

EXECUTIVE SUMMARY

The Pahrump Field Office of the Bureau of Land Management (BLM) has prepared this Draft Environmental Impact Statement (EIS) in response to a right-of-way application submitted by Solar Millennium, LLC (Proponent) to construct and operate the Amargosa Farm Road Solar Energy Project (Project). The proposed Project includes the construction and operation of two 232-megawatt (MW) dry-cooled solar power plants equipped with thermal energy storage capability and associated ancillary linear facilities. Facilities located within the Project area would occupy approximately 4,350 acres and would include solar fields, power blocks, an office and maintenance building, parking area, lay-down area, switchyard, and a stormwater detention basin.

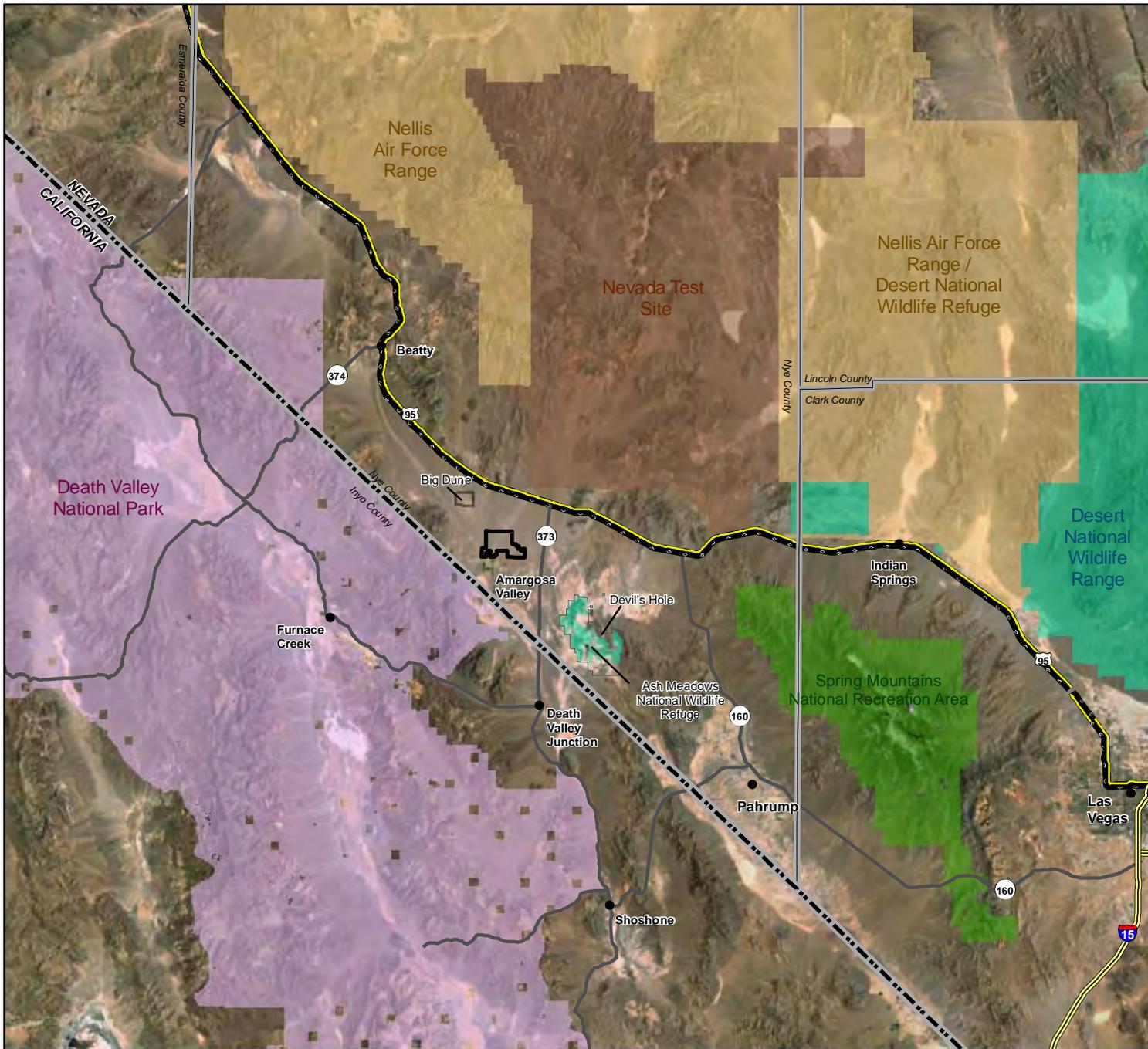
The proposed Project would utilize parabolic trough solar thermal technology to produce electrical power using steam turbine generators fed by solar steam generators. The main element of a parabolic trough power plant is the solar field. The solar field consists of numerous parallel rows of solar collectors, arranged on a north-south axis. The solar collectors follow the path of the sun from east to west during the day to keep the sun's rays continuously focused on a receiver tube. The reflectors consist of parabolic mirrors made from transparent, silver-coated glass, which concentrate the incident solar radiation 80-fold, focusing it onto the receiver tube in the solar collector. The receiver tube contains a heat transfer fluid (HTF), which is temperature-stable synthetic oil in a closed circuit that can be heated to temperatures of up to 752 degrees Fahrenheit (°F) (400 degrees Celsius [°C]). Once heated, the oil is pumped to a centrally located power block, where it flows through a heat exchanger.

The remainder of the process is similar to the steam cycle used in conventional power plants. The steam produced by the heat exchanger is used to drive a turbine connected to a generator, which produces electricity to be fed into a substation. With solar thermal technology, the heat is stored (referred to as thermal storage) and used during periods of cloud cover and up to 4.5 hours after sundown.

At this time, it is anticipated the proposed Project would be built in two separate phases, with the construction of the first phase beginning in 2010, or immediately following issuance of the BLM right-of-way grant and other federal, state, and local permits and approvals. Project construction is expected to occur over a total of 39 months. The Proponent would phase construction so that the first power plant would be operational approximately 1 year before the second power plant becomes operational.

ES-1.1 Project Overview

The proposed Project is located on BLM-administered lands, approximately 80 miles northwest of Las Vegas, in the Amargosa Valley in Nye County, Nevada (Figure ES-1). Some portions of the proposed Project would be located on private property, including a 40-acre parcel south of Amargosa Farm Road, and the wells to be used to supply water to the proposed Project.



Amargosa Farm Road Solar Energy Project (NVN-84359)

Project Vicinity Figure ES-1

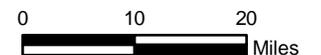
LEGEND

- Project Area
- Surface Management**
- Department of Defense
 - Department of Energy
 - National Park Service
 - US Fish and Wildlife Service
 - US Forest Service
- General Reference Features**
- Interstate
 - US Highway
 - State Highway
 - State Boundary
 - County Boundary
 - City / Town



Source: Surface Management - BLM, 2007;
Ash Meadows - USFWS, 2005;
Highways, Imagery - ESRI, 2009

February 2010



The Project area is located approximately 5 miles south of United States Highway 95 (US 95) and 3 miles west of Nevada State Route 373 (NV 373). The majority of the Project area would be located north of Amargosa Farm Road, and east of Valley View Road. The Proponent’s initial application for a right-of-way and subsequent Plan of Development erroneously stated the area of the right-of-way to be 7,810 acres. The actual area, by legal description is 7,630 acres.

On August 6, 2009, the Proponent sent a letter to the BLM requesting a reduction in the acreage from 7,630 acres to 6,320 acres. The Proponent’s decision to release a portion of the lands from further consideration was based upon refinement of the Project layout following surveys conducted in the spring of 2009. The lands released from further consideration are shown on Figure ES-2, Project Area. The legal description of BLM-administered lands requested under the Proponent’s request is provided in Table ES-1-1.

Township (T)	Range (R)	Section/Portion
T16 South	R48 East	Sec. 1 and 12 – all
T16 South	R48 East	Sec. 2, 11, 13, and 14 – Partial Section
T16 South	R49 East	Sec. 6, 7, and 17 – all
T16 South	R49 East	Sec. 5, 8, 9, 16 18 – Partial Section

ES-1.2 Purpose and Need for Action

ES-1.2.1 Bureau of Land Management Purpose and Need

The BLM’s purpose and need for the Amargosa Farm Road Solar Energy Project is to respond to Solar Millennium’s application under Title V of the Federal Land Policy Management Act (FLPMA) (43 U.S.C. § 1761) for a right-of-way grant to construct, operate and decommission a solar thermal generation facility and associated infrastructure in accordance with FLPMA, BLM right-of-way regulations, and other applicable federal laws. The BLM will decide whether to approve, approve with modification, or deny issuance of a right-of-way grant to Solar Millennium for the proposed Project. The decision the BLM will make is whether or not to grant the right-of-way, and if so, under what conditions.

Amargosa Farm Road Solar Energy Project (NVN-84359)

Project Area Figure ES-2

LEGEND

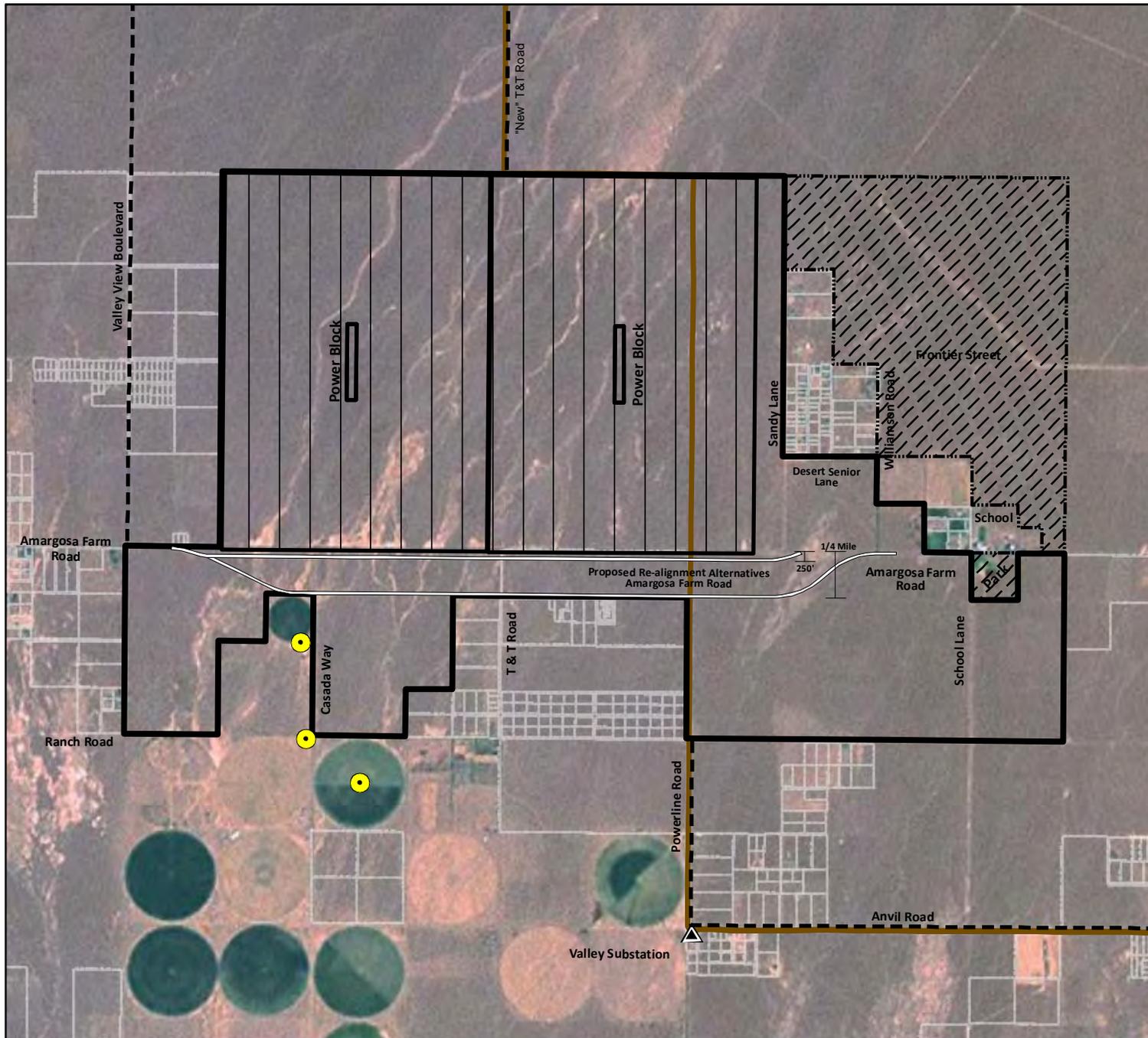
-  Initial Right-of-way Limits (November 2007)
-  Revised Right-of-way Limits (August 2009)
-  Lands Released from Consideration for Project
-  Proposed Solar Field
-  Alternative Access Road
-  Proposed Project Well
-  Existing Substation
-  Existing Transmission Line (<230kV)
-  Private Parcel Line

Note: The Power Block contains the steam turbine, salt storage tanks and other power generating equipment as described in the Plan of Development.



Source: Project Facilities - Solar Millennium, 2009;
Wells - Nevada State Engineer, 2008;
Substation, Transmission Line - Platts, 2009;
Imagery - ESRI, 2009

February 2010



ES-1.2.2 Department of Energy Purpose and Need

The Proponent is pursuing economic stimulus funding for the proposed Project under the American Recovery and Reinvestment Act (ARRA) of 2009 Public Law (PL) 111-5 (the “Recovery Act”). If the Department of Energy (DOE) decides to enter into negotiation of a possible loan guarantee with the Proponent, pursuant to Title XVII of the Energy Policy Act (EPAct) of 2005 the DOE would likely become a cooperation agency in developing the Final EIS. If the DOE accepts the Proponent’s application as suitable for funding, the DOE may adopt this EIS to meet their National Environmental Policy Act (NEPA) requirements in making a determination of funding. The purpose and need for action by DOE would be to comply with its mandate under the EPAct by selecting eligible projects that meet the goals of the EPAct.

ES-1.2.1 Proponent’s Proposal

According to the 2005 Nevada Renewable Energy and Energy Conservation Task Force Annual Report to the Legislature and the Governor, Nevada utilities will need in excess of 3,000 gigawatt hours per year (GWh/yr) of new renewable energy generation capability over the next 10 years to meet the state’s renewable energy needs (2005). The State of Nevada has established a Renewable Portfolio Standard that all public utilities must meet by investing in, and partnering with, commercial project developers to purchase renewable generated power, and participate in turnkey projects and/or co-development of renewable projects. This standard mandates that 12 percent of retail sales come from renewable resources by 2009-2010; 15 percent by 2011-2012; 18 percent by 2013-2014; 20 percent by 2015-2019; 22 percent by 2020-2024; and 25 percent by 2025. It is expected that at least 1,000 MW of new solar power will be required annually to meet this need.

Further, the Nevada Renewable Energy and Conservation Task Force has estimated that by increasing in-state renewable energy production to just 15 percent of the state’s generation, over 5,000 new jobs could be created, with an average annual Gross State Product effect of \$665 million through 2035 (2005).

In addition, solar energy projects that commence construction in 2010 can qualify for funding under the ARRA of 2009 P.L. 111-5 (the “Recovery Act”). The Recovery Act created Section 1705 authorizing a new program for rapid deployment of renewable energy projects and related manufacturing facilities, electric power transmission projects, and leading edge biofuels projects. The primary purposes of the Recovery Act are job preservation and creation, infrastructure investment, energy efficiency and science, assistance to the unemployed, and State and local fiscal stabilization. The Section 1705 Program is designed to address the current economic conditions of the nation, in part, through renewable energy, transmission and leading edge biofuels projects. The proposed Project is one of several solar projects in the western United States that are considered by the federal government to be potentially eligible for ARRA funding. A loan guarantee would reduce the cost financing and therefore the gross project cost over the life of the Project.

The Proponent’s objectives and purpose of the proposed Project are to:

- Develop a utility-scale parabolic trough solar thermal energy facility that optimizes power generation efficiency and provides energy at a reasonable and competitive cost.
- Construct and operate an environmentally compatible, economically sound, and operationally reliable solar power generation facility that will contribute approximately one million MW hours of clean, renewable solar energy per year to meet renewable energy goals.
- Locate the Project in an area with high solar insolation (i.e., high intensity of solar energy).
- Minimize environmental impacts, infrastructure needs, and costs by locating the plant near existing infrastructure, such as a transmission line, a substation, an adequate water supply, and highways/access roads, and by using designated corridors to the maximum extent possible.
- Develop a power-generation facility with the flexibility to continue producing electricity when the solar resource is not optimal (i.e., during cloud cover and early evening hours) to better match the load demands of utility offtakers.
- Develop a solar thermal energy facility that will qualify for, and benefit from, the ARRA Grant Program.
- Support the economy of southern Nevada by helping to ensure an adequate supply of renewable electrical energy, while creating additional tax revenues, employment, and expenditures in local businesses.

As of December 2009, the proposed Project was one of 31 renewable energy project that have met the required milestones to remain on BLM's fast-track list for expediting processing. Fast-track projects are those where the companies involved have demonstrated to the BLM that they have made sufficient progress to formally start the environmental review and public participation process. These projects are advanced enough in the permitting process that they could potentially be cleared for approval by December 2010, thus making them eligible for economic stimulus funding under ARRA.

ES-1.3 Public Participation and Agency Consultation

ES-1.3.1 Public Participation

Public scoping is an integral part of NEPA planning process. It provides “an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a Proposed Action” (40 CFR 1501.7). Initiation of the EIS process and the public scoping meetings for the proposed Project were announced through the Federal Register Notice of Intent (NOI), published on July 13, 2009 (Volume 74, Number 132, Page 33458), which marked the beginning of the public scoping period for the Project EIS.

The scoping period, required to be a minimum of 30 days, was announced as ending on August 12, 2009. Public scoping meetings were not conducted within this time period; therefore, a second notice was published in the Federal Register on September 17, 2009 (Volume 74, Number 179, Page 47820), reopening public scoping. This reopened scoping period was announced as ending on October 19, 2009.

Four scoping meetings were held from August 17 through August 24, 2009, and one information meeting, following the reopened scoping period, was held on September 22, 2009. During the public scoping period, a total of 151 comment documents were received, with a total of 1,175 comments provided. A comment document is defined as a method of response recorded as part of a public scoping transcript, email, fax, letter, or comment form. Because some documents had more than one comment, the total number of comments is greater than the number of respondents or individuals who submitted comments. A summary of comments received is provided in Chapter 1.9. Copies of the individual comments received during the scoping period are available for review at the BLM Pahrump Field Office.

ES-1.3.2 Agency and Tribal Consultation

Federal and state agencies were contacted individually to gather input for the EIS. Other resources management agencies at the federal and state levels were consulted to identify common concerns related to the Proposed Action or Alternatives. Cooperating agencies on this EIS include the Department of Defense (DOD), DOE, National Park Service (NPS), United States Army Corps of Engineers (USACE), Nevada Department of Wildlife (NDOW), and Nye County. Consultations with federal, state, and local resource management and regulatory agencies, as well as interested Tribal governments are ongoing.

A Biological Assessment has been prepared for the Proposed Action and will be submitted to the U.S. Fish and Wildlife Service (USFWS) as required by Section 7 of the Endangered Species Act of 1973. A species list was requested from the USFWS which identified flora and fauna listed as threatened, endangered, or candidate species that occur and have the potential to occur within the Project area and its vicinity. At the request of the USFWS, rare plant and Desert Tortoise surveys have been conducted within the Project area. Consultation with the USFWS will be triggered once the Biological Assessment has been submitted.

The BLM conducts consultation and coordination with American Indian Tribal governments for proposed projects that may affect their ancestral lands. On June 17, 2009 the BLM distributed formal consultation letters to the following groups:

- Pahrump Paiute Tribe
- Las Vegas Paiute Tribe
- Chemehuevi Indian Tribe
- Colorado River Indian Tribes
- Timbisha Shoshone Tribes

The notification letter informed them of six separate renewable energy projects being proposed in the Pahrump and Amargosa Valleys of Nye County, Nevada, including the proposed Project. The tribes were invited to provide input on any potential impacts to any culturally significant

areas within the proposed solar project areas, including the proposed Amargosa Farm Road Project area. The Tribes were also informed of when scoping meetings were to occur if they wanted to make any project comments. A field visit with the Timbisha Shoshone Tribe was conducted on September 17, 2009. No Tribal comments opposing the Project's proposed action have been received by the BLM.

ES-1.4 Proposed Action and Alternatives

ES-1.4.1 Proposed Action – Dry-Cooled Alternative

The Proposed Action alternative includes the construction and operation of a two-unit dry-cooled parabolic trough solar thermal power plant, with each unit having a net output of 232 MW. The plant will consist of a conventional steam Rankine-cycle power block, a parabolic trough solar field, a HTF and steam generation system, a nitrate salt thermal energy storage system, as well as a variety of ancillary facilities (sometimes referred to collectively as “balance-of-plant”), such as conventional water treatment, electrical switchgear, administration, warehouse, and maintenance facilities. The electric output of the plant will be provided entirely by solar energy. No electricity will be generated by the use of fossil fuel.

The Proponent’s original right-of-way request of 7,630 acres was refined to include only 6,320 acres. Project facilities would only be located on approximately 4,350 acres and would include the solar fields, power blocks, an office and maintenance building, parking area, lay-down area, stormwater detention basin, and switchyard.

As shown on Figure ES-2, the solar field will occupy the majority of the Project footprint. The final layout will be determined based on engineering design and in consideration of resource constraints and opportunities. General facility dimensions are listed in Table ES-1-2.

A land survey of the proposed right-of-way is being performed to determine the final boundary and extent of the Project area. A topographic survey was performed to obtain one-foot contours for final engineering design for grading and drainage-related requirements. A preliminary geotechnical study of the Project site will be conducted to evaluate general subsurface conditions, seismicity, and other geological hazards and to provide recommendations for design and construction of the foundations for Project structures.

All plant facilities will be designed, constructed, and operated in accordance with applicable laws, ordinances, regulations, and standards. All generating facilities will be located within the facility fence line.

Table ES-1-2 Preliminary Facility Dimensions for Proposed Alternative and Wet-Cooled Alternative			
Project Component	Approximate Dimensions / Acreage	Proposed Alternative (Dry-Cooled)	Wet-Cooled Alternative
Solar Fields	Two fields, Approximately 7,800 feet east-west by 11,000 feet north-south. Each field has a collector aperture area of approximately 2 million square meters. 1,970 acres	X	X
Power Blocks	One power block located in the center of each solar field; approximately 2,500 feet x 490 feet; 144 feet high for a dry-cooled tower, or 55 feet high for a wet-cooled tower (28 acres each)	X	X
Switchyard	400 feet x 400 feet (3.7 acres)	X	X
Assembly Hall/Maintenance Building	330 feet x 130 feet x 35 feet (1 acre)	X	X
Office	100 feet x 30 feet x 12 feet (.06 acres)	X	X
Parking Area	250 feet x 100 feet (0.5 acres)	X	X
Stormwater Detention Basin	1,200 feet x 1,200 feet (33 acres) – providing 122-acre-feet of storage assuming 4-foot-deep basin)	X	X
Evaporation Pond(s)	Up to four ponds; 800 feet x 1,250 feet approximately 46 acres		X
Bioremediation Area	400 feet x 800 feet (7.3 acres)	X	X

ES-1.4.2 Wet-Cooled Alternative

Under the wet-cooled alternative, the Proponent would construct and operate two 242 MW solar thermal power plants and ancillary facilities. Construction and operation of a wet-cooled project would be similar to a dry-cooled plant. Plant components and layout are similar under both the wet- and dry-cooled alternatives; the primary differences being the amount of water used for plant operations, the need for cooling towers for heat rejection from the steam cycle (see section 2.5.3.4), and the need for evaporation ponds. Table 2-2 lists the plant components for both the wet- and dry-cooled alternatives.

Water use in a wet-cooled plant would include water needed for the cooling tower to cool the steam cycle; water for solar collector mirror washing; makeup for the SSG feedwater; dust control, potable water and fire protection. The average total annual water usage for the wet-cooled alternative is estimated to be approximately 4,600 acre-feet per year (afy). Under the wet-cooled alternative, the 3 wells identified for use in under the dry-cooled alternative, would

supply a portion of the water required for operations. However, additional water supplies would be required under the wet-cooled alternative. The source of this additional water would be dependent on the availability of other water rights available for lease or sale in the Amargosa Desert Hydrographic Basin.

The wet-cooling alternative has performance advantages over the dry-cooling alternative offering approximately 11 MW greater electrical output during peak summer ambient temperature conditions. The performance of the wet-cooled alternative is enhanced because wet-cooling relies primarily on evaporative cooling to remove heat from the circulating water. In contrast, a dry-cooled alternative uses convective heat transfer, which operates similar to a car's radiator. In the dry-cooled alternative, an air cooled condenser using a large array of fans that force air over finned tube heat exchangers cools the steam turbine-generator exhaust steam. The disadvantages of dry-cooling are higher capital costs, higher auxiliary operating power requirements and an overall lower plant performance, especially on hot days, when the peak power is needed most. A dry-cooled plant provides about 5 percent less electric energy on an annual basis than a wet-cooled plant, because of reduced performance on hot summer days. The electricity cost for a dry-cooled plant is approximately 6 to 9 percent higher than for a wet-cooled plant. Thus dry-cooling of a trough plant minimizes water use, but at a 6 to 9 percent cost penalty.

ES-1.4.3 No Action Alternative

NEPA regulations require that EIS alternative analyses “include the alternative of no action” (40 CFR 1502.14[d]). The No Action Alternative provides a useful baseline for comparison of the environmental effects of the other alternatives. For this analysis, no action means that the BLM would reject the Applicant's proposal and the right-of-way as requested would not be approved or authorized.

Because the Project facilities would not exist, potential adverse environmental effects would not occur. However, it is important to also note that any beneficial effects such as reduced fossil fuel use would also not occur.

ES-1.4.4 Other Alternatives Considered But Not Evaluated in Detail

In accordance with Title 40 CFR Section 1502.14, and consistent with guidance in BLM's NEPA Handbook, alternatives were not carried forward for further analysis if the alternative:

- is ineffective (it would not respond to the BLM's purpose and need).
- is technically or economically infeasible.
- is inconsistent with the basic policy objectives of the Las Vegas Resource Management Plan/EIS.
- implementation is remote or speculative.
- is substantially similar in design to an alternative that is analyzed.

- would have substantially similar effects to an alternative that is analyzed.

ES-1.4.4.1 Alternative Sites

As part of its siting process, the Proponent used a refined set of criteria to screen, identify, and prioritize potential land sites for eventual solar development. Criteria include all aspects of feasibility including physical characteristics of the site, environmental considerations, as well as economic factors. Each of these criteria was applied during the screening phase for the proposed Project, which led to the selection of the current site.

These criteria included:

- **Solar Resource** – The site needs to be located where high solar insolation is available to maximize the plant’s output and allow efficient utilization of the land area affected by project development. For a project to be economically viable, solar insolation levels of greater than 7 kilowatt-hours per square meter per day (kWh/m²/day) are desirable.
- **Size and Shape** – The site must be large enough (at least 4,000 contiguous acres) and of adequate proportions to include two 232 MW parabolic trough solar thermal plants. The shape of the site should also support an efficient and cost-effective layout of the project facilities.
- **Slope** – The site should be relatively flat, with a slope of 2 percent or less, to minimize the need for extensive grading and a large volume of cut and fill.
- **Environmental sensitivity** – The site should not be highly pristine or biologically sensitive (e.g. not within a designated wilderness area or Area of Critical Environmental Concern).
- **Availability of Infrastructure and Water** – To minimize cost and potential environmental impacts, the site should be located where water resources are available and interconnection to an existing transmission system is possible without the construction of lengthy transmission lines. In addition, the site should be in reasonable proximity to suitable transportation infrastructure to allow easier access during both construction and operation without creating the need for additional road construction.
- **Site Control** – The land must be available for sale or lease/right-of-way, at a reasonable cost and be free of conflicting encumbrances.
- **Labor Availability** – The site should be close enough to areas with large construction labor pools so as to maximize the number of construction workers within daily commuting range.
- **Economic Viability** – The Project must be economically viable and competitive with other renewable technology projects, including wind, geothermal, and other solar projects. To be viable, the site should be located on property currently available at a

reasonable cost, be as close as possible to transmission and transportation infrastructure, and have a high solar resource value.

The selected Project site is located in an area containing excellent solar resource and is large enough to accommodate two 232 MW plants in an optimal layout. In addition, the Project site is relatively flat; is not located in any wildlife management or conservation areas; has access to transmission infrastructure and water resources; and was available for an application for a right-of-way from the BLM. Finally, the Project site allows for access to skilled labor and other industrial infrastructure from nearby Pahrump and Las Vegas.

Three alternative sites were considered. The three sites include a site southeast of Pahrump “Sandy”, a site a few miles south of the proposed Project along Anvil Road in Amargosa Valley “Anvil Road”, and a site near the Beatty Airport “Beatty”. Right-of-way applications were filed for each of these sites in 2007 and 2008. The right-of-way applications for each of these sites were ultimately withdrawn after the Proponent conducted due diligence and preliminary studies on each site and determined the alternative sites did not meet the above criteria.

The Sandy site consisted of approximately 8,000 acres in Pahrump Valley approximately 20 miles southeast of Pahrump. Due to the slope of the site, as well as the existence of sensitive vegetation types, conflicting encumbrances, and water availability, the site was not a viable option.

The Anvil Road site consisted of approximately 1,000 acres, located a few miles south of the selected Project site. The site was flat and had good access to transmission infrastructure but was too small to accommodate one 232 MW plant, let alone two of them. The Proponent explored acquiring additional land surrounding the site but determined that the acquisition of sufficient lands was not economically viable. This, combined with the size and existing encumbrances on the site, made the site not viable.

The Beatty site consisted of approximately 2,500 acres located adjacent to the Beatty Airport (approximately 35 miles north of the Project site). It was flat and had good solar resource, however, the site was too small for two 232 MW plants, had existing encumbrances and the Proponent determined that access to transmission and water would be more difficult and costly than the Project site that was ultimately selected.

Table ES-1-3 summarizes the weaknesses of each of the alternative sites.

Table ES-1-3 Alternative Sites Considered						
Alternative Site	Solar Resources	Size and Shape	Slope	Environmental Sensitivity	Availability of Infrastructure	Site Control
Sandy			x	x		x
Anvil Road		x				x
Beatty		x			x	

Various other location in Nye County were also investigated, but were not ultimately pursued as they failed to meet the Proponent's baseline screening criteria.

The Proponent also considered the alternative of developing the proposed Project as a single 232 MW plant. Generally, building one plant would have fewer environmental impacts. However, given the infrastructure requirements associated with building a single plant, building two plants allows for economies of scale and reduces the infrastructure impacts, including transmission access, and water development. In addition, a single 232 MW plant would not be as effective in meeting the Project objective of supporting attainment of renewable energy mandates and objectives. For these reasons, the development of a smaller project was rejected.

During the scoping period, several comments were received requesting the Proponent move the Project site further north; at a distance of at least 0.5 to 2 miles away from existing residential or public buildings. The BLM land immediately north of the Project area has a pending solar energy development right-of-way application on file with the BLM Pahrump Field Office (Cogentrix - NVN-083150). The Proponent filed an overlapping or "second-in-line" right-of-way application on these lands (NVN-087366); however, subsequent discussions between Cogentrix and BLM staff indicate Cogentrix intends to develop a solar energy project at this location within the next 2 to 3 years. Thereby, it is unlikely that the Proponent's overlapping application could be processed.

ES-1.4.4.2 Alternative Solar Technology

The Proponent has requested a right-of-way to construct and operate a dry-cooled, solar thermal parabolic trough project. Solar thermal parabolic trough technology has a history of successful operation in the United States. The Solar Energy Generating Systems (SEGS), located in California's Mojave Desert, is the largest solar energy generating facility in the world. It consists of nine solar power plants with an installed capacity of 354 MW installed capacity that have operated successfully over the past 30 years. Although other solar thermal technologies are under active development, none of these technologies have the construction and operating experience of the parabolic trough technology. Building upon this experience base significantly reduces much of the construction and operational risk associated with a project of this magnitude. In addition, the Proponent has significant experience and expertise in developing and constructing parabolic trough plants. The Proponent is a wholly owned subsidiary of Solar Trust of America, LLC, a joint venture between Solar Millennium AG and Ferrostaal AG. Solar Millennium AG is an international developer and supplier of parabolic trough collector technology used in powering solar thermal power plants. Solar Millennium AG developed and designed the first parabolic trough power plants, Andasol 1-3, in Spain. The Andasol 1 plant began operating in December 2008, the Andasol 2 plant is currently in the commissioning phase, and the Andasol 3 plant, is currently under construction. When the entire Andasol complex is completed in 2011, it is expected to generate enough electricity to serve 150,000 Spanish households or about 600,000 people. Ferrostaal AG is a worldwide provider of industrial services and plant construction and engineering.

Although all of the SEGS and Andasol projects are wet-cooled plants, a dry-cooled alternative is the Proponent's preferred alternative. Dry-cooled technology has been used successfully on large

thermal generating plants in the United States for almost 30 years dating back to its use on the 330 MW, coal-fired, Wyodak power plant in Wyoming. The largest dry-cooled power plant installation in the world, the 4,000 MW coal-fired Matimba plant in South Africa, has successfully operated for over 10 years. Dry-cooled technology was proposed because it is a well proven technology for this scale of power generation in desert environments.

Construction and operation of a solar thermal parabolic trough plant using wet-cooling is an alternative that is considered in this Draft EIS. Wet-cooling technology has performance advantages in comparison to dry-cooling. Performance is enhanced because wet-cooling relies primarily on evaporation to remove heat from the circulating water, while dry-cooling technology uses an air cooled condenser that cools the steam turbine-generator exhaust steam using a large array of fans that force air over finned tube heat exchangers. The disadvantages of dry-cooling are higher capital costs, higher auxiliary operating power requirements and an overall lower plant performance, especially on hot days, when the peak power is needed most. A dry-cooled plant provides approximately 5 percent less electric energy on an annual basis than a wet-cooled plant, because of reduced performance on hot summer days. The electricity cost for a dry-cooled plant is approximately 6 to 9 percent higher than for a wet-cooled plant. Thus dry-cooling of a trough plant minimizes water use, but at a 6 to 9 percent cost penalty.

ES-1.4.5 Agency-Preferred Alternative

The BLM is awaiting public input before identifying a preferred alternative. The environmental consequences of the Proposed Action and Alternatives are summarized and compared in Table ES-1-4 below.

Executive Summary

Table ES-1-4 Summary of Impacts by Resources for the Amargosa Farm Road Solar Energy Project Proposed Action, Wet-Cooled Alternative, and No Action Alternative		
Proposed Action – Dry-Cooled Alternative	Wet-Cooled Alternative	No Action Alternative
Air Quality and Climate – Sections 3.1 and 4.1		
<p>Direct effects on air quality would occur from earthmoving activity during construction (fugitive dust, PM₁₀ and PM_{2.5}) and tailpipe emissions from heavy construction equipment and worker vehicles (PM, NO_x, SO₂, CO, and VOC). The Proponent would comply with Federal and State air quality standards. Particulate emissions during construction would be temporary and mitigated through adherence to the recommended mitigation measures.</p> <p>Operation of the solar power plant would not result in increases of Potential for Significant Deterioration emission levels in the regional area. The facility is not considered a major stationary source with potential to cause significant air quality impacts. The Project's operation would not cause new violations of any NO₂, SO₂, PM_{2.5} or CO ambient air quality standards.</p>	<p>Impacts to air quality from construction and operation of a wet-cooled solar plant would be similar to the impacts described below for the Proposed Action (dry-cooled alternative). The primary differences is the additional PM₁₀ and PM_{2.5} emissions from the cooling tower associated with a wet-cooled plant due to solids in the entrained moisture in the cooling tower drift.</p>	<p>Under the No Action Alternative, there would be no short-term construction-related exhaust or fugitive dust impacts. No impacts to air quality would occur under the No Action Alternative. The No Action Alternative, therefore, would not contribute to the State of Nevada's established Renewable Portfolio Standard goals.</p>
Geological Hazards and Mineral Resources – Sections 3.2 and 4.2		
<p>The Proposed Action would not result in impacts to geological resources. However, seismic activity and ground subsidence in the region could potentially impact structures constructed and operated under the Proposed Action. All project components and facilities would be constructed in accordance with applicable regulations, engineering protocols, and safety standards to minimize potential impacts from seismic activity. The Proposed Action would not result in impacts to mineral resources, as no active claims, mines, or quarries are present within the Project area.</p>	<p>Impacts to geological hazards and mineral resources from construction and operation of a wet-cooled solar plant would be similar to the impacts described for the Proposed Action (dry-cooled alternative).</p>	<p>Under the No Action Alternative, no Project-related impacts to geological hazards or mineral resources would occur.</p>
Soils – Sections 3.3 and 4.3		
<p>Direct impacts to soil resources associated with construction activities under the Proposed Action include increased water- and wind-induced soil erosion from within the Project area. No soils capable of supporting Prime Farmland would be impacted by the Proposed</p>	<p>Impacts to soils from construction and operation of a wet-cooled solar plant would be similar to the impacts described for the Proposed Action (dry-cooled alternative).</p>	<p>Under the No Action Alternative, no Project-related impacts to soil resources would occur.</p>

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Proposed Action – Dry-Cooled Alternative	Wet-Cooled Alternative	No Action Alternative
<p>Action. There would be no impacts to soil resources as a result of operation or maintenance of the components or facilities under the Proposed Action. Site-specific best management practices to minimize soil erosion and sedimentation would be implemented during construction and operations. The selected erosion and sediment control best management practices and environmental protection measures would be based on the type of disturbance expected, soil type, and the location of the site relative to sensitive resources.</p>		
Water Resources – Sections 3.4 and 4.4		
<p>Under the Proposed Action (dry-cooled alternative), the demand for operational water would be 400 acre-feet per year (afy). The proposed source of the water is three existing wells, currently producing approximately 1300 afy. With either a wet- or dry-cooled option, water rights will be acquired from an existing water right owner(s), and converted from irrigation use to industrial use.</p> <p>The section of the Fortymile Wash that traverses the Project area will be rechanneled and designed to intercept the 100-year storm event and convey the concentrated flow to historic discharge locations south of the Project site. The Proponent is coordinating these activities with the BLM, Nye County, and the USACE.</p> <p>Potential impacts to water resources during construction would be primarily associated with surface disturbing activities, but could also be a result of accidental spills and handling and storage of hazardous chemicals. Mitigation measures are proposed to prevent spills of chemicals, as well as to respond to spills should they occur.</p>	<p>Under this alternative, the demand for water would be 4,600 afy, which is substantially more than that required for the Proposed Action. It is assumed that the water that could be acquired for the wet-cooled option would have been used on an annual basis by the current water rights owner(s) at the same volume. New wells would be drilled on-site and changes in the points of diversion, place of use and manner of use would be required to be approved by the Nevada Division of Water Resources. Water acquisitions would be required to comply with Nevada State Engineer Ruling No. 1197 and any other Nevada state regulations and policies. The reduction in return flow from irrigation would be increased under this alternative, but would still be substantially less than the volume modeled.</p> <p>Construction-related impacts on water resources for this alternative would be the same as the Proposed Action (dry-cooled alternative).</p>	<p>Under the No Action Alternative, no Project-related impacts to water resources would occur.</p>
Noise – Sections 3.5 and 4.5		
<p>Throughout the construction of the proposed Project, temporary noise impacts are expected to briefly radiate within the defined boundaries</p>	<p>Impacts to noise levels from construction and operation of a wet-cooled solar plant may be similar to</p>	<p>Under the No Action Alternative, no Project-related</p>

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Proposed Action – Dry-Cooled Alternative	Wet-Cooled Alternative	No Action Alternative
<p>of the project site. Under Environmental Protection Agency (EPA) guidelines for outdoor noise impacts to residential property lines, the noise impacts are considered to be less than significant and no mitigation will be required for the temporary construction operations. Operational activities of the Proposed Action were evaluated to determine the worst-case daily operational noise impacts. Under EPA noise threshold guidelines, the impacts were found to be less than significant and require no mitigation.</p> <p>Employees working within the operational areas may be exposed to areas considered as a sensitive noise receptor location. Under Occupational Safety and Health Administration (OSHA) Standards the impact of worst-case calculated noise exposure levels the impacts is considered less than significant.</p>	<p>the impacts described for the Proposed Action (dry-cooled alternative). The noise producing mechanical equipment is situated at a great height in a wet-cooled solar plant and, as such, may result in slight decreases in operational noise as compared to the dry-cooled alternative.</p>	<p>impacts to noise levels would occur.</p>
Biological Resources – Sections 3.6 and 4.6		
<p>VEGETATION RESOURCES:</p> <p>Potential direct impacts to vegetation resources associated with construction activities would include clearing and grubbing of approximately 4,350 acres of creosote bush-dominated native vegetation for the duration of the proposed Project life, and the potential to introduce or spread non-native weeds already present in the Project area or brought in by contaminated vehicles.</p> <p>No potential habitats for federally listed threatened or endangered plant species occur within the Project area; however, two state protected cacti species are present and would need to be salvaged in accordance with NRS 527.060-120.</p> <p>Indirect impacts to vegetation resources include soil compaction, changes to soil structure by use of dust suppression, spread of non-native weeds already present in the Project area and brought in by contaminated vehicles, and changes in the distribution of precipitation falling on the solar fields.</p>	<p>VEGETATION RESOURCES:</p> <p>Impacts to vegetation from construction and operation of a wet-cooled solar plant would be similar to the impacts described for the Proposed Action (dry-cooled alternative) with the addition of the following impacts.</p> <p>The open evaporation ponds would be an attractant to many species of waterfowl, migratory birds, and foraging bats. The increased use of the ponds by wildlife would increase the potential of harm to those individuals. Further, increased use of the ponds by birds would increase the presence of raptors, increasing predation on those species at the ponds. The raptors would utilize the newly constructed structures as perch sites for hunting.</p> <p>Similar to the dry-cooled alternative, there would be no new groundwater pumping under the wet-cooled alternative. Water for Project construction and</p>	<p>Under the No Action Alternative, no Project-related impacts to biological resources would occur.</p>

Table ES-1-4 Summary of Impacts by Resources for the Amargosa Farm Road Solar Energy Project Proposed Action, Wet-Cooled Alternative, and No Action Alternative

Proposed Action – Dry-Cooled Alternative	Wet-Cooled Alternative	No Action Alternative
<p>WILDLIFE RESOURCES:</p> <p>Direct impacts on wildlife resources can result from ground disturbance caused by construction-related activities, which can impact wildlife habitat by removing vegetation, altering plant composition or structure (e.g. non-native invasive species replacing native species), causing fragmentation, loss of connectivity for wildlife, increased predation, and altering soil characteristics. Pre-construction clearance surveys would be conducted to ensure that activities associated with the construction and operation of the Project would not cause mortality to individuals. Mortality could also occur from collisions with equipment and vehicles. Predation could increase as construction displaces wildlife from protected cover to uncovered habitat. Removal of vegetation, alteration of Fortymile Wash, and placement of fencing around parameter of the solar fields, could impede travel opportunities for wildlife.</p> <p>The Project area contains low quality, but suitable habitat for Desert Tortoise. Four old Class IV burrows were located within the Project area. Efforts will be made to ensure that the area is clear of any active burrows and all live tortoises prior to any construction being conducted.</p> <p>Direct impacts on migratory birds could result from ground disturbance during construction. Construction activities may impact suitable habitat for nesting and burrowing birds including Burrowing Owl, a BLM Sensitive species and a Nevada animal species considered to be at risk in all counties in Nevada. Old burrowing Owl burrows were found in the Project area. For other nesting bird species, direct impacts could include eliminating potential nesting habitat and loss of individuals. The Migratory Bird Treaty Act (MBTA) applies to species that would be impacted during the construction phase of the Project.</p> <p>Other sensitive species observed within the Project area include Prairie Falcon and LeConte’s Thrasher. There would be direct impacts to LeConte’s Thrasher by eliminating suitable nesting habitat. Direct impacts on Desert Tortoise can result from loss of tortoise habitat;</p>	<p>operations, would be obtained from existing water rights and converted to industrial use.</p> <p>WILDLIFE RESOURCES:</p> <p>Impacts to wildlife resources from construction and operation of a wet-cooled solar plant would be similar to the impacts described for the Proposed Action (dry-cooled alternative) with the addition of the following potential impacts.</p> <p>The wet-cooled alternative would include two evaporation ponds that would collect blowdown water from the cooling towers. There is potential for wildlife threats posed by the evaporation ponds. First, creation of a new water source to an area where water is scarce could attract ravens to the Project, potentially increasing predation rates on juvenile desert tortoise in adjacent habitat. Second, waterfowl, shorebirds, and other resident or migratory birds could be harmed if they drink evaporation pond water or eat aquatic invertebrates (or their terrestrial emergent’s) inhabiting evaporation pond water.</p> <p>Similar to the dry-cooled alternative, there would be no new groundwater pumping under the wet-cooled alternative. Water for Project construction and operations, would be obtained from existing water rights and converted to industrial use. New wells would be drilled on-site and changes in the points of diversion, place of use and manner of use would be required to be approved by the Nevada Division of Water Resources.</p>	

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Proposed Action – Dry-Cooled Alternative	Wet-Cooled Alternative	No Action Alternative
<p>including loss of old burrow sites, located in the northwest quarter of the Project area. Permanent loss of native vegetation would directly impact at least 12 snake and lizard species that were found in the Project area. Two such species include, Desert Iguana, included on the Nevada Natural Heritage Program Animal Watch List, and Nevada Shovel-nosed Snake, included as a conservation priority species in Nevada.</p> <p>Under the Proposed Action, the Proponent would purchase or lease existing water rights and convert the type of water use from current agricultural use to industrial use. As such, the proposed Project would not increase pumping in the hydrographic basin. Using the best available model and a conservative assumption that Project pumping would add to, rather than replace existing pumping impacts to water levels in Devils Hole were determined to be negligible. Therefore, indirect impacts from groundwater pumping to Devils Hole and associated sensitive wildlife species are also presumed to be negligible.</p>		
Historic and Cultural Resources – Sections 3.7 and 4.7		
<p>Sixteen cultural resource sites were identified within the Area of Potential Effects of the Proposed Action. Only one site has been determined eligible for listing on the National Register of Historic Places (NRHP) under Criterion D. Direct effects to this site could occur as a result of ground disturbing activities associated with the construction of the proposed Project.</p> <p>An Historic Properties Treatment Plan describing the mitigation measures that would be employed to resolve any adverse effect to the one NRHP eligible site would be prepared. It is anticipated that any potential direct impacts from Project construction would be fully mitigated through data recovery. If previously unidentified cultural resources, human remains, or funerary items are discovered during Project activities, the procedures outlined in the BLM Nevada State Protocol Agreement would be implemented.</p>	<p>Impacts to cultural resources from construction and operation of a wet-cooled solar plant would be similar to the impacts described for the Proposed Action (dry-cooled alternative).</p>	<p>Under the No Action Alternative, no Project-related impacts to cultural resources would occur.</p>

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Proposed Action – Dry-Cooled Alternative	Wet-Cooled Alternative	No Action Alternative
Paleontological Resources – Sections 3.8 and 4.8		
<p>No previously discovered paleontological localities have been identified within the Project area. However, a geological unit with an undetermined potential for containing significant paleontological resources was identified within the Project area.</p> <p>The probability is low that construction activities under the Proposed Action may result in the exposure of paleontological resources in this geological unit, which consists of marl deposits that represent Pleistocene spring deposits. There would be no impacts to paleontological resources as a result of operation or maintenance of the components or facilities under the Proposed Action.</p>	<p>Impacts to paleontological resources from construction and operation of a wet-cooled solar plant would be similar to the impacts described for the Proposed Action (dry-cooled alternative).</p>	<p>Under the No Action Alternative, no Project-related impacts to paleontological resources would occur.</p>
Socioeconomic Resources – Sections 3.9 and 4.9		
<p>Construction of the proposed Project would last 39 months. Construction is expected to directly create an average of about 650 annual full-time employment (FTEs) over 39 months, with a peak monthly employment of about 1,300 FTEs. This direct employment will create both indirect and induced secondary employment in the regional area. For all projects in the region, temporary housing facilities would be needed and the added population during construction could place a burden on local social and public services.</p> <p>The construction payroll has been estimated at approximately \$68.8 million annually. Capital expenditures and local spending on construction materials and equipment within the ROI are estimated to total approximately \$47.1 million annually. During construction, the proposed Project would generate up to \$34 million for Nye County in property taxes, and pay approximately \$45 million in sales tax to the State of Nevada for the Local School Support Tax.</p> <p>During operation, it is expected that the annual purchases for materials supplies, equipment, and services within the ROI would total approximately \$6.0 million. For example, if all purchases are made within Nye County, which has a current tax rate of 7.1 percent, these</p>	<p>Socioeconomic effects under the wet-cooled alternative would be the same as the Proposed Action (dry-cooled alternative).</p>	<p>Under the No Action Alternative, the right-of-way would not be granted. However, the land on which the Project is proposed would become available to other uses that are consistent with BLM’s land use plan, including another renewable energy project. The beneficial impact on the regional economy from construction and operation of the proposed Project would not occur.</p>

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Proposed Action – Dry-Cooled Alternative	Wet-Cooled Alternative	No Action Alternative
expenditures would generate approximately \$355,000 in annual sales tax revenue.		
Environmental Justice – Sections 3.10 and 4.10		
Potential direct and indirect impacts associated with the Proposed Action would not have a disproportionate effect on low-income or minority populations. There are no special issues, such as housing, transportation, access, or resource use in the Project area that would affect the environmental justice population disproportionately.	Impacts to environmental justice under the wet-cooled alternative would be same as those described under the Proposed Action (dry-cooled alternative).	Under the No Action Alternative, no Project-related impacts to environmental justice would occur.
Land Use, Recreation, Transportation and Access – Sections 3.11 and 4.11		
<p>LAND USE: Construction and operation of the Proposed Action would permanently disturb approximately 4,350 acres, and would make this acreage unavailable to be developed for other uses. No residential, commercial, or industrial land uses would be directly impacted by construction or operation of the proposed Project.</p> <p>TRANSPORTATION AND ACCESS: The proposed Project would have short-term impacts on traffic flows and volumes on area roadways. Increased construction traffic on local unimproved roads may contribute to road deterioration. No access to commercial or residential areas would be restricted; however construction activity could potentially delay users’ daily commute times within the Valley’s transportation network.</p> <p>Operation of the Proposed Action would have long-term, cumulative impacts on traffic flows and volumes on roadways when combined with the other proposed energy projects and the commercial activity associated with increased industry in the area.</p> <p>All disturbance areas not covered by project facilities would be reclaimed in accordance with BLM protocols.</p> <p>RECREATION and SPECIAL MANAGEMENT AREAS:</p>	Impacts to land use, recreation, transportation, and access under the wet-cooled alternative would be the same as those described under the Proposed Action (dry-cooled alternative).	Land use would not change on federal lands. However, land use changes could continue on adjacent private lands. Under the No Action Alternative, no Project-related impacts to transportation and access would occur. Under the No Action Alternative, no Project-related impacts to Areas of Critical Environmental Concern, wilderness, or other special use areas would occur. No project-related impacts to recreational use of public lands would occur.

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Proposed Action – Dry-Cooled Alternative	Wet-Cooled Alternative	No Action Alternative
The proposed Project would not preclude the use of recreation and special management areas, but would remove land currently available for dispersed recreation on the Project site. Operation and maintenance of the Project facilities would not limit public access to recreation opportunities in the surrounding area.		
Visual Resources – Sections 3.12 and 4.12		
Visual impacts would occur during the construction of the proposed project based on the introduction of construction equipment, higher levels of traffic, potential fugitive dust, and new forms of night lighting in the foreground distance zone of high sensitivity residential viewers along Sandy Lane and adjacent to Valley View Estates. Long term impacts would be based on the introduction of moderate/strong visual contrast associated with Project components (e.g. solar troughs, power block, transmission lines, and ancillary buildings) within a rural to natural setting that would be visible to moderate and high sensitivity viewers. The majority of long term impacts are anticipated to range from low to moderate based on the relatively low profile of the project and the occurrence of various existing landscape features (i.e. topography, ornamental vegetation, and structures associated with the town of Amargosa Valley) that would screen the project and reduce contrast from moderate and high sensitivity viewers. Limited occurrences of high impacts would occur where moderate to high sensitivity viewers would have unobstructed views of the project in the foreground distance zone (i.e. Sandy Lane and Valley View Estates residences). Compliance is anticipated with BLM Visual Resource Management (VRM) Class IV objectives.	Impacts to visual resources under the wet-cooled alternative would be similar to those described for the Proposed Action with the following exception. Because a wet-cooling unit is less than half the height of a dry-cooled unit, the contrast for key observation points (KOPs) with views of the power block would be less visible to sensitive viewers under the wet-cooled alternative. High impacts would remain for residences located along Sandy Lane and within Valley View Estates; however, impacts would be reduced for all other identified sensitive viewers and residences with views of the Project area.	Under the No Action Alternative, no Project-related impacts to visual resources would occur as no project facilities would be constructed on BLM lands.
Hazardous Materials and Waste – Sections 3.13 and 4.13		
Potential wastes that could be generated at the site include domestic non-hazardous solid waste, hazardous wastes or materials, and used wastes that can be recycled. These types of substances, materials, and wastes most likely would be present during stages of construction,	Impacts from hazardous materials and solid waste under the wet-cooled alternative would be same as those described under the Proposed Action.	There would be no Project-related hazardous materials or solid waste produced under the No Action Alternative.

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development, and operation of the facility. During all stages of plant construction and operation, strict compliance with all Federal, state, and local regulations governing the management of hazardous materials is required by law.		

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