at a similar scale to the proposed Project, requiring clearing, grading, and additional structures/facilities. These projects, excluding the proposed Project, would occupy approximately 11,206 acres. However, the revision to the LVFO RMP, a RFFA, would affect how lands would be managed in terms of visual resources which may ultimately dictate future development for BLM lands within the Ivanpah Valley and adjacent mountain ranges. In this regard, development near the proposed Project has already altered the landscape setting of the Ivanpah Valley and generally includes I-15; the Walter M. Higgins Power Generation Station; several existing *high-voltage* transmission lines, corridors, and substation(s); the wastewater treatment plant in Jean, Nevada; and mixed-use development in Primm, Nevada. These developments have resulted in numerous man-made modifications to the natural landscape both on and off BLM-administered lands, thereby cumulatively increasing contrasts to the natural form, line, color, and texture of natural landscape features and supporting the proposed Project RMP amendment to reclassify the development site from VRM Class III to Class IV.

According to the latest VRI developed for the BLM Southern Nevada District Office (BLM March 2011), existing Scenic Quality units within the cumulative effects study area include Class C landscapes such as Ivanpah Valley, Eldorado Valley, Las Vegas Valley, and Sheep Mountain. Class B scenery within the study area include Mesquite Valley, Goodsprings Valley, Bird Spring, McCullough Range, Lucy Gray Mountains, and Spring Mountains. Current and future projects would incrementally modify the setting in a similar manner including introducing strong geometric lines and forms and removing substantial large blocks of vegetation. Therefore, the proposed Project in context with past, present and RFFAs would add incrementally to the industrial or developed landscape character within and adjacent to the Ivanpah Valley. The scenic quality for the lands in which the projects are being proposed, would be further degraded and therefore the intrinsic aesthetic value of affected landscapes would be substantially reduced.

Many of the projects being described in context with the cumulative effects analysis have, or would have the potential to result in adverse impacts to KOPs given the high visibility afforded by the *topography in the regional area* (Section 3.12.1, *Visual Character*). KOPs identified within the Ivanpah Valley are generally related to travel routes, recreation areas, special management areas, and residences as described in Section 3.12.3, *Key Observation Points*. Sensitivity levels potentially affected by past, present, and RFFA include moderate sensitivity travel routes and recreation areas such as I-15, SR 161, Cottonwood Valley Road, and Bird Spring. Recreation or visitor areas associated with high sensitivity include the McCullough Range and Goodsprings (historic mining/ghost town).

Existing development within the study area has resulted in landscape modifications which are viewed by travel route, recreation, and residential viewers; however, RFFAs would introduce additional landscape, vegetation, and structure contrast into the viewshed. Such RFFAs would therefore increase visual impacts to KOPs (e.g., travel routes, recreation areas, and residences) because form, line, color, and texture of existing features would become more dominant from these locations.

Designing proposed and future actions to reduce the amount of formal geometries typically associated with solar or wind fields, (i.e., instead of square blocks make them more irregular) and reducing soil contrast (which could mitigate long term dust and visibility issues) would assist to partially reduce cumulative effects that would occur as a result of the proposed Project's and pending projects' contribution to visual resource effects in this region.

Alternatives

Alternatives C, D, and the BLM Preferred Alternative would require a smaller footprint than Alternative B, but each would be located in the same area with the same VRI; therefore, cumulative impacts to visual resources associated with the Project development under Alternatives C, D, and the BLM Preferred Alternative would be similar to Alternative B. Each of the action alternatives would involve revision of the VRM within the Project footprint to a Class IV, but that change in classification would not generate any impacts beyond that of the proposed development. Designation of a 30,912-acre ACEC under Alternative D or 31,859-acre ACEC under the BLM Preferred Alternative would exclude large site-type ROWs (greater than 5 acres) and be considered a linear ROW avoidance area. These restrictions would further reduce cumulative impacts by limiting future development and landscape modifications within the Ivanpah Valley. However, ROWs for construction and operation of the SNSA and associated facilities would be allowed in the ACEC, subject to an approved Airport Final Environmental Impact Statement and Record of Decision and subject to compliance with the Endangered Species Act, 16 U.S.C. §§ 1531-1544.

4.19.3.13 Transportation/ Motorized Vehicle Access

Traffic impacts of the proposed Project would be limited to the regional freeways and local roads that comprise the local transportation network; therefore, the geographic area analyzed for cumulative traffic and transportation impacts is the road network within the Ivanpah Valley. The Proposed Action would potentially impact traffic and transportation systems by increasing the volume of traffic during the construction phase of the proposed Project. Because impacts to traffic and transportation would result primarily from construction-related activities, this analysis is limited to cumulative projects that would have concurrent construction schedules.

Ongoing and foreseeable development throughout the cumulative effects area for traffic and transportation is dominated by proposed renewable energy projects. As shown in this document on Figure 4.19-1 and described in Table 4.19-1, additional renewable energy development is expected in the area. Based on the number of projects planned for the area, it is reasonable to assume that some would be constructed concurrently with the Proposed Action. Other projects in the vicinity of I-15 that may be potentially constructed concurrently with the Proposed Action include the Calnev Pipeline Expansion Project, the EITP, and the XpressWest rail line.

Cumulative Impact Analysis

Most local roads in the CESA are infrequently used and would not be adversely affected by a temporary increase in road traffic. Construction of the proposed Project would increase use of I-

15 by a maximum of 860⁷ vehicle trips. Northbound I-15 experiences periods of heavy use on Friday from approximately noon to 10:00 p.m. due to motorists traveling between the Las Vegas and Los Angeles areas. The proposed Project, ISEGS, the Stateline Solar Farm project, the Calnev Pipeline Expansion Project, ~~the EITP~~, and the XpressWest high-speed rail project would all be located near the I-15 corridor. It is likely that during certain periods, construction of these projects would have overlapping schedules. **MM TRAN-1** requires the Applicant to develop a Traffic Management Plan, which would likely be required of the cumulative projects listed above. With concurrent construction, the number of vehicles using I-15 would increase and would adversely impact traffic load and LOS on I-15 on Fridays from noon to 10:00 p.m. The proposed Project would only contribute a maximum of 860 vehicle trips per day during the as yet unspecified height of construction activities and would minimize impacts through use of a Traffic Management Plan. However, the Proposed Action's incremental effect would result in a considerable cumulative impact to traffic on I-15 based on the current LOS and usage; therefore, mitigation would be necessary.

MM TRAN-1 will require the Applicant to limit the use of northbound I-15 on Fridays from noon to 10:00 p.m. This will require using alternative routes or planning sufficiently such that vehicular use of the I-15 off ramp would be limited to fewer than 15 vehicles every 15 minutes. Implementation of this mitigation measure would reduce the proposed Project's incremental contribution.

Alternatives

Alternatives C and D would require a smaller footprint than Alternative B. However, all would be located within the same ROW application area and would require the same road usage during construction; therefore, cumulative impacts associated with Alternatives C and D would be the same as the Alternative B. The BLM Preferred Alternative would be substantially smaller in size as compared to Alternative B, and would be constructed over a shorter duration. Therefore, the BLM Preferred Alternative would have reduced cumulative impacts to transportation as compared to Alternative B.

The designation of a 30,912-acre or 31,859-acre ACEC under Alternative D or the BLM Preferred Alternative, respectively, would place additional restrictions on recreational vehicle travel within the Ivanpah Valley. The expansion of the desert wildlife management area under the Stateline Solar Project could also restrict informal OHV use in that area. These additional restrictions could displace OHV riders to areas outside of the ACEC. The carrying capacity of trails in these outside areas is not known, and it is possible that the displacement and resulting increase in use could result in minor impacts to off-road transportation in these areas.

4.19.3.14 Human Health and Safety/Hazardous Materials

Impacts to hazards and hazardous materials caused by the Proposed Action would generally be limited to the proposed Project site and land directly adjacent to the site because impacts would result from incidents associated with hazardous materials during construction or maintenance activities. Cumulative impacts could generally occur during construction and operation and

⁷ This assumes the construction of the proposed Project would use the same number of workers as were proposed for the original Silver State Solar Energy Project.

would be limited to the areas of concurrent construction or maintenance. However, the potential displacement of recreational users associated with the Project and other cumulative projects could potentially bring incompatible recreational uses (e.g., shooting and OHV or hiking) together more frequently. These interactions would increase the likelihood of an accident resulting in injury or fatality.

Regarding cumulative environmental contamination impacts, the proposed Project's contribution to a cumulative impact would only be considered substantial if it combined with other projects generate contaminated soil that required off-site treatment and that, as a combined volume, exceeded the capacity of available treatment facilities or resulted in substantial exposure of hazardous materials to the public. For the reasons discussed below, the proposed Project would not contribute to considerable cumulative impacts.

Hazardous Materials, Spills, and Potential Exposures

Construction and operational activities associated with the Proposed Action could result in releases of hazardous materials in localized areas on the proposed Project site. The Applicant would implement a number of programs and measures to reduce the potential for a spill and to address spills that occur. Given the small quantities of materials to be used during construction and operations, any spill would be small and would be readily cleaned up using the Applicant's plans. Since any spills would likely be small, localized, and cleaned up, there would not be the potential for impacts of the proposed Project to combine with impacts of other projects, and there would not be a considerable cumulative impact.

There is currently no evidence to suggest that on-site soils or groundwater are contaminated, however, sampling and characterization has not been conducted and mining activity has been reported within the site boundaries. Because any soil contamination encountered would be removed and/or remediated prior to construction, impacts of the Proposed Action would not combine with impacts of other projects, and there would not be a considerable cumulative effect.

Fire Hazards

Wildfire risks during construction and operation are associated with the combustion of native materials due to smoking, refueling, sparks from welding, and operating vehicles and other equipment off roadways. Brushing activities for vegetation control and removal during construction could result also in fire. These risks would be associated with construction of the proposed Project and large foreseeable projects including ISEGS, Stateline Solar Farm project, XpressWest, and the Calnev Pipeline Expansion Project, ~~and the EITP~~. The Ivanpah Valley in California has a moderate fire risk. In Nevada, the fire risk outside of Primm is not known. The fire risk in the town of Primm is known through evaluation of adjacent, local fire history in Nevada and California. Primm may have high to extreme fire risk in the presence of a large annual grass fuel load, but it is likely to have low risk in the absence of annual grass fuels. Concurrent construction of the foreseeable construction in the vicinity could increase the fire risks due to construction activities, electrical infrastructure, and potential spread of non-native species that provide greater fuel loads. However, each project would likely implement its own fire management program to reduce the potential risk of fires. Therefore, there would not be a considerable cumulative impact.

Alternatives

Potential human health and safety effects that would result from the construction, operation, and decommissioning of Alternatives C, D, and the BLM Preferred Alternative would be as described for Alternative B due to the similarities in the construction and O&M practices for the four action alternatives.

The designation of a 30,912-acre or 31,859-acre ACEC under Alternative D or the BLM Preferred Alternative, respectively, would have minimal effects on human health and safety or hazardous materials, but would reduce the potential for future industrial development in the ACEC which could reduce the potential for release of hazardous materials.

4.19.3.15 Socioeconomics

The socioeconomic potential impacts of the proposed Project would be limited to the local and regional economy within the Ivanpah Valley and the local communities within that region; therefore, the geographic area analyzed for cumulative socioeconomic impacts is the local and regional economy and the local population within the Ivanpah Valley. *Section 4.15, Social and Economic Impacts* in the 2010 Final EIS and *Section 4.16* in the Supplemental EIS/PRMPA, concluded that the Proposed Action would have no impact to public services and utilities and, therefore, cumulative impacts to public services and utilities are not analyzed for the Proposed Action.

Cumulative Impact Analysis

During construction of the proposed Project, local spending would increase within the Ivanpah Valley. This would benefit the local and regional economy through expenditures on goods and services. While all of the projects considered in the cumulative impacts analysis would be expected to have some influence on socioeconomic resources within the Ivanpah Valley, a number of major renewable energy construction projects are planned which would be expected to have a particular influence on socioeconomic conditions. Collectively, these foreseeable projects would require large numbers of laborers during construction, but would have a smaller labor force for operations.

The addition of the foreseeable projects would likely draw on the unemployed work force, but also could draw employees from other regions. Local construction workers for the proposed Project or any of the foreseeable projects would receive additional income for the duration of their employment. These local workers as well as non-local workers would also likely spend locally. Construction crews would use local accommodations for lodging, which would have a beneficial impact on tourism in the area. Projects would also draw on locally procured materials, goods, and services, and some regional suppliers would be stimulated by these purchases. As more clean energy projects are permitted over time to meet renewable portfolio standard mandates, key regional suppliers would benefit in the future from retooling and inventory replenishment related to the clean energy infrastructure transformation in the area. The concurrent construction of the foreseeable projects would result in a beneficial cumulative impact on the local and regional economy and tourism, and could decrease unemployment for the periods of construction.

It is possible that some forms of tourism involving the natural appreciation of the desert and OHV use of this open space area would be impacted by the proposed Project, but mitigation should be able to address this potential effect (see *Section 4.12, Recreation*). Collectively, however, cumulative effects from multiple renewable projects to recreation may adversely affect economic conditions and the sense of social well-being of the local, active OHV community. Further, given that many people live in the area because of its rural character, the Proposed Action combined with other changes in the landscape may permanently alter the rural feel of the community.

Alternatives

Potential impacts to socioeconomics that would result from the construction, operation, and decommissioning of Alternatives C, D, and the BLM Preferred Alternative would be generally as described for Alternative B, as a similar number of jobs would be created and similar consumption of local goods and services would occur. The smaller footprint associated with the BLM Preferred Alternative would reduce either the intensity or duration of construction employment, reducing beneficial cumulative socioeconomic effects. The designation of the ACEC under Alternative D and the BLM Preferred Alternative and the expansion of the desert wildlife management area under the Stateline Solar Project could potentially contribute further to a loss of revenue from OHV recreation in these areas due to some increased restrictions; however, the ACEC and expanded desert wildlife management area could also draw additional tourism from other recreational users attracted to the protected area.

4.19.3.16 Environmental Justice

Cumulative impacts to environmental justice are not analyzed for the Proposed Action because the Proposed Action would not result in disproportionately high or adverse effects on minority or low-income populations and, therefore, would not contribute to cumulative impacts to environmental justice. As discussed in *Section 3.17, Environmental Justice*, there are no environmental justice communities within the study area for the Proposed Action with respect to income or minority populations (including Native American communities). As there are no populations living within the identified blocks, there are no low-income communities that would be impacted by the Proposed Action.

Alternatives

The effect on environmental justice from Alternatives C, D, and the BLM Preferred Alternative would be similar to that of Alternative B because they would be located within the same blocks with no at risk populations.

4.19.3.17 Energy and Minerals

There are no active mining claims within the proposed Project footprint. Further exploration and development of energy and mineral resources would be foreclosed from the Project footprint for the duration of Project operation, but there is no evidence of any energy or mineral resources present within the footprint. Therefore, the Project would not contribute to any cumulative impact to energy and minerals.

Alternatives

The direct effect on energy and minerals from Alternatives C, D, and the BLM Preferred Alternative would be similar to that of the Alternative B due to their general similarities in location and size.

The designation of a 30,912-acre or 31,859-acre ACEC under Alternative D or the BLM Preferred Alternative, respectively, could affect energy and minerals resources as additional restrictions would be placed on solid leasables, fluid leasables, and salable mineral disposals. Other cumulative projects in the region could have similar effects, as Project footprints from large site-type ROW generally prevent extraction of energy or mineral resources during their operational lifetime.

4.19.3.18 Fuels and Fire Management

The CESA for fuels and fire management is the Ivanpah Valley. The BLM Southern Nevada District Office's Integrated Weed Management Program incorporates vegetation, and fire and fuels management. Wildland fuel is "vegetation," therefore, the cumulative effects of the proposed action, initially and over a 50-year period, may affect fire and fuels management by increasing the wildland fuel load in the area. The primary reason for increased fuel load is due to the spread of invasive and noxious plant species. The impact analysis (*Section 4.18, Fuels and Fire Management*) indicates vegetation will trend towards these species. Therefore, the cumulative impacts to fuels and fire management would depend on the overall vegetation outcome given the amount of disturbance from all the cumulative projects and the opportunity for colonization of invasive and noxious species.

Fire management techniques for the proposed Project can be found in *Section 4.18 Fuels and Fire Management*. These techniques include a fire-break, vegetation height of less than 12 inches, use of herbicides, and well maintained access roads. It is assumed that other project developments would implement similar fuel and fire management plans. The incremental cumulative impact of the proposed Project when added to other RFFAs, would be minimal.

Alternatives

Alternative C, D, and the BLM Preferred Alternative would have a similar fire break and emergency access design as that of Alternative B (the Proposed Action) and would employ similar measures to prevent the spread of noxious or invasive weeds; therefore, the contribution to cumulative impacts to fuels and fire management would similar to Alternative B for Alternatives C, D, or the BLM Preferred Alternative. However, Alternative C would include grading and construction near the Mojave National Preserve, with a related increased risk for spread of noxious or invasive weeds to that area. The Stateline Solar Farm project would also occur near the Mojave National Preserve, so the cumulative effects of these two projects on fuels and fire risk in the Preserve would be additive. However, with proper design and implementation of a Noxious Weed Control Plan (APM-9), the Project's cumulative contribution to fuels and fire management would be incremental.

4.20 OTHER NEPA REQUIREMENTS

4.20.1 Short-Term Uses versus Long-Term Productivity

NEPA requires consideration of the relationship between short-term uses of the environment and long-term productivity associated with the proposed Project. This involves the consideration of whether the proposed Project would sacrifice a resource value that might benefit the environment in the long-term for some short-term value to the Applicant or the public. For purposes of this discussion, short-term refers to five years or less after the construction phase ends and subsequent restoration and rehabilitation activities. Long-term refers to five years or longer after those activities.

Short-term use of the environment during construction and restoration would result in the temporary loss of some resources, such as temporary loss of some habitat and access to recreational facilities, increased noise, and air quality impacts. Up to 3,881 acres of land would be subject to long-term disturbance and loss of availability within the proposed Project area, and some flora and fauna specimens in and around construction and infrastructure locations would be lost. Longer-term impacts include the permanent loss of some visual quality from the introduction of the solar arrays and associated infrastructure, access roads in previously undisturbed areas, and landscape scarring.

While there would be irreversible and irretrievable commitments of some resources, as noted below, there would be no permanent loss of the overall productivity of the environment from the proposed Project. Disturbance of desert tortoise connectivity would be expected to result in temporary effects to that species, but if connectivity were reestablished after site decommissioning and site restoration it is expected that such effects would not be permanent.

4.20.2 Irreversible and Irretrievable Commitments of Resources

Irreversible impacts are those that would result in changes to the environment that cannot be reversed, reclaimed, or repaired. An example of an irreversible impact would be the removal of groundwater from a poorly recharged aquifer. Once groundwater reserves are removed, they cannot be replaced or reclaimed. Irretrievable impacts are those that result in the temporary loss or degradation of the resource value until reclamation is successfully completed.

It is important to note, if approved, the ROW authorization for the proposed Project would include a required Performance and Reclamation bond to ensure compliance with the terms and conditions of the BLM ROW authorization, consistent with the requirements of 43 CFR 2805.12(g). The “Performance and Reclamation” bond would consist of three components. The first component would be hazardous materials; the second component would be the decommissioning and removal of improvements and facilities; and the third component would address reclamation, revegetation, restoration, and soil stabilization.

Prior to issuance of the BLM ROW authorization, the Applicant must submit a Decommissioning and Site Reclamation Plan that defines the reclamation, revegetation, restoration, and soil stabilization requirements for the Project area as a component of their Plan

of Development (43 CFR 2804.25(b)). The Decommissioning and Site Reclamation Plan requires expeditious reclamation of construction areas and the revegetation of disturbed areas to reduce invasive weed infestation and erosion and must be approved by the BLM authorized officer prior to the issuance of the ROW grant. The approved Decommissioning and Site Reclamation Plan will be used as the basis for determining the standard for reclamation, revegetation, restoration, and soil stabilization of the Project area.