SOLARRESERVE

July 10, 2009

Crystal Jackson, Commission Secretary
PUBLIC UTILITIES COMMISSION OF NEVADA
1150 E. William Street
Carson City, Nevada 89701

RE: TONOPAH SOLAR ENERGY, LLC
CRESCENT DUNES SOLAR ENERGY PROJECT

Dear Ms. Jackson:

Please accept for filing the following document and all attachments as Tonopah Solar Energy, LLC's, application for a Nevada Utility Environmental Protection Act ("UEPA") permit for the Tonopah Crescent Dunes Project. This UEPA permit application is for a 100 - 180 megawatt ("MW") solar thermal generating facility, as described in the enclosed attachments.

This UEPA permit application contains preliminary information pertaining to the proposed project. As required by applicable regulations, an amended application for a UEPA permit will be filed with your office upon completion of the required federal NEPA process.

Respectfully submitted,

Julie Way
Director of Development

Enclosures

LIST OF ENCLOSURES

UEPA Application for a Permit to Construct
Tonopah Solar Energy, LLC
Crescent Dunes Solar Energy Project
Nye County, Nevada
July 10, 2009

This application includes the following:

$200 Filing Fee – attached

Part 1:

- Cover Sheet
- Table of Contents
- Draft Notice of UEPA Application
- UEPA Application
- Executive Summary
- Description of the Location of Facility
- Description of the Facility
- Environmental Statement
- Agency Approvals / Required Permits
- Public Interest, State Benefit and Need for Proposed Facility
- Reliability of Facility
- Public Notice: Proof of Publication
- Certification of Service

Part 2:

- Attachments

PART 1: Application

UEPA APPLICATION FOR A PERMIT TO CONSTRUCT THE CRESCENT DUNES SOLAR ENERGY PROJECT

TONOPAH SOLAR ENERGY, LLC
Julie Way, Director of Development
2425 Olympic Blvd., Suite 500 East
Santa Monica, California 90404

T: 310.315.2235
F: 310.315.2201

Environmental Statement Abstract:
An application for Right-of-Way on which to construct a solar energy generating facility has been filed with the Battle Mountain District of the U.S. Bureau of Land Management. Tonopah Solar Energy, LLC has been advised that an Environmental Impact Statement (EIS) will be required and prepared by the U.S. Bureau of Land Management. Upon completion of the EIS, Tonopah Solar Energy, LLC will file an amended application with the Public Utilities Commission of Nevada pursuant to NRS 704.870 (2)(b), in compliance with the provisions of subsection (1) and all other pertinent provisions of said statute.

Public Notices:
Copies of the Public Notice of the Application and proof of the publication of the Public Notice as required by NRS 704.870 are enclosed in this application (Section 10).

UEPA Table of Contents

SECTION 1.0

Draft Notice of UEPA Application

PUBLIC UTILITIES COMMISSION OF NEVADA
DRAFT NOTICE

Pursuant to Nevada Administrative Code ("NAC") 703.162, the Public Utilities Commission of Nevada ("Commission") requires that a draft notice be included with all UEPA applications, tariff filings, complaints and petitions.

PROJECT TITLE AND RELIEF REQUESTED[1]

The title of the proposed project is Crescent Dunes Solar Energy Project. If the application is granted, the project would supply a nominal 100-180 megawatts of renewable energy to the State of Nevada. The applicant requests the Commission to begin review and ultimately approve the proposed UEPA application.

NAME OF APPLICANT[2]

Tonopah Solar Energy, LLC.
Julie Way, Director of Development

SUMMARY OF THE TYPE OF PROCEEDING AND RELIEF REQUESTED[3]

Tonopah Solar Energy, LLC, submits this UEPA application pursuant to NRS 704.820 through 704.900, to the Public Utilities Commission of Nevada ("Commission") for consideration to permit and construct a nominal 100-180 megawatt ("MW") solar thermal generating facility together with a Transmission Interconnection to the Sierra Pacific Power Company Anaconda Substation approximately 8 miles north of the solar generation site.

The purpose of the project is to develop a renewable energy power plant that will help meet the State's Renewable Energy Portfolio goals and the Legislative findings expressed in NRS 704.825 – to meet the growing need for energy in the State.

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[1] NAC 703.160(4)(a) A title that generally describes the relief requested

[2] NAC 703.160(4)(b) The name of the applicant, complainant, petitioner or the name of the agent for the applicant, complainant or petitioner

[3] NAC 703.160(4)(c) A brief description of the purpose of the filing or proceeding, including, without limitation, a clear and concise introductory statement that summarizes the relief requested or the type of proceeding scheduled and the effect of the relief or proceeding upon consumers

The project site is located on land managed by the U.S. Bureau of Land Management (BLM). The BLM will conduct its environmental analysis pursuant to the National Environmental Protection Act and determine the grant of a Right of Way. Upon completion of the Final Environmental Impact Statement, Applicant will file an amended application with the Commission as required by NRS. Applicant requests the Commission accept and grant the application to construct under UEPA.

LOCATION OF FILED APPLICATION[4]

The UEPA application and Commission's file is maintained by the Public Utility Commission of Nevada.

THE DRAFT NOTICE DOES NOT PERTAIN TO A TARIFF FILING[5]

The UEPA application by Tonopah Solar Energy, LLC does not pertain to a tariff filing.

A CONSUMER SESSION IS NOT REQUIRED[6]

The Tonopah Solar Energy, LLC, UEPA application does not require a consumer session be held. NRS 704.069 states in pertinent part, "...the Commission shall conduct a consumer session... in any matter pending before the Commission pursuant to NRS 704.061 to 704.110 inclusive." The UEPA application, as proposed by Tonopah Solar Energy, LLC, does not meet any of the criteria within the pertinent statutes requiring a consumer session.

[4] NAC 703.160(4)d
[5] NAC 703.162
[6] NAC 703.164

SECTION 2.0
UEPA Application

STATE OF NEVADA
PUBLIC UTILITIES COMMISSION OF NEVADA

In the Matter of: Application of Tonopah Solar Energy LLC, for a permit to Construct the Crescent Dunes Solar Energy Project Pursuant to the Utility Environmental Protection Act	DOCKET NO. _____ **APPLICATION FOR A PERMIT TO CONSTRUCT UNDER THE UTILITY ENVIRONMENTAL PROTECTION ACT**

Applicant, Tonopah Solar Energy, LLC, ("Tonopah Solar") by and through the undersigned and in accordance with the Nevada Revised Statutes ("NRS"), and the Nevada Administrative Code ("NAC"), hereby files with the Public Utilities Commission of Nevada ("Commission") an Application for a Permit to Construct pursuant to the Utility Environmental Protection Act ("UEPA") set forth in NRS 704.810 through 704.900.

The State of Nevada has established the UEPA application procedure by which a utility facility, as defined under NRS 704.860, must apply for and receive a UEPA permit prior to commencement of construction. The UEPA process is a two-step application procedure when a federal agency is required to conduct an environmental analysis.[7] The initial UEPA application must provide a general description of the proposed facility as well as a summary of any studies that the Applicant anticipates will be made regarding the environmental impact of the facility.[8] Within 30 days of the issuance of the Final Environmental Impact Statement by BLM, the Applicant is required to file an amended UEPA application with the Commission.[9] The application for a Right of Way with the BLM includes submittal of a detailed Plan of Development (POD) which sets forth a detailed description of the project including how the facility will be constructed and operated. [10] Tonopah Solar Energy, LLC has recently submitted a POD to the BLM. A copy of the POD is included as an attachment to this application. This application has been structured in accordance with the NRS and NAC using the POD as the guiding document.

[7] NRS 704.870 et seq.
[8] NRS 704.870(2)(a)(1), (2).
[9] NRS 704.870(2)(b).
[10] Preliminary Plan of Development attached herewith as ATTACHMENT 1 (Final, with updated figures and maps, to be submitted in Amended UEPA); and BLM Form 299 Application for Right of Way, ATTACHMENT 2.

Tonopah Solar Energy, LLC, a solely owned subsidiary of SolarReserve, Inc., will construct, operate and maintain an electric power solar generating facility located in the State of Nevada. More specifically, the proposed project will be a concentrated solar electric generating facility on a site located in an area approximately 12 miles northwest of Tonopah, Nevada within a portion of Nye County. The project will be capable of producing approximately 500 gigawatt-hours (GWh) of renewable energy annually, with a nominal net generating capacity of 100-180 megawatts (MW).

The proposed solar power project is based on concentrating solar power (CSP) technology which utilizes heliostats/reflecting mirrors to redirect sunlight on a receiver erected in the center of the solar field (the power tower or central receiver). A heat transfer fluid (HTF) is heated as it passes through the receiver and then circulated through a series of heat exchangers to generate high pressure superheated steam. The steam is then used to power a conventional Rankine cycle steam turbine/generator, which produces electricity.

The land necessary for construction of the proposed solar power plant, including the heliostat array, power block, and associated facilities consists of approximately 1,600 acres of the 7,680 acres set aside for the project. The proposed boundaries are currently in excess of the minimum needed to site the facility in order to allow the applicant the flexibility to adjust the location of the central tower based on the results of soils/geotechnical, cultural, and biological baseline studies.

It is anticipated that the proposed project will interconnect to the existing Sierra Pacific Power Company Anaconda Substation (ROW 033242) that is located approximately 8 miles north of the Site. A new transmission line will be constructed between the Site and the substation. The proposed route for the outgoing transmission line will follow the site access road to Pole Line Road, head north along Pole Line Road to where the Millers to Anaconda transmission line is located, and then parallel the Millers to Anaconda transmission line to the Anaconda Substation, where it will interconnect with the electricity grid. The goal of this project is to produce and supply solar-generated renewable energy to the Nevada Utilities. A more detailed description of the project is contained in Section 5.0 below and the POD which is attached to this Application.

Tonopah Solar Energy, LLC requests that the Commission accept this UEPA Application for Permit to Construct as complying with the statutory and regulatory requirements set forth above. Upon completion of the BLM Final EIS, Tonopah Solar Energy, LLC will submit the required amended UEPA Application to the Commission and request approval for a Permit to Construct the proposed project pursuant to NRS 704.8905.

GENERAL ALLEGATIONS

1. At the time of this filing Tonopah Solar Energy, LLC is a private, for-profit company; licensed in the State of Nevada.

2. Tonopah Solar Energy, LLC's principal place of business, mailing address and telephone number are:

TONOPAH SOLAR ENERGY, LLC
2425 Olympic Blvd., Suite 500 East
Santa Monica, California 90404

T: 310.315.2200

3. All correspondence related to this Application (copies of pleadings, notices, orders and discovery requests), should be sent to the undersigned representative whose name and address is set forth below.

TONOPAH SOLAR ENERGY, LLC
Julie Way, Director of Development
2425 Olympic Blvd., Suite 500 East
Santa Monica, California 90404

T: 310.315.2235
F: 310.315.2201

AUTHORITY

4. This Application for the Tonopah Solar Energy, LLC project is filed in accordance with the Commission's regulations governing pleadings (NAC 703.530 et seq), the Utility Environmental Protection Act ("UEPA") (NRS 704.820 to 900), specifically NRS 704.870 (2)(a) time of filing application when there is a Federal agency involved, NRS 704873 (Commission has exclusive jurisdiction to determine need for utility facilities), and NRS 704. 890 (Grant or denial of application, required findings and modifications), and the Commission's regulations governing construction of utility facilitates (NAC 703.415 to 427), specifically, NAC 703.420 (Application for permit and amended application).

5. The Division of Environmental Protection is designated as a party to this proceeding, pursuant to NRS 704.885.1 (b), and will be served a copy of this application pursuant to NRS 704.870(3), simultaneously with this filing.

PRAYER FOR RELIEF

Wherefore, Tonopah Solar Energy, LLC, respectfully requests the Commission

A. Accept this initial UEPA Application as complying with NRS 704.870(2)(a), and NAC 703.421 pursuant to which an amended UEPA Application requesting approval of a permit to construct will be filed in accordance with NRS 870.2 (b) after the BLM's Final EIS is complete.

B. Grant such deviations from the Commission's regulations as may be in the public interest.

C. Grant Tonopah Solar Energy, LLC, such other and further relief as the Commission may find reasonable and appropriate under the circumstances.

RESPECTFULLY SUBMITTED, this 10th day of July 2009.

By _____
Julie Way, Director of Development
Tonopah Solar Energy, LLC

SECTION 3.0

Executive Summary

The proposed project will be a concentrating solar electric generating facility on a site located in an area northwest of Tonopah, Nevada within a portion of Nye County. The project will be capable of producing approximately 500 gigawatt-hours (GWh) of renewable energy annually, with a nominal net generating capacity of 100-180 megawatts (MW).

SolarReserve's technology is a concentrating solar power (CSP) technology, utilizing a central receiver/tower and equipped with an integral thermal storage system. The proprietary receiver and storage components are provided through an exclusive license with United Technologies Corporation subsidiary Hamilton Sundstrand Rocketdyne ("UTC" or "Rocketdyne").

The proposed project generates power from sunlight by focusing energy from a field of sun tracking mirrors called heliostats onto a central receiver. Liquid salt, which has the viscosity and appearance similar to water when heated, is circulated through tubes in the receiver, collecting the energy gathered from the sun. The heated salt (1000 degrees plus) is then routed to an insulated storage tank where it can be stored with minimal energy losses. When electricity is to be generated, the hot salt is routed to a heat exchanger (or steam generator) and used to produce steam, which generates electricity in a conventional steam turbine cycle. After exiting the steam generator, the liquid salt is sent to the "cold" salt thermal storage tank (500 degrees plus) and the cycle is repeated. The salt storage technology was demonstrated successfully at the Solar Two facility in Barstow, CA in the late 1990's.

The benefits of this unique technology are as follows:

First, salt in the liquid state has highly efficient heat transfer and storage properties. Because the salt is used as the heat transfer medium in the cycle, no natural gas is required for startup or to maintain steam cycle conditions during cloud cover, as with some other solar technologies.

Second, because the salt stores energy, the stored energy can be extracted upon demand to produce electricity even when there is no sunlight.

Third, the storage capability also provides flexibility to generate electricity in large quantities for short periods of time or in smaller quantities over longer periods of time, thereby offering the ability to match the seasonal and varying electricity demands of the state.

The primary objective for the proposed project is to construct, operate and maintain an efficient, economic, reliable, safe and environmentally-sound, solar-powered generating

facility. The site selected is located in an area within the state where excellent solar resources exist. In addition to a world-class resource, the Nevada solar market is being driven by the Renewable Portfolio Standard (RPS) adopted by the Nevada legislature. Under the standard, the State's investor-owned utilities must use eligible renewable energy resources to supply a minimum percentage of the total electricity they sell. The RPS requires Nevada's electric utilities to generate or acquire a minimum of 5 percent of electricity sold to retail customers from renewable energy systems in 2003 and 2004, and increases the standard by 2 percent biennially to 15 percent by 2013.

The solar facility will have the following features:

- A large field of heliostats or mirrors to reflect the sun's energy onto a central receiver or tower
- A conventional steam turbine to generate electricity
- Thermal storage tanks to store the hot and cold liquid salt
- A hybrid cooling system (i.e. an air cooled condenser with a wet cooling augmentation system designed to minimize water consumption by use only during times of high electricity demand)
- Associated equipment such as pumps, transformers, heat exchangers, and buildings
- Associated linear facilities including a transmission line and an access road

SECTION 4.0

General Description of the Location of the Proposed Facility

The proposed project Site is located in south-central Nevada in the northern part of Nye County. Located on lands administered by the Bureau of Land Management (BLM), the project area under application with the BLM encompasses 7,680 acres, bounded as: Township 4 North, Range 41 East, Sections 2, 3 and 10 – 15, and Township 5 North, Range 41 East, Sections 26, 27, 34, and 35. (As shown on the Site Map, Attachment 2)

The land necessary for construction of the proposed solar power plant, including the heliostat array, power block, and associated facilities consists of approximately 1,600 acres located within the land boundaries described above. The proposed boundaries as filed in the SF-299 application are currently in excess of the minimum needed to site the physical equipment. Because the project is at the preliminary project design stage, the additional land will allow the applicant the flexibility to adjust the location of the central tower based on the results of soils/geotechnical, cultural, and biological baseline studies and then determine an adequate buffer between plant facilities and any adjacent uses before finalizing the equipment location within the Right-of-Way (ROW), reducing the area to be granted in the final ROW and finalizing the plant boundaries.

Section 4.1

Project Location Map

See Location Map: Attachment 3

Section 4.2
Site Map

See Site Map: Attachment 4

Section 4.3

Alternatives

Solar project sites are selected for meeting a specific set of criteria including:

- Sites receiving long periods of sustained sunshine without frequent occurrences of inclement weather, cloud cover or dust;
- Sites with relatively level ground/surface;
- Large contiguous sites away from light interference caused by buildings and forestation;
- Close proximity to an electric transmission line; and
- Sites with good access for construction, operation and maintenance activities.

In this case, alternate sites were analyzed for feasibility but were eliminated. These sites were also located in Nye County. The other sites considered had similar site characteristics to the proposed site but were not carried over for further evaluation in order to respond to concerns raised by Nellis Air Force base related to a potential to affect military operations.

Section 4.4

Project Site Benefit

The primary objective for the proposed project is to construct, operate and maintain an efficient, economic, reliable, safe and environmentally-sound, solar-powered generating facility. The site selected is located in an area within the state where excellent solar resources exist. According to the National Renewable Energy Laboratory United States Solar Atlas, the project area maintains high insolation levels on a year-round basis, creating ideal conditions for solar energy generation.

In addition to a world-class resource, the Nevada solar market is being driven by the Renewable Portfolio Standard (RPS) adopted by the Nevada legislature. Under the standard, the state's investor-owned utilities must use eligible renewable energy resources to supply a minimum percentage of the total electricity they sell. The RPS requires Nevada's electric utilities to generate or acquire a minimum of 5 percent of electricity sold to retail customers from renewable energy systems in 2003 and 2004, and increases the standard by 2 percent biennially to 15 percent by 2013.

The Nevada State Public Utilities Commission has established an RPS (NRS 704.7821) for Sierra Pacific and Nevada Power that requires 20% of the total amount of electricity sold by them to retail customers be generated from renewable energy sources by the year 2015. Currently, there is no commercially produced solar energy in Nevada. An additional benefit from this project is helping Nevada become more energy independent and help meet green energy goals in the future

SECTION 5.0

General Description of Proposed Facility

The overall site layout for the proposed facility includes the following components:

The solar array will be a circular field with a radius of approximately 4,500 feet where the heliostats are located. The power block, a circle with a radius of about 400 feet which houses the central receiver tower, storage tanks, steam turbine, hybrid cooling system, transformers, heat exchangers, power block buildings, and other ancillary equipment. An administration building, warehouse, and evaporation ponds will be located along the outside perimeter of the solar array. Associated linear facilities, including transmission and an access road will also be employed.

Solar Field

A solar power tower/central receiver system generates electric power from sunlight by focusing concentrated solar radiation on a tower-mounted receiver. The system uses thousands of sun-tracking mirrors called heliostats, which are arranged concentrically around the central receiver tower and reflect the incident sunlight onto the receiver.

The proposed facility will consist of up to approximately 17,350 heliostats occupying approximately 1,600 acres. Each heliostat will be approximately 670 square feet in size, yielding a total reflecting surface of about 12,000,000 ft^2 (1,100,000 m^2).

The arrangement of the heliostats within the array is optimized to maximize the amount of solar energy that can be collected by the field and arranged to avoid interference among heliostats as they track the sun during the day. The heliostats will be arranged in arcs around the solar receiver asymmetrically, as described below.

The first row or line of heliostats has a radius of approximately 420 feet.
The longest arc/line of heliostats, with a radius of approximately 5,100 feet, is in the northern section of the heliostat array. This is due to the greater collection efficiency of heliostats located north of the receiver tower for sites in the northern hemisphere of the world. With the sun predominantly in the southern sky, the cosine effect of incidence and reflection angles are less in the northern heliostats than in the southern ones. The converse – lower collection efficiency in the southern section – is also true; therefore, the maximum southern arc radius is the shortest, 3,580 feet, and the southern heliostat field is the smallest.

The eastern sector of the heliostat is more valuable than the western sector for energy collection because afternoon energy collection, during on-peak utility hours, is more valuable than morning energy collection, during part-peak or off-peak hours. The maximum eastern row arc radius may therefore be greater than the maximum western row arc radius.

Central Receiver/Tower

The tower is a concrete structure, approximately 538 feet high, which supports a cylindrical receiver, approximately 95 feet tall, mounted on the top of the tower. The receiver is composed of tube panels through which the liquid salt or HTF flows. Therefore, the top of the receiver will be at a height of approximately 633 feet. A maintenance crane will also be mounted on top of the receiver, which is expected to be 20 feet tall.

Power Block

The power block will include a steam turbine generator, multiple feedwater heaters, steam superheaters, lubricating oil system, hydraulic control system, valving, and feedwater pumps. Steam is generated at a temperature and pressure of 1,030°F and 1685 psia before entering the high-pressure section of the turbine. Steam exiting the high-pressure section of the turbine is reheated to increase its temperature before entering the immediate-pressure section of the turbine. Exhaust steam from the turbine is directed to the hybrid condenser. The turbine drives a generator, which delivers electrical power via a main step-up transformer in the on-site substation to the utility grid. Extraction steam from the steam turbine is used to preheat the feedwater and for deaerating the feedwater.

This high-efficiency turbine is designed for reliable operation under conditions of daily start up and shutdown over the life of the plant. The solar field and power generation equipment may be started each morning after sunrise and insolation build-up. The solar field will shut down in the evening as the sun sets though the integral thermal energy storage system will allow the steam turbine to continue operating if there is demand for electricity.

The primary components of the power block include:

- Solar Steam Generator System – The steam generator is the core of the steam supply system for the power block. The steam generator system includes a pre-heater, evaporator, superheater, reheater, and steam drum. High pressure feedwater enters the steam generator from the preheaters and leaves as saturated steam that subsequently flows to the superheaters.
- Solar Preheater – The solar preheaters are of a shell and tube design. High pressure feedwater enters the preheaters from the low pressure feedwater heaters and leaves as high pressure feedwater.
- Evaporator – The evaporator receives heated, high pressure water from the preheater and evaporates the water into saturated steam. The evaporator is of a shell and tube design.
- Solar Superheaters/Reheaters – The saturated steam flows to a shell and tube superheater to reach the desired steam-turbine temperature and pressure-operating conditions. The reheater receives "cold" outlet steam from the high-pressure

turbine stage and reheats the steam before being reintroduced into the intermediate-pressure stage of the turbine.

- Steam turbine – Once the pressurized steam has reached the optimum temperature in the superheater, it flows to the steam turbine, which extracts thermal energy from the steam.
- Feedwater heaters – The feedwater is heated to the required conditions using conventional turbine extraction steam in low pressure feedwater heaters.
- Deaerator – A direct contact steam deaerator will be included to eliminate dissolved oxygen in the condensate and steam.
- Cooling System

Thermal Storage System

The thermal storage system utilizes hot and cold liquid salt tanks to store solar heat energy for later steam generation as well as associated pumps and piping. Thermal storage provides the facility with several enhancements. The solar field is nominally sized to provide excess solar energy to the system during summer months, and such sizing intentionally results in collection of excess heat that cannot be utilized instantly by the power block. The thermal storage capability allows the excess heat to be stored until utilized for power generation. Thermal storage can also extend the generation day of SolarReserve power plants. The heated salt can be stored in insulated tanks to provide a steam heating source after the sun sets, allowing the facility to more closely satisfy the load demands of the electricity grid system, which typically peak in the late afternoon and evening hours. The thermal storage system includes an auxiliary electric heat source to keep the salt in a molten state through protracted maintenance outages.

The thermal storage system contains two storage tanks – one "cold" tank storing liquid salt at 550°F and one "hot" tank storing liquid salt at 1,050°F. As the sun rises, cold liquid salt (or HTF) is pumped from the cold liquid salt tank through the tubes inside the receiver. After absorbing energy from the concentrated sunlight, the temperature of the HTF is increased to the design outlet temperature of 1,050°F. Part of the heated HTF is then pumped to a hot liquid salt tank for storage and part to a steam generating system that produces superheated steam for use in the conventional Rankine cycle turbine/generator system. This arrangement allows for excess heat to be stored for power generation outside of the direct solar-heating period of the day. After exiting the steam generator, the HTF is returned to the cold tank where it is stored and eventually reheated in the receiver.

Section 5.1
Proposed Size of Facility

The land necessary for construction of the proposed solar power plant, including the heliostat array, power block, and associated facilities consists of approximately 1,600 acres located within the 7,680 acres of land described above in Section 4.0. The specific footprint within the general location will be finalized during the BLM's EIS process.

The solar array will be a circular field with a radius of approximately 4,500 feet where the heliostats are located. A solar power tower/central receiver system generates electric power from sunlight by focusing concentrated solar radiation on a tower-mounted receiver. The system uses thousands of sun-tracking mirrors called heliostats, which are arranged concentrically around the central receiver tower and reflect the incident sunlight onto the receiver. The proposed facility will consist of up to approximately 17,350 heliostats occupying approximately 1,600 acres. Each heliostat will be approximately 670 square feet in size, yielding a total reflecting surface of about 12,000,000 ft^2 (1,100,000 m^2).

Associated linear facilities, including transmission and an access road will also be employed.

Section 5.2

Natural Resources Used During Construction / Operation

An environmental analysis will be conducted during the EIS process under the jurisdiction of the BLM. All the studies evaluating potential environmental impacts of the proposed facility will be included in the BLM's Final EIS describe the existing environmental characteristics of the region and site including the identification of resources present that have the potential to be affected by the project in both construction and operation. In order to facilitate further participation in the EIS process, Tonopah Solar Energy, LLC will amend this UEPA Application shortly after BLM publishes its Draft EIS. [See also Section 6.0: Environmental Statement]

Section 5.3
Summary of Studies

Consultation with various agencies and the BLM during the EIS process will determine which studies will be required. A cultural resource evaluation and some wildlife studies have been started for the project site by Applicant in order to have sufficient time to gather the appropriate level of data for the impact analysis to be conducted during the EIS process. Environmental consequences to these resources will be analyzed by the BLM and the conclusions will be included in the EIS document.

All studies and supporting documents will be included or referenced in the Final EIS. The Final EIS will be submitted with the amended UEPA Application not later than 30 days after its issuance pursuant to NRS 704.870(2)(b).

Section 5.4

Solar Tower and Solar Field

The tower is a concrete structure, approximately 538 feet high, which supports a cylindrical receiver, approximately 95 feet tall, mounted on the top of the tower. The receiver is composed of tube panels through which the liquid salt or HTF flows. Therefore, the top of the receiver will be at a height of approximately 633 feet. A maintenance crane will also be mounted on top of the receiver, which is expected to be 20 feet tall.

The heliostat assemblies consist of glass mirror modules, structural support components, motor drives, a heliostat controller and a foundation that will be mounted on steel or concrete foundations. The geotechnical information and the potential pile test program will provide the information necessary to determine the most cost effective foundation design. The most likely foundation design will be a reinforced concrete pier foundation that is cast in a drilled hole. Alternate foundation types to be evaluated include concrete or steel piles.

Section 6.0
Environmental Statement

No major natural resources from the project area will be required for the construction, operation and maintenance of the proposed facility. Potentially some rock and fill material may be needed to improve road conditions, create engineered pads for the heliostats, and make concrete, but this will be further evaluated in the EIS document.

As to particular impacts to the environment, the potentially affected natural resources will be evaluated in the Environmental Impact Statement (EIS). Studies of these resources and an impact analysis will be conducted and mitigation measures or project design parameters will be developed to offset any significant impact if feasible. All studies and supporting documents will be included or referenced in the Final EIS and submitted with the amended UEPA Application not later than 30 days after its issuance pursuant to NRS 704.870(2)(b).

Resource areas that will be evaluated in the EIS process include:

Biological Resources

Biological resources potentially affected by the proposed project include vegetation, wildlife, corridors, and riparian resources. Potential impacts to these resources may be either directly or indirectly impacted by the project and may be either permanent or temporary in nature. Surface disturbance that removes vegetation and disturbs the soil is considered a long-term temporary impact because of slow natural recovery in arid ecosystems. Therefore, all such impacts in the project area are considered permanent.

Although no channels or drainages appear to be present on the Site, shallow channels may convey flow during storm events and spring runoff. During the general survey process, any jurisdictional wetlands/waters detected on the Site will be formally delineated per Army Corps of Engineers (ACOE) protocol. If any are identified and determined to be jurisdictional, permits for impacts to jurisdictional waters would be required.

A review of the Tonopah Resources Management Plan indicates that the Site contains a salt desert shrub vegetation type. The Tonopah Resource Area is comprised of a broad range of individual and overlapping types of wildlife habitat including mule deer, antelope, desert bighorn sheep, rocky mountain elk, waterfowl, sage grouse and raptors. There are several special status species, both plant and animal, in the Resource Area including the Williams combleaf (*Polyctenium williamsiae*), desert tortoise (*Gopherus agassizii*) and Railroad Valley springfish (*Crenichthys nevadae*). Focused surveys, agency consultation, project planning, design and permitting, and implementation of appropriate mitigation measures will ensure that potential impacts to biological resources are either avoided and/or minimized to the maximum extent feasible.

Cultural Resources

Ground-disturbing construction activities have the potential to directly impact cultural resources by altering site integrity and the qualities that make the resources significant. In addition, in the case of built resources, impacts can occur to the setting of a resource, even if the resource is not physically damaged.

The Proposed Tonopah Resource Management Plan and Final Environmental Impact Report (BLM 1994) indicates that some prehistoric site types are known to occur in the area. Accordingly, prior to Site construction, the applicant would survey the Site and inventory and evaluate any cultural resources. Appropriate consultation including BLM consultation with the State Historic Preservation Office (SHPO) and Native Americans in addition to project planning and design, and implementation of relevant mitigation measures will ensure that potential impacts to cultural resources are either avoided and/or minimized to the maximum extent feasible.

Land Use

The proposed project is located on unincorporated lands administered by the BLM within Nye County, Nevada. The project area is guided by the Tonopah Planning Area Proposed Resources Management Plan/Final Environmental Impact Study (PRMP/FEIS). The Tonopah RMP was approved in October 1997 and is scheduled for revision beginning Fiscal Year 2009. Based on a review of the PRMP, the project Site appears not to be subject to any grazing allotments, herd management area boundaries, right-of-way avoidance areas, withdrawals, areas of critical environmental concern (ACEC), recreation opportunity spectrums, fluid mineral potential, mineral leasing restrictions, or fire management zones. Development of the proposed project and any existing land use restrictions would be discussed with the BLM prior to environmental review.

Native American Tribal Considerations

As with any project site, the potential also exists for resources to be unearthed during project construction. As such, during the planning and permitting process, BLM consultation with Native Americans in compliance with Executive Orders regarding Government-to-Government relations with Native Americans and other federal and state laws and regulations would take place.

Recreation and OHV Conflicts

The Tonopah Resource Management Area offers a wide variety of recreation opportunities such as hunting, camping, off-highway vehicle (OHV) use, hiking, photography, historical sightseeing, and OHV competitive events.

Further research would be conducted to determine if any recreational or OHV conflicts are present immediately on the project Site or in the immediate surrounding project area.

Other Environmental Concerns

Aesthetics

The project will change the visual appearance of the area. When viewed from eye level, during most hours of the day, the solar field would be relatively unobtrusive, with the power block only slightly visible in the distance (if at all), and the view of the project will be dominated by the central tower and receiver. Operations would require onsite nighttime lighting for safety and security. To reduce offsite lighting impacts, lighting at the facility would be restricted to areas required for safety, security, and operation. Exterior lights would be hooded, and lights would be directed onsite so that light or glare would be minimized. Low-pressure sodium lamps and fixtures of a non-glare type would be specified. Switched lighting would be provided for areas where continuous lighting is not required for normal operation, safety, or security; this would allow these areas to remain un-illuminated (dark) most of the time and thereby minimizing the amount of lighting potentially visible offsite.

Project construction activities typically would occur during normal Monday through Friday working hours, although nighttime activities may occur at certain times during the construction period depending on the project schedule. When and if nighttime construction activities take place, illumination would be provided that meets State and Federal worker safety regulations.

Construction of the project's transmission line would involve installation of wood, concrete or steel power poles. The insulators will be made of a non-reflective and non-refractive material, and the conductors will be non-specular (i.e., their surfaces will have a dulled finish so that they do not reflect sunlight). The proposed routing would follow the existing lines.

The BLM evaluates federally-managed lands under its Visual Resources Management (VRM) system. The proposed project Site is located in an areas designated by the BLM as Visual Resource Management (VRM) Class IV (BLM, 1994). The BLM's objective on VRM Class IV lands is to provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. BLM-managed lands within the Site will be managed as Class IV under the Tonopah RMP/FEIS; therefore, visual resource management is not expected to hinder solar facility development within the Site.

Air Quality

Ambient air quality is protected by Federal, State, and local regulations. The EPA has established National Ambient Air Quality Standards (NAAQS) for criteria pollutants for the purpose of protecting human health (primary standards) and public welfare (secondary standards). These criteria pollutants are: nitrogen dioxide (NO_2), carbon monoxide (CO), ozone, SO_2, lead (Pb), PM_{10}, and $PM_{2.5}$. The EPA established designations for a new 8-

hour ozone standard, which are now in effect while the 1-hour ozone standard was revoked on June 15, 2005 in most areas, including the Project area. In addition to the Federal NAAQS, State ambient air quality standards have been established for Nevada. The Nevada ambient air quality standards are the same as the Federal standards.

The proposed project will generate air emissions during both construction and operation. Construction emissions for the proposed project will be closely evaluated using site- and project-specific data during the project design, permitting and certification process. The main sources of emissions from the proposed project would be short-term emissions during construction. Construction-related emissions will include the exhaust from construction equipment (including vehicles transporting personnel, equipment, and supplies) and fugitive dust and particulate matter (PM_{10}) from grading, earth moving, and equipment/vehicles traveling on paved and unpaved roads.

The Applicant will obtain the necessary construction and operation permits from the BAPC/NDEP. The Applicant will also work with the BAPC/NDEP to determine any needed mitigation measures.

Geologic Hazards and Soils

According to the BLM Tonopah Field Office PRMP/FEIS (1994), the soils in the RMP area are mainly mineral soils of two types: those which do not have water continuously available for three months when the soil is warm enough from plant growth (Aridisols) and soils showing little evidence of the soil forming process, the development of horizons or layers (Entisols). The surface soils on the Site are characterized by sandy-clay and wind-eroded gravels. The areas of undisturbed surface gravels are stable and tend not to be dust producing. Areas of disturbance could become dusty or muddy.

Design of the project would include appropriate measures to mitigate for any hazards identified during the assessment, including dust suppression.

An engineering geologist(s), certified by the State of Nevada, would be assigned to the project to carry out the duties required by the Nevada Building Code (NBC), including preparation of an Engineering Geologic Report, and to periodically monitor geologic conditions during construction, approve actual design features and mitigation measures used to protect the project from geologic hazards and prepare the final Geologic Grading Report.

Mineral and Energy Resources

The state of Nevada is a large producer of gold as well as oil and gas. In addition, Nevada has the largest BLM mineral management program. The state is also a producer of geothermal energy. A variety of mineral resources are present in the Resource Area including sand and gravel, cinders, basalt, and decorative rock. Further study of the

mineral and energy resources located both on and near the Site would be contained in future analyses.

Noise

The proposed project is located in an undeveloped area where existing noise levels are likely to be relatively low. Noise sensitive receptors can include facilities or areas where excessive, disconcerting, or high levels of noise would conflict with the intended use (e.g., residential areas, hospitals, schools, certain recreation areas, etc.). No sensitive receptors exist within the sites audible influence.

Further research will be conducted to determine current noise emissions in the project vicinity and the impact of the proposed project on the noise environment. Project design and mitigation measures will be incorporated as needed.

Water Resources

The project Site is not impacted by obvious drainage pathways. Areas near the Site contain small drainage scars which are periodically wet and may contain water for extended periods during spring runoff. Drainage from this area is primarily shallow sheet flow, infiltration and evaporation. The perennial yield (safe yield) of the Tonopah Flat groundwater basin sub area is reportedly 6,000 acre-feet per year and the total water rights demand through March 1999 was reportedly 26,724 acre-feet per year.

Although there is an apparent groundwater deficit, the estimated committed water rights in the sub area do not represent the actual groundwater withdrawal and consumption, which are significantly less (Buqo, 2004). The actual groundwater budget in the Tonopah Flat groundwater basin sub area is being reviewed at this time.

Because the facility will utilize a hybrid cooling technology the total process and operational water demand is expected to use up to approximately 700 afy. Groundwater would be utilized to meet this demand.

The anticipated construction water demand is approximately 900 afy over the course of the 30-month construction schedule. Construction water demand would be met by pumping groundwater on-site, or through off site wells on a temporary basis.

SECTION 7.0

Agency Approvals/ Required Permits

The following chart provides a list and brief description of all potential agency approvals and regulatory permits required to fully construct the Tonopah Crescent Dunes Project.

See Attachment 5

SECTION 8.0

Public Interest, State Benefit and Need for the Proposed Facility

The project offers the following key benefits:

The proposed solar facility is expected to generate approximately 500,000 MWh per year and displace the use of natural gas and associated carbon dioxide (CO_2 – a greenhouse gas) emissions produced by a modern high-efficiency natural-gas-fired and coal burning power plants to produce an equivalent amount of energy. The project will assist the State of Nevada in developing renewable sources of energy and displacing older conventional power generation.

The project will minimize the use of water by utilizing a hybrid cooling system.

The project can provide flexibility for state renewable power supplies by being able to generate a large quantity of electricity for a short period of time or a smaller quantity of electricity over a longer period of time without changing the size of the solar array.

The project is expected to promote economic development by creating approximately 40-45 permanent jobs and up to 400-500 peak construction jobs

The project is designed to meet the increasing demand for clean, renewable electrical power. Development of solar resources reduces reliance on foreign sources of fuel, promotes national security, diversifies energy portfolios and contributes to the reduction of greenhouse gas emissions. Nevada has enacted a renewable portfolio standard (RPS) as part of its 1997 restructuring legislation. The RPS requires Nevada's electric utilities to generate or acquire a minimum of 5 percent of electricity sold to retail customers from renewable energy systems in 2003 and 2004, and increases the standard by 2 percent biennially to 15 percent by 2013. Construction and operation of the project will contribute to achieving Nevada's RPS goals as well as providing jobs in the local economy.

In addition to its environmental attributes, the project will contribute much needed on-peak power to the electrical grid that serves the western United States. The demand for power continues to grow in these states. As older technology fossil-fuel plants reach the end of their useful lives there is a benefit in replacing them with clean, reliable energy sources.

The project responds to this public interest as well as the State economics and need.

SECTION 9.0
Reliability of Utility

As stated above, the Nevada Legislature has mandated certain RPS goals to meet the complimentary and convergent policies of the State. These policy requirements will become increasingly more difficult to meet as the population and energy load demand of the State increase.

It is the goal of the Crescent Dunes Solar Energy Project to produce and supply solar-generated renewable energy to the Nevada Utilities for a prolonged period. Tonopah Solar Energy, LLC is currently pursuing a power purchase agreement with NV Energy so that the energy generated at the Crescent Dunes Solar Energy Project will be fed into the local grid and, as such, will enhance the reliability of electricity in this State.

Due to the nature of solar energy generation, the renewable source itself is expected to last indefinitely. With the particular technology employed in this project, not only will renewable energy production occur during daylight hours, but with the storage capacity of the molten salt, power can be sent to the grid after sundown; also enhancing the reliability of the electricity needs in the State of Nevada.

The proposed Crescent Dunes Solar Energy Project will provide regional utilities with renewable and sustainable energy which will enhance the reliability of the Western Interconnection and help to meet the reliability needs of the State.

SECTION 10.0

Public Notice Proof of Publication

Tonopah Times-Bonanza and Goldfield News
Published July 2, 2009

- Affidavit follows on next page

Affidavit of Publication

State of Nevada, County of Nye

I, Phyllis Trice, Legal Clerk for the Tonopah Times-Bonanza & Goldfield News, a weekly newspaper published in Tonopah, Nye County, Nevada, being duly sworn, hereby certify that the following advertisement appeared in the Tonopah Times-Bonanza & Goldfield News:

NOTICE OF APPLICATION

A copy of the above-described advertisement is hereon attached. It was published in the Tonopah Times-Bonanza & Goldfield News on this date or dates:

July 2, 2009

Signed before a notary public:

Signature Phyllis Trice

Date July 2, 2009

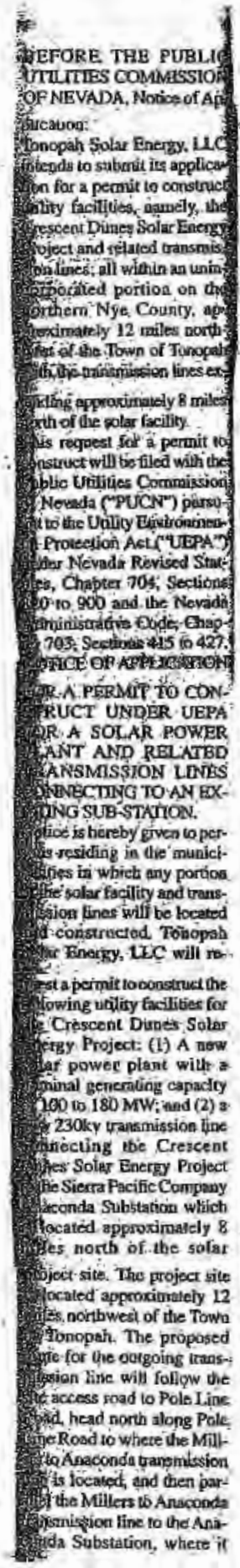
Subscribed and sworn to before this notary on this date:

Date July 2, 2009

Maxine Jordan

Notary Public Signature

MAXINE JORDAN
NOTARY PUBLIC
STATE OF NEVADA
APPT. No. 07-1652-14
MY APPT. EXPIRES JAN. 30, 2011



BEFORE THE PUBLIC UTILITIES COMMISSION OF NEVADA, Notice of Application:

Tonopah Solar Energy, LLC intends to submit its application for a permit to construct utility facilities, namely, the Crescent Dunes Solar Energy Project and related transmission lines; all within an unincorporated portion on the northern Nye County, approximately 12 miles northwest of the Town of Tonopah, the transmission lines extending approximately 8 miles north of the solar facility.

This request for a permit to construct will be filed with the Public Utilities Commission of Nevada ("PUCN") pursuant to the Utility Environmental Protection Act ("UEPA") under Nevada Revised Statutes, Chapter 704, Sections 820 to 900 and the Nevada Administrative Code, Chapter 703, Sections 415 to 427.

NOTICE OF APPLICATION FOR A PERMIT TO CONSTRUCT UNDER UEPA FOR A SOLAR POWER PLANT AND RELATED TRANSMISSION LINES CONNECTING TO AN EXISTING SUB-STATION.

Notice is hereby given to persons residing in the municipalities in which any portion of the solar facility and transmission lines will be located and constructed, Tonopah Solar Energy, LLC will request a permit to construct the following utility facilities for the Crescent Dunes Solar Energy Project: (1) A new solar power plant with a nominal generating capacity of 100 to 180 MW; and (2) a new 230kv transmission line connecting the Crescent Dunes Solar Energy Project to the Sierra Pacific Company Anaconda Substation which is located approximately 8 miles north of the solar project site. The project site is located approximately 12 miles northwest of the Town of Tonopah. The proposed route for the outgoing transmission line will follow the solar access road to Pole Line Road, head north along Pole Line Road to where the Millers to Anaconda transmission line is located, and then parallel the Millers to Anaconda transmission line to the Anaconda Substation, where it will interconnect with the electricity grid.

The Crescent Dunes Solar Energy Project and related transmission line will serve to meet the State of Nevada's Renewable Energy goals and portfolio standard. The renewable energy solar power project and associated transmission line will help serve to meet the electrical and transmission needs of the State.

The solar project is located on and administered by the U.S. Bureau of Land Management's ("BLM"). Battle Mountain District Offices. The BLM will conduct a thorough environmental analysis of the Crescent Dunes Solar Energy Project and transmission line, pursuant to the National Environmental Policy Act, and analyze the environmental impacts of the scope of the project and make a determination on whether or not to authorize the project and issue right-of-way grants. The elements of the initial UEPA application to be submitted to the PUCN for the Crescent Dunes Solar Energy Project will include: (1) a description of the location of the proposed solar power plant and related facilities requiring a permit to construct from the PUCN; (2) an environmental statement or summary of the studies which the BLM will conduct of the proposed utility facilities now proposed; and (3) a list of federal, state, regional and local agencies whose approval may be governed by the provisions of the UEPA. Protests and written comments about the granting of the UEPA application must be filed with the PUCN as provided by law. DATED this 30th day of June, 2009. Tonopah Solar Energy, LLC. PUBLISH: July 2, 2009.

Proof of Publication

BEFORE THE PUBLIC UTILITIES COMMISSION OF NEVADA, Notice of Application:

Tonopah Solar Energy, LLC intends to submit its application for a permit to construct utility facilities, namely, the Crescent Dunes Solar Energy Project and related transmission lines; all within an unincorporated portion on the northern Nye County, approximately 12 miles northwest of the Town of Tonopah with the transmission lines extending approximately 8 miles north of the solar facility.

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SECTION 11.0

Certification of Service

I hereby certify that on this 16th day of July, 2009, pursuant to NRS 704.870.3 and 704.870.4(a), I served the following persons and/or agencies with a copy of the Tonopah Solar Energy, LLC, APPLICATION FOR A PERMIT TO CONSTRUCT UNDER THE UTILITY ENVIRONMENTAL PROTECTION ACT (UEPA)

either by certified mail, or in person to:

Attention: Staff Counsel
Public Utilities Commission of Nevada
101 Convention Center Drive
Las Vegas, NV 89109

Mark Harris, Resource Planning
Public Utilities Commission of Nevada
1150 E. William Street
Carson City, NV 89701

Attention Staff Counsel
Public Utilities Commission of Nevada
1150 E. William Street
Carson City, NV 89701

Nevada State Clearinghouse
Dept. of Administration, Budget and Planning
209 E. Musser Street, Room 200
Carson City, NV 89701

Allen Biaggi, Director
Dept. of Conservation and Nat. Resources
901 S. Stewart Street, Ste. 5001
Carson City, NV 89701

Eric Witkoski, Chief Deputy Attorney General
Bureau of Consumer Protection
100 N. Carson Street
Carson City, NV 89701

Susan Dudley, Administrative Supervisor
Chris Mulkerns, Deputy Town Clerk
Town of Tonopah
P.O. Box 151
Tonopah, NV 89049

Leo Drozdoff, P.E. Administrator
Nevada Division of Environmental Protection
901 S. Stewart Street, Ste. 4001
Carson City, NV 89701

Sandra L. Merlino, County Clerk
101 Radar Road
P.O. Box 1031
Tonopah, NV 89049-1031

Brad Hardenbrook
Nevada Department of Wildlife
Southern Region, Las Vegas
4747 Vegas Drive
Las Vegas, NV 89108

/s/

Signature of person serving

UEPA Application
Tonopah Solar Energy, LLC
Crescent Dunes Solar Energy Project

PART 2: Attachments

ATTACHMENT 1: Preliminary Plan of Development

ATTACHMENT 2: BLM Form 299 Application for Right-of-Way

ATTACHMENT 3: Site Map

ATTACHMENT 4: Location Map

ATTACHMENT 5: Permit Matrix

ATTACHMENT 1

Tonopah Solar Energy, LLC

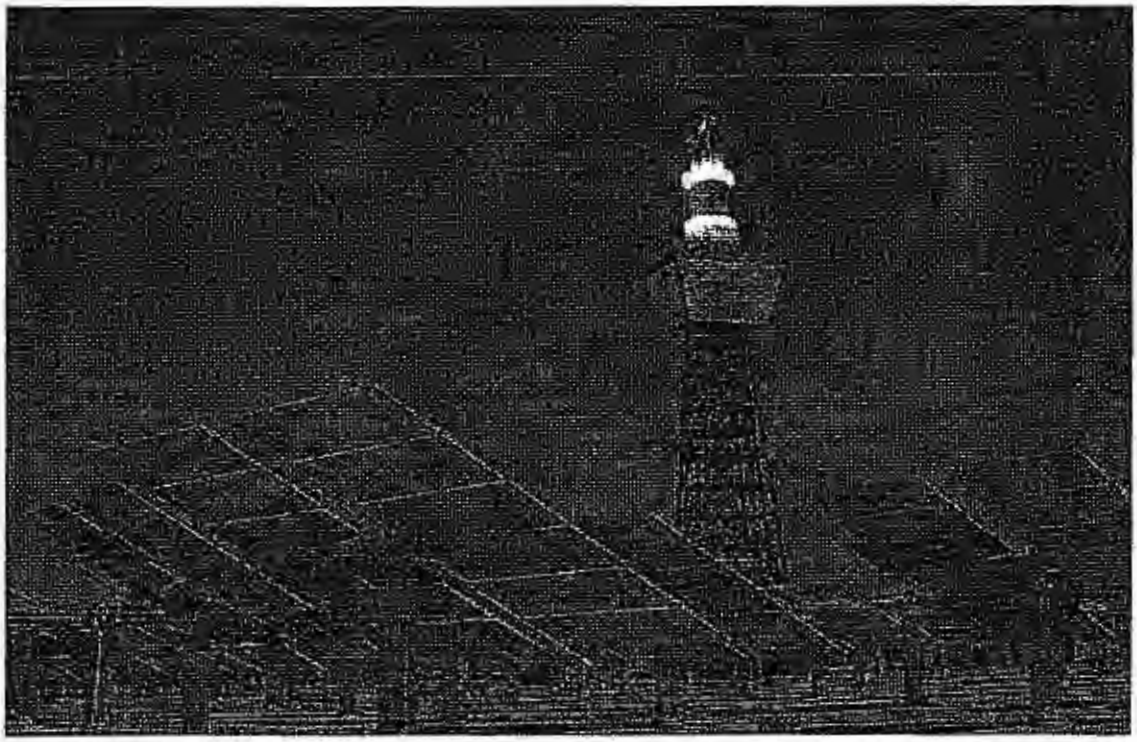
Crescent Dunes Solar Energy Project

N-86292

PLAN OF DEVELOPMENT

Submitted to:

BLM Tonopah Field Office
1553 South Main Street
Tonopah, NV 89049



Submitted By:

Tonopah Solar Energy, LLC
2425 Olympic Blvd., Suite 500 East
Santa Monica, California 90404

May 15, 2009

CONTENTS

Figures

Tables

Appendices

ACRONYMS AND ABBREVIATIONS

(A)	amp
AC	alternating current
ACC	air cooled condenser
ACEC	Area of Critical Environmental Concern
ACOE	Army Corps of Engineers
AF	acre-feet
Afy	acre-feet per year
ANSi	American National Standards Institute
ARPA	Archaeological Resource Protection Act
ASME	American Society of Mechanical Engineers
ASTM	American Society of Testing Materials
BAPC	Bureau of Air Pollution Control
BCS	beam characterization system
bgs	below ground surface
BLM	Bureau of Land Management
BMPs	best management practices
CAA	Clean Air Act
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CETF	Clean Energy & Technology Fund
cf	cubic feet
CFR	Code of Federal Regulations
CO_2	Carbon Dioxide
CO	Carbon Monoxide
CSP	concentrating solar power
DC	direct current
DCS	Design Control Systems
DESCP	drainage erosion sediment control plan
DHS	Department of Homeland Security
DoD	Department of Defense
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPCRA	Emergency Planning and Community Right-to-Know
ESA	Environmental Site Assessment
ESA	Endangered Species Act

F	Fahrenheit
FEIS	Final Environmental Impact Statement
ft^2	square feet
gal	gallon
GSU	generator step-up transformer
GWh	Giga-Watt hour
HAC	heliostat array controller
HMBP	Hazardous Materials Business Plan
HTF	heat transfer fluid
HCS	heliostat control software
HV	high voltage
IEEE	Institute of Electrical and Electronics Engineers
I/O	Input/Output
KNO_3	potassium nitrate
kV	kilovolt
lb	pound
LIDAR	light detection and ranging
LLC	Limited Liability Company
LORS	Laws, Ordinances, Regulations
LV	low voltage
m^2	square meters
MSDS	Material Safety Data Sheet
MW	megawatt
NAAQS	National Ambient Air Quality Standards
$NaNO_3$	sodium nitrate
NBC	Nevada Building Code
NDEP	Nevada Department of Environmental Protection
NDOW	Nevada Department of Wildlife
NDOT	Nevada Department of Transportation
NEPA	National Environmental Policy Act
NFPA	National Fire Protection Association
NHPA	National Historic Preservation Act
NNHP	Nevada Natural Heritage Program
NOI	Notice of Intent
NO_x	oxides of nitrogen
NPDES	National Pollution Discharge Elimination System
NRS	Nevada Revised Statutes

NV	Nevada
OHV	off-highway vehicle
OSHA	occupational Safety and Health Administration
Pb	Lead
PLC	programmable logic controllers
PM_{10}	Particulate Matter 10 micrometers or less
$PM_{2.5}$	Particulate Matter 2.5 micrometers or less
POI	Point of Interconnection
POD	Plan of Development
PPE	Personal Protective Equipment
PRMP	Proposed Resource Management Plan
psia	absolute pressure per square inch
PSD	Prevention of Significant Deterioration
PUCN	Public Utilities Commission Nevada
RMP	Resource Management Plan
ROW	right-of-way
RPS	Renewable Portfolio Standard
SARA	Superfund Amendments and Reauthorization Act
SCS	Soil Conservation Service
SCADA	supervisory control and data acquisition
scf	standard cubic feet
SDI	Sustainable Development Investments
sf	square foot
SHPO	State Historic Preservation Office
SO_2	Sulfur Dioxide
SPCC	Spill Prevention, Control and Countermeasures Plan
SPPC	Sierra Pacific Power Corporation
STG	steam turbine generator
SWPPP	Storm Water Pollution Prevention Plan
TES	thermal energy storage
UAT	unit auxiliary transformer
UEPA	Utility Environmental Protection Act (Nevada)
UPS	uninterruptible power supply
US	United States
USC	United States Code
USFWS	United States Fish and Wildlife Service
USRG	United States Renewables Group

UTC	United Technologies Corporation
V	Volt
VDC	volt direct current
VOC	Volatile Organic Compounds
VRM	Visual Resource Management
WMP	Waste Management Plan
%	Percentage
°	Degree

EXECUTIVE SUMMARY

This Plan of Development (POD) is submitted to the Bureau of Land Management (BLM) in support of an application for a Right-of-Way grant allowing a solar energy project to be constructed on land managed by the BLM. The proposed project will be a concentrated solar electric generating facility on a site located in an area northwest of Tonopah, Nevada within a portion of Nye County. The project will be capable of producing approximately 500 gigawatt-hours (GWh) of renewable energy annually, with a nominal net generating capacity of 100-180 megawatts (MW).

Tonopah Solar Energy's technology is a concentrating solar power (CSP) technology, utilizing a central receiver/tower and equipped with an integrated thermal storage system. The proprietary receiver and storage components are provided through an exclusive license with United Technologies Corporation subsidiary Hamilton Sundstrand Rocketdyne ("UTC" or "Rocketdyne").

Tonopah Solar Energy's technology generates power from sunlight by focusing energy from a field of sun tracking mirrors called heliostats onto a central receiver. Liquid salt, which has the viscosity and appearance similar to water when heated, is circulated through tubes in the receiver, collecting the energy gathered from the sun. The heated salt is then routed to an insulated storage tank where it can be stored with minimal energy losses. When electricity is to be generated, the hot salt is routed to a heat exchanger (or steam generator) and used to produce steam, which generates electricity in a conventional steam turbine cycle. After exiting the steam generator, the salt is sent to the cold salt thermal storage tank and the cycle is repeated. The salt storage technology was demonstrated successfully at the Solar Two facility in Barstow, CA in the late 1990's.

The benefits of this unique technology are as follows. First, salt in the liquid state has highly efficient heat transfer and storage properties. Because the salt is used as the heat transfer medium in the cycle, no natural gas is required for startup or to maintain steam cycle conditions during cloud cover, as with some solar technologies. Second, because the salt stores energy, the stored energy can be extracted upon demand to produce electricity even when there is no sunlight. Third, the storage capability provides flexibility to generate electricity in large quantities for short periods of time or in smaller quantities over longer periods of time, thereby matching the seasonal and varying electricity demands of the state.

The primary objective for the proposed project is to construct, operate and maintain an efficient, economic, reliable, safe and environmentally-sound, solar-powered generating facility. The site selected is located in an area within the state where excellent solar resources exist. In addition to a world-class resource, the Nevada solar market is being driven by the Renewable Portfolio Standard (RPS) adopted by the Nevada legislature. Under the standard, the state's investor-owned utilities must use eligible renewable energy resources to supply a minimum percentage of the total electricity they sell. The RPS requires Nevada's electric utilities to generate or acquire a minimum of 5 percent of electricity sold to retail customers from renewable energy systems in 2003 and 2004, and increases the standard by 2 percent biennially to 15 percent by 2013.

The solar facility will have the following features:

- A large field of heliostats or mirrors to reflect the sun's energy onto a central receiver or tower
- A conventional steam turbine to generate electricity

- Thermal storage tanks to store the hot and cold liquid salt
- A hybrid cooling system (i.e., an air cooled condenser with a wet cooling augmentation system designed to minimize water consumption by use only during times of high electricity demand)
- Associated equipment such as pumps, transformers, heat exchangers, and buildings
- Associated linear facilities including a transmission line and access road

The project offers the following key benefits:

- The proposed solar facility is expected to generate approximately 500,000 MWh per year and can displace the use of natural gas and associated carbon dioxide (CO_2 – a greenhouse gas) emissions produced by fossil-fueled power plants. The project will assist the State of Nevada in developing renewable sources of energy and displacing older conventional power generation.
- The project will minimize the use of water by utilizing an air cooled condenser with a small wet cooling augmentation system (hybrid cooling system) to enhance energy production and to be used only during times of high demand.
- The project can provide flexibility for state renewable power supplies by being able to generate a large quantity of electricity for a short period of time or a smaller quantity of electricity over a longer period of time without changing the size of the solar array.
- The project is expected to promote economic development by creating approximately 40-45 permanent jobs and up to 400-500 peak construction jobs

1. INTRODUCTION

Tonopah Solar Energy submitted an Application for Transportation and Utility Systems and Facilities on Federal Lands (Standard Form 299) to the BLM to secure a Right-of-Way (ROW) Grant on November 5, 2008 to permit, build, construct, and operate a 100-180 MW solar power generating facility based on concentrating solar power technology (CSP). This technology utilizes heliostats (reflecting mirrors) to redirect sunlight on a receiver erected in the center of a solar field. The solar power facility is proposed to be located on BLM property located in Nye County, NV (hereinafter, the Site).

Commercial operation of the facility is anticipated to commence in the summer of 2014 or earlier, if all required permits and authorizations have been secured. Tonopah Solar Energy anticipates filing an application for a permit to construct a utility facility in compliance with the Nevada Utility Environmental Protection Act (UEPA) with the Nevada Public Utilities Commission in the fall of 2009. Construction of the facility will take approximately 30 months to complete.

This Plan of Development (POD) is submitted by Tonopah Solar Energy, LLC in support of the application for a ROW in accordance with guidelines recently provided by the BLM. (Appendix A, BLM Cross Reference Table, contains the information requested by the BLM for the POD as well as a cross-reference table indicating the location in this document of the information requested by the BLM.) The primary objective of the POD is to supplement the Standard Form 299 by providing the following project-related information:

- Project Description, including the purpose and need for the project, general facility description and design, and permitting requirements;

- Project construction methods;
- Related Facilities and Systems, including transmission facilities;
- Operations and Maintenance; and
- Environmental Considerations, which describes the anticipated impacts and proposed mitigation to various resources.

This initial POD is not intended to be a final and complete document but rather a dynamic document that may be amended to include supplemental information, analysis, or studies as the project progresses. Additional supplemental information anticipated to be submitted to the BLM before the environmental review process is completed will include, among other things, more detailed engineering and civil design drawings, project alternatives, facility management plans, and facility decommissioning plans.

2. PURPOSE AND NEED

The project is designed to meet the increasing demand for clean, renewable electrical power. The United States has a greater solar energy resource potential than that of any other industrialized nation. The multiple benefits associated with developing this resource have been recognized by both Federal and state policy-makers. Development of solar resources reduces reliance on foreign sources of fuel, promotes national security, diversifies energy portfolios and contributes to the reduction of greenhouse gas emissions.

Nevada enacted a renewable portfolio standard (RPS) as part of its 1997 restructuring legislation. Under the standard, the state's investor-owned utilities must use eligible renewable energy resources to supply a minimum percentage of the total electricity they sell. The RPS requires Nevada's electric utilities to generate or acquire a minimum of 5 percent of electricity sold to retail customers from renewable energy systems in 2003 and 2004, and increases the standard by 2 percent biennially to 15 percent by 2013. Construction and operation of the project will contribute to achieving Nevada's RPS goals as well as providing jobs in the local economy.

In addition to its environmental attributes, the project will contribute much needed on-peak power to the electrical grid that serves the western United States. The demand for power continues to grow in these states. The thermal storage capability of this technology allows renewable electricity to be produced even when the peak demand period extends into the late evening hours. As older technology fossil-fuel plants reach the end of their useful lives there is a benefit in replacing them with clean, reliable energy sources. The project responds to this need.

The project is proposed on lands administered by the BLM for several reasons. According to the National Renewable Energy Laboratory United States Solar Atlas, the project area maintains high insolation levels on a year-round basis, creating ideal conditions for solar energy generation. While many undeveloped parcels of land exist in Nevada, it can be difficult to acquire parcels from private parties and assemble the acreage needed for a concentrating solar power plant. If enough private land were acquired, permitting issues at a local level within a jurisdiction with no policy on solar development can be difficult. The BLM's general solar policy is to facilitate environmentally responsible commercial development of solar energy projects on public lands and to use solar energy systems on BLM facilities where feasible (BLM Instruction Memorandum No. 2007-097). Given the BLM's solar policy and the advantage of the BLM

controlling large acres of land in the southwestern U.S., the applicant is proposing this project on BLM administered land as opposed to private lands.

3. APPLICANT FINANCIAL AND TECHNICAL CAPABILITY

SolarReserve, doing business as "Tonopah Solar Energy, LLC", is a Santa Monica, California based energy company formed by US Renewables Group, a private equity firm focused exclusively on renewable energy. SolarReserve now holds the exclusive worldwide license to build solar plants that use equipment manufactured by United Technology Corporation's subsidiary, Hamilton Sundstrand, through its Rocketdyne division. More than $100 million has been invested to date by Rocketdyne, the US Department of Energy and others in the design and manufacture of these components. Hamilton Sundstrand brings a broad base of experience in building the most reliable power systems in the world and supports a multitude of other programs to support the further development and implementation of the technology.

US Renewables Group (USRG) is one of the largest private equity firms focused exclusively on investing in renewable power, biofuels and clean technology infrastructure. USRG was founded in 2003 and has mobilized $575 million of capital commitments and has made 17 diversified investments across two funds. USRG has offices in Los Angeles and New York.

The SolarReserve team, both solely and in cooperation with other energy firms, is developing a portfolio of opportunities to deploy solar energy plants in the United States, Europe, Africa, the Middle East, Latin America and Australia. The SolarReserve management team has successfully developed more than $7 billion in electricity generation projects at previous companies. This includes solar and wind energy projects as well as natural gas, cogeneration, and biomass-fired electricity generating facilities located in the United States and more than a dozen countries around the world.

SolarReserve recently closed a second round of funding totaling $140 million. The additional funds will enable the company to advance its development of utility scale power plants in locations across the globe. The financing was led by the renewable energy private equity group within Citi Alternative Investments, Sustainable Development Investments (SDI), and Good Energies, one of the largest private investors in the solar industry. Other investors include US Renewables Group, the founding investor in SolarReserve, along with PCG Clean Energy & Technology Fund (CETF), Nimes Capital, LLC and Credit Suisse.

The estimated cost of the project is between $700 million and $800 million dollars and is generally broken down into the following cost areas:

- 30% Receiver, Tower, Salt Tanks & Heliostats
- 18% Steam Turbine Generator and Steam Generation
- 6% Cooling System and Water Treatment
- 7% Miscellaneous Process Equipment
- 9% Electrical and Instrumentation
- 2% Civil and Site Work
- 10% Structural

- 2% Buildings
- 11% Piping & Instrumentation
- 5% Mechanical Utilities.

Tonopah Solar Energy has already invested substantial resources for this project, including filing of an interconnection request and engaging qualified engineering and environmental consultants to support development efforts. Additional contributors to this POD are as follows:

- **WorleyParsons** —WorleyParsons has provided engineering support to a broad portfolio of clients in the utility-scale solar energy field, including utilities, major IPPs, and recently formed ventures. WorleyParsons' staff has extensive experience with all four types of concentrating solar technologies. Solar power staff has been involved in the design, construction, and operation of nineteen concentrating solar power facilities including the nine SEGS plants in Southern California, six dish/Stirling solar power systems, Solar I and II power tower systems and two compact linear reflecting Fresnel systems. Worley Parsons is currently completing solar plant engineering for FPL Energy and other project developers. Their world-class conventional power engineers have the capability to design and build the power block of solar power facilities rapidly and at a minimum cost. They also have experience with flat-plate and concentrating photovoltaic systems. Worley Parsons capabilities include solar resource assessment and site selection, plant design point and annual performance simulation, plant design and cost estimating, construction management, acceptance testing, and plant O&M. WorleyParsons will provide engineering services throughout the project's life from concept selection, plant configuration tailored to match utility load, preliminary engineering and detailed design. WorleyParsons commenced operations over 25 years ago and now employs 32,200 personnel in 118 office locations in over 38 countries and has an established track record of successfully executing major projects for its customers.

4. PROJECT DESCRIPTION

The proposed solar power project is based on concentrating solar power (CSP) technology. The proposed CSP technology utilizes heliostats/reflecting mirrors to redirect sunlight on a receiver erected in the center of the solar field (the power tower or central receiver). A heat transfer fluid (HTF) is heated as it passes through the receiver and then circulated through a series of heat exchangers to generate high-pressure superheated steam. The steam is then used to power a conventional Rankine cycle steam turbine/generator, which produces electricity. The exhaust steam from the turbine is condensed and returned via feedwater pumps to the heat exchangers where the high-pressure superheated steam is generated again.

Both the central receiver and type of heat transfer fluid used in the cycle distinguish Tonopah Solar Energy technology from other concentrating solar power technologies. With the Tonopah Solar Energy technology, salt, which is melted to a liquid form, is circulated through the tubes in the central receiver, collecting the energy gathered from the sun. The heated salt is then routed to an insulated storage tank (hot thermal storage tank) where the energy can be stored with minimal energy losses. When electricity is to be generated, the hot salt is routed to the heat exchanger (or steam generator) and used to produce steam at high temperature. The steam is then used to power a conventional steam turbine, generating electricity. After exiting the steam generator, the salt is sent to a "cold" salt thermal storage tank and the cycle is repeated.

The salt is a combination of sodium and potassium nitrate, with a melting temperature of approximately 460°F. In the liquid state, the salt has the viscosity and appearance similar to water. Salt is a heat storage medium that retains thermal energy very effectively over time. Once the salt is melted to a liquid form during construction, it will remain heated and in a liquid state throughout the plant's operating life, being reused again and again in the cycle. The salt utilized is a technical grade salt similar to commercial fertilizer.

A primary advantage of the central receiver technology using salt is that the heat transfer medium can be heated to temperatures over 1000°F. Steam can be generated at utility-standard temperatures, allowing the use of highly efficient steam turbine cycles.

Table 1
Solar Technology Comparison

Technology	Thermal Storage Capability – electricity production w/o sun	Steam Temp > 1000°F for greater efficiency	Disruption of power due to clouds/other
Tonopah Solar Energy	Yes	Yes	No
Photovoltaic	No	N/A	Yes
Trough	No *	No	Yes *

*Unless the plant is equipped with additional heat exchangers and a molten salt system

While Tonopah Solar Energy's technology is among the most efficient of solar technologies, one characteristic of the technology is a tall, central tower. The tall tower, described in further detail below, ensures that the large array of heliostats can focus the solar energy onto the receiver mounted on top of the tower.

Tonopah Solar Energy, in conjunction with Rocketdyne, has optimized the size of the solar array or heliostat field and tower height to achieve a technology which can operate at commercial scale and produce renewable energy at a competitive price. Thus, the tower height and size of the solar field are characteristics of the technology and will not vary based on plant output.

Additional information on the tower height and size of the solar array are provided below.

4.1 Project Location

The proposed project Site is located in south-central Nevada in Nye County. Located on lands administered by the Bureau of Land Management (BLM), the project encompasses approximately 7,680 acres (**Figure 1, Vicinity Map**): Township 4 North, Range 41 East, Sections 2, 3 and 10 – 15, and Township 5 North, Range 41 East, Sections 26, 27, 34, and 35. As illustrated on **Figure 2, Local Vicinity Map**, the nearest community to the Site is the town of Tonopah, NV, which is located to the southeast approximately 13 miles (from the Site, 8.5 miles south along Pole Line Road to Highway 95/6, and then 4.5 miles east along Highway 95/6 to Tonopah).

Figure 1, Vicinity Map

Figure 2, Local Vicinity Map

The land necessary for construction of the proposed solar power plant, including the heliostat array, power block, and associated facilities consists of approximately 1,600 acres located within the land boundaries described above and shown on **Figure 3, Project Site Plan.** The proposed boundaries as filed in the SF-299 application are currently in excess of the minimum needed to site the physical equipment. Because the project is at the preliminary project design stage, the additional land will allow the applicant the flexibility to adjust the location of the central tower based on the results of soils/geotechnical, cultural, and biological baseline studies and then determine an adequate buffer between plant facilities and any adjacent uses before finalizing the equipment location within the Right-of-Way (ROW) and finalizing the plant boundaries.

Tonopah Solar Energy performed preliminary screening on additional BLM land near Anaconda substation. Tonopah Solar Energy's technology has specific siting requirements including a large open space of approximately four square miles, minimal slope, transmission access, water availability, road access, and high solar incidence. Tonopah Solar Energy is also limited to sites not already claimed by other developers.

The site selection process for the proposed project involved screening sites based on the following parameters:

- Siting area with minimum area of four square miles and contiguous in configuration
- Solar resource
- Distance from transmission lines and substations
- Land ownership
- Water data
- Topography
- Wind data
- Airport locations
- Highways/roads
- Faults
- Population centers
- Military bases
- BLM SF-299 applications pending
- Various environmental constraints

Based on the above criteria and BLM land available, the proposed Site was identified as a preferred siting location in Nye County. The Site is situated on a relatively flat piece of BLM land covering approximately 7,680 acres. The annual average direct normal solar resource estimate surpasses 6.5 kWh/mi2/day. NV Energy's Anaconda substation is directly adjacent to the northeast of the Site. Additionally, the Site does not appear to be located in Areas of Critical Environmental Concern (ACECs) or areas of potential impact to military operations based on the DOD online screening tool. Other regional sites had the requisite minimum four square miles of contiguous BLM lands but were further away from transmission substations of interest compared to the proposed Site. The selected Site affords fewer impacts to BLM land as a result.

Figure 3, Project Site Plan

4.2 Generating Facility Description

The overall site layout for the proposed facility is shown on **Figure 3, Project Site Plan** and includes the following components:

- The solar array, a circular field with a radius of approximately 4,300 feet where the heliostats are located.
- The power block, a circle with a radius of about 400 feet which houses the central receiver tower, storage tanks, steam turbine, air cooled condenser, transformers, heat exchangers, power block buildings, and other ancillary equipment.
- An administration building, warehouse, and evaporation ponds, which will be located along the outside perimeter of the solar array.
- Associated linear facilities including transmission and access road. The project will interconnect to the Anaconda substation located approximately six miles due north of the generating facility location. The Site is closely located to the transmission network into which the project will supply electrical power. The outgoing transmission line will follow the site access road to Pole Line Road, head north along Pole Line Road to where the Millers to Anaconda transmission line is located, and then parallel the Millers to Anaconda transmission line to the Anaconda Substation, where it will interconnect with the electricity grid (the Point of Interconnection).

The Master Title Plat for the proposed facility is shown on **Figure 4, Master Title Plat.**

4.2.1 Solar Field

A solar power tower/central receiver system generates electric power from sunlight by focusing concentrated solar radiation on a tower-mounted receiver. The system uses thousands of sun-tracking mirrors called heliostats, which are arranged concentrically around the central receiver tower and reflect the incident sunlight onto the receiver.

The proposed facility will consist of up to approximately 17,350 heliostats occupying approximately 1,400 acres. Each heliostat will be approximately 670 square feet in size, yielding a total reflecting surface of about 12,000,000 ft^2 (1,100,000 m^2).

The arrangement of the heliostats within the array is optimized to maximize the amount of solar energy that can be collected by the field and arranged to avoid interference among heliostats as they track the sun during the day. The heliostats will be arranged in arcs around the solar receiver asymmetrically, as described below.

- The first row or line of heliostats has a radius of approximately 420 feet.
- The longest arc/line of heliostats, with a radius of approximately 5,100 feet, is in the northern section of the heliostat array. This is due to the greater collection efficiency of heliostats located north of the receiver tower for sites in the northern hemisphere of the world. With the sun predominantly in the southern sky, the cosine effect of incidence and reflection angles are less in the northern heliostats than in the southern ones. The converse – lower collection efficiency in the southern section – is also

Figure 4, Master Title Plat

true; therefore, the maximum southern arc radius is the shortest, 3,580 feet, and the southern heliostat field is the smallest.

- The eastern sector of the heliostat is more valuable than the western sector for energy collection because afternoon energy collection, during on-peak utility hours, is more valuable than morning energy collection, during part-peak or off-peak hours. The maximum eastern row arc radius may therefore be greater than the maximum western row arc radius.

4.2.2 Central Receiver/Tower

The tower is a concrete structure, approximately 538 feet high, which supports a cylindrical receiver, approximately 95 feet tall, mounted on the top of the tower. The receiver is composed of tube panels through which the liquid salt or HTF flows. Therefore, the top of the receiver will be at a height of approximately 633 feet. A maintenance crane will also be mounted on top of the receiver, which is expected to be 20 feet tall. Structures in excess of 200 feet require a filing with the FAA to obtain a determination of no hazard prior to construction. Application has been made and is currently underway.

4.2.3 Power Block

The power block will include a steam turbine generator, multiple feedwater heaters, steam superheaters, lubricating oil system, hydraulic control system, valving, and feedwater pumps. Steam is generated at a temperature and pressure of 1,030°F and 1685 psia before entering the high-pressure section of the turbine. Steam exiting the high-pressure section of the turbine is reheated to increase its temperature before entering the immediate-pressure section of the turbine. Exhaust steam from the turbine is directed to the cooling system. The turbine drives a generator, which delivers electrical power via a main step-up transformer in the on-site substation to the utility grid. Extraction steam from the steam turbine is used to preheat the feedwater and for deaerating the feedwater.

This high-efficiency turbine is designed for reliable operation under conditions of daily start up and shutdown over the life of the plant. The solar field and power generation equipment may be started each morning after sunrise and insolation build-up. The solar field will shut down in the evening as the sun sets though the integral thermal energy storage system will allow the steam turbine to continue operating if there is demand for electricity.

The primary components of the power block include (See **Figure 5, Power Block Layout**).

- Solar Steam Generator System – The steam generator is the core of the steam supply system for the power block. The steam generator system includes a pre-heater, evaporator, superheater, reheater, and steam drum. High pressure feedwater enters the steam generator from the preheaters and leaves as saturated steam that subsequently flows to the superheaters.
- Solar Preheater – The solar preheaters are of a shell and tube design. High pressure feedwater enters the preheaters from the low pressure feedwater heaters and leaves as high pressure feedwater.
- Evaporator – The evaporator receives heated, high pressure water from the preheater and evaporates the water into saturated steam. The evaporator is of a shell and tube design.

Figure 5, Power Block Layout

- Solar Superheaters/Reheaters – The saturated steam flows to a shell and tube superheater to reach the desired steam-turbine temperature and pressure-operating conditions. The reheater receives "cold" outlet steam from the high-pressure turbine stage and reheats the steam before being reintroduced into the intermediate-pressure stage of the turbine.
- Steam turbine – Once the pressurized steam has reached the optimum temperature in the superheater, it flows to the steam turbine, which extracts thermal energy from the steam.
- Feedwater heaters – The feedwater is heated to the required conditions using conventional turbine extraction steam in low pressure feedwater heaters.
- Deaerator – A direct contact steam deaerator will be included to eliminate dissolved oxygen in the condensate and steam.

4.2.4 Cooling System

Heat rejection in the facility utilizes a cooling system. Three cooling options were considered for the project. These include the following:

- Evaporative Cooling Tower: A mechanical draft, wet cooling tower where the heat is rejected via evaporation and convection and cooled water returns to the condenser.
- Air Cooled Condenser (ACC): An ACC uses mechanical draft (fans) to blow ambient air across a heat transfer surface which cools and condenses the steam
- A combination of the two above sometimes referred to as a "Hybrid" cooling system which minimizes water consumption but retains the ability to enhance performance during periods of peak electricity demand.

A hybrid cooling system will be employed at the site. The cooling system consists of a steam turbine, exhaust transfer duct exiting the steam turbine, air-cooled condenser, small evaporative cooler, condensate tank, and condensate pump. The system receives saturated turbine exhaust from the steam turbine, where it is piped through a transfer duct to a finned-tube air-cooled condenser. The air-cooled condenser blows ambient air across a heat transfer surface area, which cools and condenses steam. The finned tubes are usually arranged in the form of an A frame or delta over forced draft fans to reduce land area requirements. The evaporative cooling system will take the form of a small cooling tower to augment the heat rejection system of the air cooled condenser, or it will take the form of a Wet Surface to Air Condenser to augment the plant auxiliary cooling system. In the either case, the evaporative cooling system will only operate during periods of high temperatures. If a small cooling tower is employed, it will increase the electricity generated and cycle efficiency during periods of high temperatures. The condensed steam is gathered in a condensate tank and provided to the feedwater circuit through a condensate pump.

A typical air-cooled condenser can condense steam within 30°F to 50°F of the ambient dry-bulb temperature. Water consumption for the cycle is addressed in Section 4.6.2.

4.2.5 Thermal Storage System

The thermal storage system utilizes hot and cold liquid salt tanks to store solar heat energy for later steam generation as well as associated pumps and piping. Thermal storage provides the facility with several enhancements. The solar field is nominally sized to provide excess solar energy to the system during summer months, and such sizing intentionally results in collection of excess heat that cannot be utilized instantly by the power block. The thermal storage capability allows the excess heat to be stored until utilized for power generation. Thermal storage can also extend the generation day of Tonopah Solar Energy power plants. The heated salt can be stored in insulated tanks to provide a steam heating source after the sun sets, allowing the facility to more closely satisfy the load demands of the electricity grid system, which typically peak in the late afternoon and evening hours. The thermal storage system includes an auxiliary electric heat source to keep the salt in a molten state through protracted maintenance outages.

The thermal storage system contains two storage tanks – one "cold" tank storing liquid salt at 550°F and one "hot" tank storing liquid salt at 1,050°F. As the sun rises, cold liquid salt (or HTF) is pumped from the cold liquid salt tank through the tubes inside the receiver. After absorbing energy from the concentrated sunlight, the temperature of the HTF is increased to the design outlet temperature of 1,050°F. Part of the heated HTF is then pumped to a hot liquid salt tank for storage and part to a steam generating system that produces superheated steam for use in the conventional Rankine cycle turbine/generator system. After exiting the steam generator, the HTF is returned to the cold tank where it is stored and eventually reheated in the receiver. This arrangement allows for excess heat to be stored for power generation outside of the direct solar-heating period of the day. The system also includes piping, valves, pumps, expansion tanks, and heaters.

The HTF consists of sodium nitrate ($NaNO_3$) and potassium nitrate (KNO_3) in a "eutectic" mixture designed to remain liquid or molten over a wide temperature range. The HTF mixture has a melting point of 460°F and must be preheated and maintained above this minimum temperature in order to remain in liquid form.

4.3 Major Electrical Systems and Equipment

The bulk of the electric power produced by the facility will be transmitted to the electric grid under the control of Sierra Pacific Power Company. During operation, a small amount of electric power will be used to power station auxiliary loads such as pumps and fans, control systems, and general facility loads including lighting, heating, and air conditioning, heliostat movement and other uses. Additionally, electric power will be used for heat tracing which will provide energy to maintain the salt in fluid state during protracted maintenance outages. Some power would be converted from alternating current (AC) to direct current (DC), which would be used as backup power for control systems.

4.3.1 Electrical Components

Power will be generated by the steam turbine generator (STG) and stepped up through the generator step-up transformer to the utility high voltage system. The generator shall be connected to the step-up

transformer by isolated phase bus duct. A low-side generator breaker shall be provided between the generator and the generator step-up transformer (GSU).

4.3.2 Main Generator

The generator will be synchronized to the utility's transmission system using the generator breaker. The STG will be supplied with metering quality current and potential transformers and meters capable of supplying signals to the control system and performance monitoring systems.

4.3.3 Generator Step-up Transformers (GSUs)

A two winding, delta-wye GSU transformer will be designed according to the Institute of Electrical and Electronics Engineers Standards (IEEE) C57.12.00-2000 and supplied for the STG generator. The neutral point of each high voltage (HV) winding will be solidly grounded. The GSU transformer will have metal oxide surge arresters adjacent to the HV terminals.

Accessories will include a local visual enunciator, magnetic liquid-level gauge, pressure-relief device, sudden pressure relay, oil preservation device, valves for top and bottom filter press connections, drain/sampling valves, grounding pads, bushing-mounted current transformers, combustible gas detector, on-line dissolved gas/water monitor with 4-20 milliamp signal out to the controller, and hot spot winding temperature elements.

The GSU will include manual de-energized tap changers located in the HV windings with taps ranging from 5 percent above normal to 5 percent below normal in 2.5 percent increments. GSU transformer auxiliaries will be powered from two 480 V, three-phase, three wire sources for each transformer. Each power supply will be fed from separate sources and routed in separate conduits.

4.3.4 Unit Auxiliary Transformer (UAT)

A two-winding, delta-wye UAT transformer will be designed according to the IEEE Standards C57.12.00-2000 and supplied for 4,160 V service. The UAT will be rated to supply facility startup and maximum operating power requirements. A system calculation showing all connected equipment loads for the UAT transformer will be used to determine the requirements prior to procurement of the UAT. The neutral point of the UAT low voltage (LV) winding will be 1,000 amp (A) low-resistance grounded.

4.3.5 Electrical Building

A plant electrical building will house the 4,160 V switchgear, 4,160 V motor controllers, low voltage switchgear, low voltage motor control centers, control panels, power and lighting panels, uninterruptible power supply (UPS), DC station batteries, DC switchboard, and other miscellaneous equipment, steam turbine control equipment and the control I/O cabinets.

4.3.6 Medium Voltage Switchgear

The medium voltage switchgear will be single-ended, rated 4,160 V nominal, three-phase, three-wire with ratings not to exceed 3,000 A continuous and the calculated fault current duty. The medium voltage switchgear will receive power from the unit auxiliary transformer through non-segregated phase bus duct.

The medium voltage switchgear lineups will be located indoors, will use vacuum interrupters, and will be rated to continuously distribute the full auxiliary load. Each lineup will contain auxiliary power metering and voltage transformers, a main incoming breaker, and feeder breakers as necessary to distribute the load. All medium voltage breakers will be electrically operated from the control system and equipped with a stored energy mechanism. Breakers will be provided with remote racking mechanisms.

4.3.7 Emergency Power Battery Systems

The emergency power for the plant switchyard and other plant critical loads will be supplied by the 125 volt DC (VDC) station battery system.

4.3.8 Lighting Systems

The project's lighting system will provide operation and maintenance personnel with illumination for both normal and emergency conditions. Project lighting will be designed to minimize light pollution through the use of sensor lights and directional lighting in cases where this would not compromise safety or security. Although the project is in a remote area, lighting on the Site will be limited to areas required for safety and shall be shielded from public view to the extent possible. Outdoor lighting shall be photocell controlled through contacts that control the outdoor lighting. To help reduce the visual impact created by outdoor lighting, the following mitigation measures shall be adopted:

Lights shall be directed on site so that significant light or glare shall not be created. Highly directional, high-pressure sodium vapor fixtures shall be used.

Nighttime backscatter illumination shall be avoided by directional shielding of lights and providing on/off switch at the bottom taller equipment.

Switched systems shall be used to allow reduction of light in areas where work is not ongoing and where light is not needed for safety reasons. All light switches shall be clearly identified.

Lighting will not be provided for the solar field, but is expected to be provided in the following areas:

- Building interior equipment, office, control, maintenance, and warehouse
- Tower
- Building exterior entrances
- Outdoor equipment within the power block and tank area
- Power transformers
- Power block roadway
- Parking areas within the power block area
- Tank Area
- Entrance gate

- Water treatment area
- Air Cooled Condenser

4.3.9 Communication Systems

The major communication system on site would be the SCADA (Supervisory Control and Data Acquisition) system. The SCADA system is composed of industrial PLC (Programmable Logic Controllers) hardware and software, field instrumentation, meteorological stations, and communications devices designed for site monitoring, control and historical trending of the solar power plant.

All data collected from the field would be transmitted to the site Control Room via a fiber or copper communications infrastructure. The Control Room would also contain a router for the point of connection to a T1 line or equivalent as well as phone lines for communication to the outside.

During construction, communication systems may be either "hard wired" or satellite communication system (dish) will be used. For the plant operations, it is expected that a "hard" wire communication source will be designed and installed to support the project. The communication line hard wire routing will follow the existing transmission line near the plant, and the new transmission corridor along Pole Line Road. This line will be designed and installed in cooperation with the applicable communications provider.

4.4 Transmission System and Interconnection

4.4.1 Interconnection

The proposed project is considering interconnection to the existing Sierra Pacific Power Company Anaconda Substation (ROW 033242) that is located north of the Site. In this case, a new transmission line will be constructed between the Site and the substation. The proposed route for the outgoing transmission line will follow the site access road to Pole Line Road, head north along Pole Line Road to where the Millers to Anaconda transmission line is located, and then parallel the Millers to Anaconda transmission line to the Anaconda Substation, where it will interconnect with the electricity grid (the Point of Interconnection).

Therefore, for a majority of the distance between the Site and the Anaconda Substation, the new transmission line will parallel the existing transmission line (ROW 033242) that crosses the northwest corner of the Site, (see **Figure 3, Project Site Plan**). It is anticipated that an additional SF 299 will be required for the new transmission line. The applicant plans to submit this additional SF 299 as soon as possible to support this route.

The plant switchyard and the transmission line between the plant switchyard and electrical system interconnection will be engineered, procured and constructed as part of this project. The high voltage interconnect from the plant to the electric utility will be made via a SF6-insulated, high voltage breaker with a single-circuit, overhead line from the plant switchyard to the utility substation.

The anticipated pole configuration used for the new transmission line is a steel "mono" pole, and is shown on **Figure 6, Pole Elevation**.

The applicant is working closely with Sierra Pacific Power Corporation (SPPC) and Nevada Energy to determine the layout for the interconnection location (POI). At this time, it is not certain if the POI will be within the fence line of the existing Anaconda Substation, if the fence line will need to be increased in size to accommodate the POI, or if a separate switchyard will be required immediately south of the existing Anaconda Substation. A preliminary layout representing the location and components involved in the interconnection will be provided as soon as this is determined.

The applicant is in discussions with SPPC regarding construction and ownership of the new transmission line. At this time, it is expected that the new transmission line will be owned by the Applicant.

4.4.2. Potential Transmission Route

The transmission line route is shown in **Figure 7, Transmission Interconnection Route** for interconnection to the Sierra Pacific Power Company Anaconda Substation. The interconnection line will exit the power block and follow the access road to Pole Line Road. At this location it will parallel Pole Line Road to the point where the existing Millers to Anaconda transmission line is located. The line will then turn north east and follow the existing transmission line to the existing Anaconda Substation. A typical transmission line profile is illustrated on **Figure 8, Transmission Line Profile**. The applicant needs to coordinate with Sierra Pacific Power Company on the routing of the line as it enters Anaconda Substation and intends to file an additional right-of-way application within BLM controlled land once this route is confirmed and if the route extends beyond Sierra Pacific's existing right-of-way.

4.5 Civil/Structural Features

4.5.1 Access Roads

Access to the site will be provided from State Route 89 (Pole Line Road). Pole Line Road is a Nye County owned and maintained road, and is asphalt surfaced from its intersection with State Highway 6/95 to north of the Site location. The access road will be connected directly to Hwy 89 near the southwest corner of the Site (see **Figure 3, Project Site Plan**). The paved surface of this road will be a two lane road, constructed with adequate width for two directions of travel with a minimum of two foot shoulders on each side of the road. This paved road will be extended to provide access to the power block. All roads within the power block will be surfaced with asphalt. The entry gate location is identified on **Figure 9, Ancillary Uses** and will be located a short distance east of Poleline Road in order to eliminate a backup queue on Rout 89. Grading for this access road will include the removal of existing vegetation, filling of ruts and depressions, and widening to a width of 24 feet. The solar field perimeter road will be groomed and surfaced with approximately 4 to 5 inches of road base. This road will then be compacted with a heavy roller to provide all-weather access. In addition, this road will be sloped to allow natural runoff or drainage structures (e.g., culverts) will be installed as needed. The proposed minimum road width is 24 feet – see **Figure 10, Road Sections**.

Figure 6, Pole Elevation

Figure 7, Transmission Interconnection Route

Figure 8, Transmission Line Profile

Figure 9, Ancillary Uses

Figure 10, Road Sections

Additionally, unpaved roads will be constructed from the power block to the east and south edges of the solar field. The unpaved solar field perimeter road will be constructed around the solar field, and is proposed to be surfaced with rock. A typical section of this road is shown on **Figure 10, Road Sections**.

The site access road will be directly connected to SR 89 (a.k.a. Pole Line Road). This roadway is a Nye County maintained roadway that does not have an associated ROW. Discussions were held with Nye County to confirm that a ROW does not exist, and there is no NDOT involvement with this roadway. According to Nye County, this roadway is owned and maintained by the County, and the NDOT will not be involved with the access road construction. Also, Nye County indicated that they will prepare paperwork to obtain ROW for Pole Line Road during the process associated with this project, and that the desired ROW width will be eighty (80) feet in width. According to Nye County representatives, the existing paved surface of Pole Line Road is between 24 feet and 28 feet.

4.5.2 Buildings and Enclosures

The following buildings and enclosures are planned as part of the project:

- Steam Generator Area Building (approximately 30,000 sf). This structure is planned to be located between the HTF storage tanks within the power block. The purpose of the building is to provide structural support and protection for the equipment associated with the heat exchange process.
- Steam Turbine Area/Enclosure (not considered a building). This structure will house the steam turbine generator and associated equipment, and is located within the power block. The STG may be enclosed in a building for protection, or it may be located outdoors.
- Electrical Building (approximately 2,500 sf): This structure will be located within the power block area and will house the switchgear, motor control centers, battery power supply and other primary plant electrical components.
- Administration/Maintenance Building (approximately 10,000 sf): This building will serve as the center for support staff for the project during operations. This facility is planned to be located outside the heliostat field, near the access road.
- Heliostat assembly building (approximately 80,000 sf): This building will be used as a protected environment for the assembly/construction of heliostats during construction of the plant. This facility will be temporary, yet may be converted to other uses at the completion of the construction of the project.
- Permanent Warehouse (6,000 sf): This building will provide for permanent warehouse space for the facility and will be located near the Administrative/Maintenance Building.
- Control Room Building (6,000 sf): This building will be located within the power block and will provide the control room functions for the project. This building will be located west of the Steam turbine Area.
- Building Sanitation Facilities: The administration and maintenance building located on the perimeter of the heliostat field and the control building located within the power block will each be served by a permanent septic system (tank and leach field).

4.5.3 Material Storage

On site storage for spare field and power block components will be required for maintenance uses. In addition, onsite storage facilities for water pretreatment chemicals, cooling water treatment chemicals, and boiler water treatment chemicals will be necessary. The HTF material (salt) will be delivered to the project as dry, solid pellets. The material will be delivered in 1-ton "super sacks" which can be stored on site until melted for use in the plant process. The salt must be heated until fluid for use in the system, and will be stored within the lay down area of the site until it is heated, liquefied and sent to the storage tanks. Potentially polluting substances will be managed in accordance with all applicable laws, ordinances, regulations and standards to protect worker health, prevent leaks and spills, and protect storm water quality as discussed further in Sections 4.9 and 4.14.

Construction lay down and storage will occur throughout the permanently disturbed areas. The power block, and the heliostat field immediately adjacent to the power block will be used for lay down and storage of the power block components. Equipment will be stored within the power block, and include cranes, loaders, fork lifts, generators, boom trucks, water trucks, etc. The earthmoving equipment will be stored in a central location each night near the area where the work is being undertaken, or near the west side of the heliostat field, where all the equipment can be most easily fueled. All these locations are within the perimeter of the permanent project facilities. Additionally, a small temporary lay down, worker parking area, and trailer parking area will be used during construction of the facility and are shown in **Figure 9, Ancillary Uses**.

4.5.4 Storage Tanks

The following storage tanks will be located on site:

- Demineralized Water Storage Tank: One demineralized water storage tank will be constructed to store demineralized water for use as mirror wash water, steam cycle make up, and for use in the hybrid cooling system.
- Fire/Service Water Storage Tank: One fire water/service water tank will be constructed to store water for fire protection, service water needs, and for raw water storage prior to treatment.
- HTF Storage Tanks: Two tanks will be constructed to contain the HTF. One will house the hot HTF (1,050 F), and the other will house the cold HTF (550 F).
- A lube oil storage tank will be associated with the STG.
- Additional ancillary tanks will be on-site for a variety of liquids within the power block area.

4.5.5 Pipelines

Project operational water will be obtained from on-site wells; therefore, an off-site pipeline would not be required. The CSP technology proposed for the project will not require a natural gas source.

During construction of the project, there will be a high water demand for soil moisture conditioning and dust control. The source of construction water will be from on-site wells.

4.5.6 Site Drainage

The Site is located on a portion of the Smokey Valley that slopes to the west at approximately 2%. The storm water drainage system will be designed to allow the storm flow to follow its pre-exiting drainage paths. Currently storm flows drain from the San Antonio Mountains to the east and infiltrate across the nearly flat site on their way to Peavine Creek. At the Site location, the storm flows broaden out, and do not follow individual drainage courses. This allows increased infiltrations as the flows move to the west towards Peavine Creek. Near the east end of the facility two gentle drainage paths are visible in the topographic survey of the site. These will be maintained, and the flows will be allowed to fan out, as they currently do, across the heliostat field.

The grading plan within the heliostat field, discussed later, will be such that storm flows follow pre-existing paths. The majority of the project site, within the perimeter fence, will not be graded. The majority of the project site will be smoothed to allow truck access throughout heliostat field.

Preliminary storm drainage for the overall facility can be seen on the grading plan included as **Figure 11, Preliminary Grading & Drainage Design**. More details of the power block are shown in **Figure 12, Power Block Grading and Drainage**. Appendix C includes the Conceptual Drainage Study for the Tonopah Crescent Dunes site which includes hydrology calculations showing the anticipated total storm flows associated with the water shed up stream from the Site. Small ditches will be constructed along road ways, as necessary, to provide a path of travel for water, and to allow infiltration of rainfall.

Preliminary hydrology calculations were performed using TR-55 (SCS Method) and it is proposed that the storm water drainage system be designed using the Soil Conservation Service (SCS) method (TR-55) to determine the amount of rainfall during a specific rainfall event, and in accordance with the Nye County Storm Water Design requirements.

All surface water runoff during and after construction will be controlled in accordance with the requirements of the National Pollutant Discharge Elimination System (NPDES) Storm Water Runoff Permit and all other applicable laws, ordinances, regulations, and standards.

The power island will be graded such that all rainfall within the power island will be directed to the containment ponds adjacent to the on-Site salt tanks and allowed to infiltrate. Pipe culverts will be used, as required, where storm channels cross roads.

4.6 Water Demand and Sources

4.6.1 Water Sources

The proposed source of water will be groundwater, extracted through a series of wells. A minimum of two wells, one for primary and one for back-up, will be drilled at the power block area. Based on well data from the Nevada Division of Water Resources well log database and the United States Geological Survey National Water Information System, the depth to water in the vicinity of the POD area ranges from approximately 55 to 104 feet below ground surface (bgs) and well depths range from approximately 100

Figure 11, Preliminary Grading & Drainage Design

Figure 12, Power Block Grading and Drainage

to 200 feet bgs. Wells in the vicinity of the POD area were installed in unconsolidated alluvial materials. No wells were reported within the POD area.

The POD area is located within the southeastern portion of the Tonopah Flat sub area of the Big Smokey Valley groundwater basin, which is within the Central Hydrologic Region of Nevada. The Tonopah Flat sub area is a designated basin and the southern half of the POD area (Township 4N, Range 41 East, Sections 2, 3, and 10 through 15) is located in a preferred use area.

The Tonopah sub area reportedly has 12,000 acre-feet of annual recharge, 2,000 acre-feet of annual inflow, 6,000 acre-feet of annual evapotranspiration and 8,000 acre-feet of annual outflow (Buqo, 2004). The perennial yield (safe yield) is estimated at 6,000 acre-feet per year (Buqo, 2004). The total water rights demand through March 1999 was reportedly 26,724 acre-feet per year. However, this is the estimated committed water rights in the sub area and does not represent the actual groundwater withdrawal and consumption, which are significantly less (Buqo, 2004). The majority of the water rights are committed to irrigation, mining and milling.

There is very little data available on groundwater quality in the basin. 'The general quality of groundwater in Nye County is suitable to marginally suitable with total dissolved solids concentrations exceeding the state or federal general drinking water standards in portions of the Big Smokey Valley groundwater basin (Buqo, 2004).

Further investigation would be conducted to determine site specific groundwater conditions and to verify that a groundwater supply of adequate quantity and quality can be developed.

4.6.2 Water Demand

Water will be necessary for both the operation of the project as well as construction of the project. During construction of the facilities, water will be required for soil moisture conditioning during the earthmoving operations and for dust control. Based on the expected soil conditions (existing moisture content and the optimal moisture of the soil necessary to achieve proper compaction), it is estimated that a total of approximately 500 acre-feet (AF) of water will be needed the first year of construction, while the major earthwork is on-going, and 150 AF of water will be needed per year of construction after the initial earth moving operations are complete for ongoing dust control during construction and moisture conditioning of soils for ongoing backfilling operations.

Water needs of the operating plant include three primary uses:

- Steam Cycle makeup water – estimated at 100 AF per year.
- Mirror wash water – estimated at 70 AF per year
- Hybrid Cooling System Augmentation – estimated at 430 AF per year

Although the steam cycle is a "closed system", operational steam blow down requires the addition of makeup water throughout the operating time frame. The heliostat mirrors' reflectivity will decrease in efficiency, and therefore the ability to generate electricity will decrease as the mirrors collect dust and

other particles. A mirror wash program will be implemented that will wash the mirrors on a continual basis. This program may run up to 7 days/nights per week. During the hottest and driest times of the year, the cooling system will be operated in "hybrid" mode. The "hybrid" mode of operation includes heat rejection through the ACC as well as heat rejection through the small evaporative cooler. The hybrid mode of operation will increase the efficiency of the plant and allow for the production of additional electricity during these times when electricity is in highest demand.

The process, fire and potable water needs will be met by use of groundwater from new wells. The construction water demand will be met by use of groundwater from new wells. The location, number, depth and design of any new groundwater wells that would be used to supply the project will be determined based on a groundwater investigation and test well program; however, at least two wells would be used for redundancy.

For operational use, water will be pumped into a raw water storage tank. Raw water will be treated through a reverse osmosis water treatment facility and converted to demineralized water for use in the steam cycle, for mirror washing, and for use in the hybrid cooling system. The need for additional pre-treatment such as water softening or ion exchange, if any, will be determined based on analytical data obtained during the groundwater investigation.

See section 9.1.16 for discussion of water resources.

4.7 Site Investigations and Data Needs

The following site investigations and data needs may be undertaken and or required as part of the planning and permitting for the project and would be provided to BLM as supplemental submittals:

- Aerial (LIDAR) survey to support detailed civil grading and drainage design;
- Geotechnical investigation, including borings, test pits, soil sampling, and ground penetrating studies for foundation and earthwork design; See **Figure 3, Project Site Plan** for the proposed preliminary boring and test pit locations;
- Test well program and aquifer testing to evaluate potential on-site groundwater sources;
- Meteorological and Insolation Station with security fence for detailed solar field design and generation profile development; See **Figure 3, Project Site Plan** and
- Phase I Environmental Site Assessment (ESA) to investigate past and current land use for indications of the manufacture, generation, storage, use, and/or disposal of hazardous substances at the Site;
- Pile Test program – may be necessary to provide additional information about the soils and the lateral resistance of pile foundations.
- Biological and Cultural Assessments

4.8 Temporary Construction Facilities

The project construction contractor will mobilize and develop temporary construction facilities and laydown areas adjacent to the power block and outside the heliostat field (see **Figure 3, Project Site Plan**). Once a final design has been established, the contractor will prepare site maps showing the construction project in detail. Temporary construction facilities will include construction staging areas, employee parking areas, temporary shop buildings, office trailer complete with electrical, telephone, and internet service, temporary sanitary facilities, a temporary guard shack, and on-site dumpsters. Additionally, rock processing equipment and a portable batch plant will be mobilized for site development. A temporary concrete batch plant will be mobilized for use during project execution. The temporary batch plant will include cement storage, and a batching operation where the cement, water, and aggregate can be proportioned and mixed. This facility will be located in the temporary lay down area or in the heliostat field, just east of the temporary lay down area. The majority of these temporary facilities will be located within the construction logistics/lay down/parking areas and or within the heliostat field. Construction equipment will be staged near the location of active work. This will primarily be within the power block located near the center of the heliostat field. Additionally, temporary sanitary facilities will be located throughout the Site for use by construction personnel and will be sized and located in accordance with OSHA requirements. Several areas internal to the solar field will also be set up to temporarily store materials for the construction of the power block facilities, for the construction of the heliostats and for temporary storage and heat conditioning of solid HTF. The purpose of this is to locate material more closely to the point of installation.

Until a geotechnical investigation is completed, it is not known if aggregate meeting the project requirements will be available on site. In discussions with Nye County, it was learned that Nye County and the local community obtain aggregate from borrow sites located along Pole Line Road, near Peavine Creek. Therefore, aggregate needs for construction may be obtained from a local borrow area, rather than within the project excavation. The off site borrow area will require a new SF 299 application, and this potential borrow site is located northwest of the Site, very close to the existing borrow pits used by Nye County and the local community (see **Figure 13, Offsite Borrow Area**). If aggregate meeting project requirements is unavailable from the local borrow site (primarily high strength concrete), the aggregate will be trucked to the site.

All on-site construction operations can be completed within the limits of the SF 299 filed for this project, and the two additional SF 299 applications discussed above (one for transmission and one for gravel/aggregate). Therefore, contractors and subcontractors constructing the facility will not require additional land beyond those considered in this POD.

A temporary trailer park is planned near the contractor parking location. This facility will allow contractor employees to reside locally. The nearby community of Tonopah can support a certain number of construction employees, however, a lack of sizeable nearby communities will limit the number of construction employees that can commute from a nearby location.

A temporary 10,000 gallon above ground storage tank will be used to supply diesel during construction of the facility. This will be located in the temporary lay down area, and will be double walled, or located within a containment area per applicable regulations.

Figure 13, Offsite Borrow Area

The sanitary needs of the construction force within the heliostats and power block area will be met with the use of portable toilets. The temporary construction trailers will use a temporary septic system that will be abandoned upon completion of construction.

4.9 Erosion Control and Storm Water Drainage

4.9.1 Erosion Control

Construction and industrial operations at the site will be subject to the General Construction and General Industrial Storm Water National Pollution Discharge Elimination System (NPDES) permits, respectively. Compliance with these permits will require preparation and implementation of construction and operation Storm Water Pollution Prevention Plans (SWPPPs) that address the following requirements (among others):

- Identification of activities that may pollute storm water;
- Identification of Best Management Practices (BMPs) to control storm water pollution, including water erosion and wind erosion;
- BMP inspection, maintenance and repair;
- Training; and
- Site inspection and monitoring.

Erosion and sedimentation control BMP's will be designed and implemented to meet the requirements of the General Construction and General Industrial Storm Water NPDES permits as well as any requirements specified by the BLM. In addition, grading and earthwork will follow the general requirements of Nye County.

The area of soil disturbance for the project would be kept to a minimum to limit wind and water erosion and enhance successful site rehabilitation/restoration. The areas of soil disturbance would be limited to access roads, construction support areas, and the heliostat, power block and operational support facilities.

Soil stabilization measures would be used to prevent soil being detached by stormwater runoff or wind erosion. The Applicant would employ temporary and permanent BMPs to protect the soil surface by covering or binding soil particles or preventing the concentration of runoff. The project would incorporate erosion-control measures required by regulatory agency permits and contract documents as well as other measures selected by the engineer. Site-specific BMPs would be identified in the SWPPP, with final selection and design by the engineer, and associated figures to be included in the final active project SWPPP.

Project design features and or mitigation measures that will aide in the protection of soil resources could include at a minimum:

- Erosion and sedimentation control calculations performed to verify acceptable stormwater velocities, calculate BMP clean out frequencies and to size rip rap.

- Construction and final drainage designed to promote sheet flow, avoid un-necessary concentration of runoff, and control runoff velocity
- Stone filters and check dams strategically placed throughout the Site to provide areas for sediment deposition and to promote the sheet flow of stormwater prior to leaving the Site boundary. Where available, native materials (rock and gravel) would be used for the construction of the stone filter and check dams. A stone crusher may be provided on site to utilize local stone for the production of gravel.
- Diversion berms, culverts and water bars would be utilized to redirect stormwater.
- Diversion channels would be armored as required to prevent erosion and scouring.
- Flat detention/infiltration ponds and ditches would be used.
- Where possible, maintenance roads would be designed not to disrupt regional flow patterns.
- Silt fences would be utilized extensively during each phase of construction to minimize wind and water erosion. Silt fence locations have yet to be determined and would be provided on the 90% engineering drawings.
- In areas of temporary disturbance (e.g., transmission line alignment, temporary construction support areas), the surface would be recontoured to promote sheet flow and restore and match the original or surrounding drainage function. Native vegetation would be restored to promote healing of the landscape.
- Periodic maintenance conducted as required after major storm events and when the volume of material behind the check dams exceeds 50 percent of the original volume. Stone filters and check dams are not intended to alter drainage patterns but are intended to minimize soil erosion and promote sheet flow.
- Erosion and Sedimentation control BMP design would be in accordance with applicable government codes and standards.

4.9.2 Storm Water Drainage

The proposed facility is located within the Site on a portion of the plain that slopes at a grade of approximately 2%. The storm water drainage system will be designed to allow the storm flow to follow its pre-exiting drainage paths. Currently storm flows drain from the San Antonio Mountains to the east and infiltrate across the nearly flat site on their way to Peavine Creek. At the Site location, the storm flows broaden out, and do not follow individual drainage courses. This allows increased infiltrations as the flows move to the west towards Peavine Creek. Near the east end of the facility two gentle drainage paths are visible in the topographic survey of the site. These will be maintained, and the flows will be allowed to fan out, as they currently do, across the heliostat field.

The grading plan, discussed later, will be such that storm flows follow pre-existing paths. The majority of the project site, within the perimeter fence, will be very lightly graded to allow truck access throughout heliostat field.

The solar generating facility will be left in a "as-is" condition for the majority of the heliostat field vegetation will be cut and heliostats will be installed at the current grades, without any on-site grading. Therefore, the flows will generally follow the predevelopment flow patterns. A detention facility will be constructed on the west portion of the solar field to detain the release of on site flows to match pre

development conditions, to allow infiltration, and to provide a location for sediment control before the storm water is discharged from the site.

Concentration of flows will be minimized by the use of check dams, stone filters, armored areas, and diversion swales that keep water from concentrating in areas of steeper slope. The detention facility located in the west portion of the solar field will be constructed in order to slow the water, allow it to infiltrate, and to promote flow patterns into their existing drainage patterns.

The storm water drainage system will be designed using the Soil Conservation Service (SCS) method (TR-55) to determine the amount of rainfall during a specific rainfall event, and in accordance with requirements specified in the most current versions of the Nye County design requirements.

All surface water runoff during and after construction will be controlled in accordance with the requirements of the General Construction and General Industrial Storm Water NPDES Permit, the requirements of Nye County, and all other applicable laws, ordinances, regulations, and standards.

The power island will be graded such that all rainfall within the power island will be directed to the containment ponds adjacent to the on site salt tanks and allowed to infiltrate. Pipe culverts will be used, as desired, where storm channels cross roads.

4.10 Vegetation Treatment and Weed Management

The developed portions of the site will be cleared of vegetation, grubbed and graded level (approximately 1,600 acres). This is necessary for construction access, fire prevention and risk of damage to mirrors by vegetation when placed into stow position. The following additional vegetation management principles will be implemented.

- Soil disturbance in support of construction will increase the likelihood of noxious weed introductions. Regular weed monitoring and management during construction would be required. Ongoing maintenance activities within the solar field would also have the potential for ongoing introduction of weedy species through soil disturbance and equipment entrance. As a result, ongoing weed management will be required as discussed below.
- Where temporary access is needed to install facilities or site leveling is not required for drainage or access, no removal of existing vegetation or grading would occur. Rather, trucks and equipment would drive over and crush existing desert scrub vegetation without direct removal. Crushed vegetation is much more likely to show a rapid recovery than sites where vegetation is removed and reseeded, or where soils are more intensively disturbed.
- Revegetation with native species would be implemented to the extent feasible. Areas of temporary disturbance, such as pipeline routes, temporary construction roads and temporary construction support, staging and laydown areas will be recontoured and revegetated.

The Applicant will develop a Preliminary Weed Risk Assessment and Weed Management Plan (WMP) for the Site that describes the non-native, noxious or invasive weed species that occur or are likely to occur in the Site, and prescribes management actions that may be taken to monitor for and eradicate specified

species, including mechanical and chemical methods approved by BLM. The WMP will also describe applicable regulations for the use of herbicides on federally managed lands in Nevada, and provide the basis for proper management and use of herbicides at the Site. A pre-emergent herbicide will be applied in the spring, and spot foliar applications will be used throughout the year to maintain the area free of vegetation.

Typical operations and maintenance requirements for native landscapes are low once established. The WMP will include weeding, annual pruning, and soil monitoring if necessary. Weeding should occur frequently, typically weekly, during the initial growth period to ensure that invasive plants do not mature and set seed. Weeding activities would follow the approved WMP. Once the native plant species are established, weeding frequency would drop to less frequent intervals.

4.11 Fire Protection

The project will rely on both onsite fire protection systems and offsite fire protection services during both construction and operations. The fire protection system would be designed to protect personnel and limit property loss and plant downtime in the event of a fire. The primary source of fire protection water would be the Service / Fire Water Storage Tank.

A Fire Protection and Prevention Plan will be prepared for construction and operation of the facility. The plans will include measures relating to safeguarding human life, preventing personnel injury, preservation of property and minimizing downtime due to fire or explosion. Fire protection measures will include fire prevention methods to prevent the inception of fires. Of concern are adequate exits, fire-safe construction, reduction of ignition sources, control of fuel sources, and proper maintenance of fire water supply and sprinkler systems.

During construction, the permanent facility fire suppression system will be placed in service as early as practicable. Prior to installation of the facility's permanent fire suppression system, fire extinguishers and other portable fire fighting equipment will be available onsite. These fire extinguishers will be maintained for the full construction duration, in accordance with local and federal OSHA requirements. During construction, water trucks would be first in and last out of the site for fire control purposes. Installation of a construction water source will be one of the first activities in order to provide an on-site source for construction and prevention water.

Locations of portable fire extinguishers would include, but not necessarily be limited to, portable office spaces, hot work areas, flammable chemical storage areas, and mobile equipment (e.g., passenger vehicles and earthmoving equipment). Fire-fighting equipment would be located to allow for unobstructed access to the equipment and will be conspicuously marked. Portable fire fighting equipment would be routinely inspected per regulatory requirements and replaced immediately, if defective, or if in need of recharge.

The facilities operating fire protection water system will be supplied from a dedicated portion of the water storage tank located on the plant site. One electric and one diesel-fueled backup firewater pump, each with a capacity of approximately 3,000 gallons per minute, will deliver water to the fire protection water-piping network. A smaller electric motor-driven pump jockey pump will maintain pressure in the piping

network. If the jockey pump is unable to maintain a set operating pressure in the piping network, the diesel fire pump starts automatically.

A piping network will be configured in a loop so that a piping failure can be isolated with shutoff valves without interrupting the supply of water to a majority of the loop. The piping network will supply fire hydrants located at intervals throughout the power plant site, a sprinkler deluge system at each unit transformer, and sprinkler systems at the STG lube oil equipment. Sprinkler systems would also be installed in the Administration/Control/Warehouse/Maintenance Building and Fire Pump enclosure as required by National Fire Protection Association (NFPA) and local code requirements. Handheld fire extinguishers of the appropriate size and rating would be located in accordance with NFPA 10 throughout the facility.

The vegetation within the limits of the project (generally within the confines of the perimeter fence) will be removed. Vegetation removal will be one of the early project activities, and this vegetation free area will provide protection from offsite fires during both construction and operations. Off site fires would burn to just outside the perimeter fence and extinguish themselves due to lack of fuel. The perimeter fence will be constructed of galvanized posts, and galvanized chain link fence (non combustible material). The project will ensure that flammable material is not stored near the perimeter of the project, thus further reducing the risk from off site fires.

4.12 Site Security

Chain link security fencing will be installed around the site perimeter, switchyard and other areas requiring controlled access prior to beginning construction. Site perimeter fence will be 8 feet high and have an overall height of no more than 10 feet from the bottom of the fabric to the top barbed wire. The fence will have top rail, bottom tension wire, and three strands of barbed wire mounted on 45 degree extension arms. Posts will be set in concrete.

Controlled access gates will be located at the entrances to the facility. Site gates will be swing or rolling type access gates. Access through the main gate will require an electronic swipe card, preventing unaccompanied visitors from accessing the facility. All visitors will be logged in and out of the facility during normal business hours. Visitors and non-employees will be allowed entry only with approval from a staff member at the facility. Visitors will be issued visitor passes that are worn during their visit and returned at the main office when leaving.

Personnel will staff the facility 24 hours per day/seven days per week. Even when the solar power plant is not operating, personnel will be present as necessary for maintenance, to prepare the plant for startup, and/or for site security.

4.13 Hazardous Materials and Waste Management

There will be a variety of chemicals and hazardous substances stored and used during construction and operation of the project. The storage, handling, and use of all chemicals will be conducted in accordance with applicable laws, ordinances and regulations.

Table 2
Hazardous Waste Laws, Ordinances & Regulations (LORS)

LORS	Applicability
Federal:	
Comprehensive Environmental Response, Compensation and Liability Act (CERCLA or Superfund), 42 USC §9601 *et seq.*, 40 Code of Federal Regulations (CFR) Part 302, as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA)	Requires notification to various agencies when there is a release of hazardous substances from a facility.
Emergency Planning and Community Right to Know Act (EPCRA), 42 USC §11001 *et seq.* 40 CFR Parts 350, 355, and 370	Requires inventory reporting, planning and reporting for hazardous and acutely hazardous materials.
Occupational Safety and Health Standards, 29 USC Section 65129; 29 CFR 1910 *et seq.* and Safety and Health Regulations for Construction, 29 CFR 1926 *et seq.*	Specifies standards for hazardous materials storage, handling, and worker protection in emergencies.
Oil Pollution Prevention, 40 CFR 112	Requires the preparation of a Spill Prevention Control and Countermeasures (SPCC) Plan.
Chemical Facility Anti-Terrorism Standard, 6 CFR Part 27	Requires facilities that use or store certain hazardous materials to submit information to the Department of Homeland Security (DHS) so that a vulnerability assessment can be conducted to determine what security measures should be implemented.
State:	
Storm Water Pollution Prevention, General Permit NVR100000	Requires the preparation of a Storm Water Pollution Prevention Plan for construction and industrial activities.
Local:	
International Fire Code, Nye County Code Section 15.16.010	Adopts the International Fire Code, 2003 Edition, into Nye County regulations.
Industry Codes and Standards:	
American Society of Mechanical Engineers (ASME), American National Standards Institute (ANSI) and American Society of Testing Materials (ASTM)	Sets forth standards for power plant design, including mechanical systems, electrical, and piping.
Uniform Fire Code, Articles 79, 80, and others	Sets forth requirements for the storage and handling of hazardous materials.
National Fire Protection Agency (NFPA)	Establishes fire prevention standards and guidelines.

The following planning documents will specify procedures for the proper storage and management of these substances at the Site.

Health and Safety Requirements - To comply with regulations set forth by the Occupational Health and Safety Administration (OSHA) and the Nevada Division of Industrial Relations, health and safety programs will be established for construction and operations at the Site that will document potential hazards and requirements for establishing and maintaining a safe working environment during construction and operation. The programs will include identification of all hazardous substances and chemicals used at the site, including Material Safety Data Sheets (MSDS), a communication and training program, labeling, and identification of hazards and safe work practices. In addition, safety showers and eyewashes would be provided adjacent to, or in the vicinity of, chemical storage and use areas. Plant personnel would use approved personal protective equipment during chemical spill containment and cleanup activities. Personnel would be properly trained in the handling of these chemicals and instructed in the procedures to follow in case of a chemical spill or accidental release. Adequate supplies of absorbent material would be stored onsite for spill cleanup.

Construction and Operating Stormwater Pollution Prevention Plans (SWPPP) – The project will comply with the requirements of the National Pollutant Discharge Elimination System (NPDES) through preparation and implementation of a SWPPP and filing of a Notice of Intent (NOI) to comply with the General Construction and General Industrial Stormwater NPDES Permit. The plans will include procedures to be followed during construction to prevent erosion and sedimentation, non-stormwater discharges, and contact between stormwater and potentially polluting substances.

Hazardous Materials Business Plans (HMBP) – Hazardous Materials Business Plans will be filed with Nye County for the construction and operation of the facility. The plans will inventory the hazardous materials and waste properties, quantities, storage containers and locations, and contingency planning and emergency response procedures.

Spill Prevention Control and Countermeasure Plans (SPCC) - SPCC Plans will be prepared for construction and operation of the Site. The plans will include spill prevention and countermeasures procedures to be implemented including (but not limited to) a spill record (if applicable), analysis of potential spills, description of containment facilities, fill and overfill prevention facilities, spill response procedures, personnel training and spill prevention. In addition, all spills will be reported to the BLM Hazardous Materials Coordinator.

A table of the chemicals and hazardous substances anticipated to be used at the Site and their storage locations is provided in **Table 3**, below. This list identifies each chemical by type, intended use, hazardous characteristics and estimated quantity to be stored onsite.

Table 3

Potential Project Hazardous Materials

Material	Chemical Abstract Service Number (CAS No.)	Use	Hazardous Characteristics	Estimated Quantity On Site
Carbon Dioxide (gas)	124-38-9	Generator purging	Asphyxiant, compressed gas	25,000 scf
Carbon Dioxide (liquid)	124-38-9	Fire suppression	Asphyxiant, compressed liquid, cryogen	25,000 lb

Diesel Fuel (No. 2)	68476-34-6	Fuel for emergency generator, fire water pump, and diesel storage for vehicle use	Toxic, combustible	11,500 gal
Ferric Chloride Solution	7705-08-0	Possible use for water pretreatment	Toxic	3,000 gal
Hydrogen	1333-74-0	Generator cooling	Toxic, flammable, explosive	24,000 scf
Hydrated Lime	1305-62-0	Possible use for water pretreatment	Toxic, corrosive	2,000 cf
Lubricating Oil	Various	Mechanical equipment lubrication	Toxic, combustible	25,000 gal
Mineral Oil	Various	Transformer oil	Toxic, combustible	100,000 gal
Nitrogen	7727-37-9	Blanketing	Asphyxiant, compressed gas	400 lb
Sodium Carbonate	497-19-8	Water pretreatment	Toxic	2,000 cf
Sulfur Hexafluoride	TBD	Contained in switchgear devices	Toxic	200 lbs
Sodium Hydroxide (50 % by weight)	1310-73-2	Possibly water demineralizer media regeneration	Toxic, corrosive	3,000 gal
Sulfuric Acid (29 % by weight)	7664-93-9	Batteries	Toxic, corrosive	2,000 gal
Sulfuric Acid (93 % by weight)	7664-93-9	RO feed pH control, possibly water demineralizer media regeneration	Toxic, corrosive	5,000 gal

The solar facility will require the use of large amounts of nitrate salt ($NaNO_3$, MSDS 7631-99-4; and KNO_3, MSDS 7757-79-1 at the site. The salt will be melted once during construction of the project and used throughout the project life at temperatures between 550° F and 1050° F. To ensure worker safety, the hot and cold HTF tank areas will be designed such that any release would be contained in a basin. The Construction SWPPP will specify procedures to prevent contact between HTF and stormwater during processing of this material prior to plant startup. In addition, the processing area would be cleaned to assure residual HTF is removed from surface soil after processing.

Industrial wastewater would consist of a relatively small amount of blowdown from the steam system and reverse osmosis treatment return flow. This wastewater would be disposed in evaporation ponds at the Site. A Technical Document will be submitted to the Nevada Division of Environmental Protection to permit evaporation ponds for industrial wastewater disposal at the site. The Technical Document will

include waste characterization, impoundment design, leak collection and detection, construction and operating parameters for the ponds, and closure requirements.

Domestic wastewater will be treated and disposed at the site using a septic disposal system consisting of septic tanks and leach field permitted with the Nevada Division of Environmental Protection and Nye County. It is anticipated that separate septic and leach field systems would be constructed for each of the power blocks and administrative buildings. These would be designed in accordance with local and state regulations by a licensed engineer. A typical/proposed schematic of this is shown below in **Figure 14, Proposed Septic System.**

The project would produce maintenance and plant wastes typical of a power generation plant. These wastes will be managed in accordance with a Waste Management Plan. Wastes may include oily rags, broken and rusted metal and machine parts, defective or broken solar mirrors and electrical materials, empty containers, and other miscellaneous solid wastes including the typical refuse generated by workers. These materials would be collected by a local waste disposal company and disposed at a landfill permitted to receive these wastes. Waste collection and disposal would be in accordance with applicable regulatory requirements to minimize health and safety effects, prevent leaks and spills, and prevent potential contact with stormwater.

Several methods would be used to properly manage and dispose of hazardous wastes generated by the project. Waste lubricating oil would be recovered and recycled by a waste oil recycling contractor. Spent lubrication oil filters would be disposed of in a Class I landfill. Workers would be trained to handle hazardous wastes generated at the site.

Chemical cleaning wastes will consist of alkaline and acid cleaning solutions used during pre-operational chemical cleaning of heat exchangers after the units are put into service. These wastes, which can contain elevated metal concentrations, would be temporarily stored on site in portable tanks, and disposed of off-site by a chemical cleaning contractor in accordance with applicable regulatory requirements.

4.14 Health and Safety Program

A Health and Safety Program will be established for construction and operation at the Site. The Program will include the following components:

- Policies and Responsibilities;
- Emergency response and contingency planning;
- Hazard identification and job safety analysis;
- Hazard communication;
- Safe work practices;
- Personal protective equipment;
- Hazardous work permitting systems;

Figure 14, Proposed Septic System

- Special considerations for electrical safety, hazardous materials and wastes, fall protection, confined spaces and mobile equipment safety;
- Training requirements;
- Incident reporting and investigation; and
- Record keeping requirements.

The project would also develop and implement a Construction Safety Training Program that would be adapted to serve as an Operations Safety Training Program as the project transitions from construction into routine power generation facility operations. As mentioned above for the Health and Safety Program, the elements of the Safety Training Program will be essentially the same for operations as for construction, but specifics of the training would be adapted as needed to be suitable for the specific work activities associated with operations to the extent that the various activities differ between the two phases. Typical training courses and the employees who are required to receive the training are provided in **Table 4** below.

Table 4 – Training Program

Training Course	Target Employees
Injury and Illness Prevention Training	All employees.
Emergency Action Plan Training	All employees.
PPE Training	All employees.
Heavy Equipment Safety Training	Employees working on, near, or with heavy equipment.
Forklift Operation Training	Employees working with forklifts.
Excavation and Trenching Safety Training	Employees involved with trenching or excavation operations.
Fall Protection Training	All employees.
Scaffolding and Ladder Safety Training	Employees required to use or erect scaffolding and employees using ladders.
Hoist and Rigging Program	Employees and supervisors responsible for conducting hoists and rigging operations.
Crane Safety Training	Employees supervising, crane operators, and employees involved in crane operations.
Fire Protection and Prevention Training	All employees.
Confined Space Entry Program	All employees
Blood Borne Pathogens Training	First Responders
Hazard Communication Training	Employees working with or handling hazardous materials.
Electrical Safety Training	Employees performing work with electrical systems, equipment, or electrical extension cords. Additionally, employees working with lockout/tagout activities.
Hand and Portable Power Tool Safety Training	All employees.
Heat Stress and Cold Stress Safety Training	All employees.

Table 4 – Training Program

Training Course	Target Employees
Hearing Conservation Training	All employees.
Back Injury Prevention Training	All employees.
Safe Driving Training	All employees.
Pressure Vessel and Pipeline Safety Training	Employees supervising or working on pressurized vessel, pipes, or equipment.
Respiratory Protection Training	All employees required to wear respiratory protection equipment.
Hot Work Training	All employees working with welding, heating, or other equipment that generates ignition sources.

5. REQUIRED PERMITS AND AUTHORIZATIONS

All construction, operation, and maintenance activities associated with the proposed project would be conducted in compliance with all relevant federal, state, and local regulations and permit requirements.

Table 5 below, Preliminary List of Required Permits and Authorizations provides a summary of the permits and authorizations that the Applicant may be required to obtain prior to construction and operation of the facility.

Table 5
Potential Project Required Approvals and Permits

FEDERAL PRELIMINARY LIST OF KEY APPROVALS AND PERMITS				
Regulatory Agency Level	Agency	Permit Potentially Required	Regulatory Requirement	Comment or Application Type
FEDERAL	BLM	Application for transportation and Utility Systems and Facilities on Federal Lands (SF 299) (Right-of-Way Authorization Permit)	This Right-of-Way Authorization permit serves all commercial solar energy facilities per BLM Instruction Memorandum No. 2007-097, April 4, 2007 (BLM Solar Energy Development Policy).	This application starts the process to gain right-of-way on BLM land; same as the BLM's previous Conditional Land Use Permit.
FEDERAL	BLM	Environmental Assessment (EA) or Environmental Impact Statement (EIS)	An evaluation of the Project's effects on natural and human resources to determine the potential for significant impacts.	Preparation of an EIS is required if significant impacts can not be mitigated.
FEDERAL	BLM	Plan of Development (POD)	Plan for construction and operation of solar facility must be completed prior to beginning of the NEPA process. POD provides full Project description including applicant information, site location, maps, and proposed operating plan.	

FEDERAL	BLM	National Historic Preservation Act (NHPA) Section 110; EO11593	Archaeological contractor needs to complete Class I inventory (e.g., file search for sites within area of potential effect (APE)). Contractor needs to complete 100 percent Class III survey of APE. If any historic structures are present, additional documentation could be needed.	
FEDERAL	BLM to contact Nevada SHPO and Tribal Historic Preservation Office	NHPA, Section 106 Review (36 CFR 800)	Information for Section 106 compliance would be based partly on findings of a Class III archaeological survey. Contractor would prepare draft letters.	The Nevada SHPO, Office of Historic Preservation, Department of Parks and Recreation and appropriate Tribal Historic Preservation Officers must be consulted when Projects are subject to review under Section 106 of the NHPA. This act requires that all federal agencies take into account the affect of their actions on historic properties (properties on or eligible for the National Register of Historic Places). Requirements of Section 106 review apply to federal undertaking, funding, license, or permit. The Advisory Council on Historic Preservation (ACHP) must be provided an opportunity to comment.
FEDERAL	BLM, State Office	BLM Cultural Resource Use Permit	Permit to be obtained by archaeological contractor; application includes outline of proposed work; name of institution and Project principal investigator; dates of field work; type of investigations; description of sites(s) with specific location information; and copy of agreement with institution where collections would be preserved.	Archaeological contractor to obtain Cultural Resource Use Permit from BLM prior to beginning work.
FEDERAL	BLM, Tonopah Field Office	BLM Field Use Authorization	Holder of Cultural Resource Use Permit obtains a Field Use Authorization for the Project from BLM field office.	Contact appropriate Field Office Archaeologist. Field Authorization Form requests specific information on the location, schedule and nature of the archaeological fieldwork and allows BLM to communicate specific constraints on a Project type, schedule or location.
FEDERAL	BLM	Archaeological Resources Protection Act (ARPA) of 1979, as amended Section 4	Holder of Cultural Resource Use Permit provides a research design and plan of work for the research Project to obtain an ARPA permit.	This permit would be needed if subsurface investigations are needed to identify the National Register of Historic Places significance of an identified site.

FEDERAL	U.S. DOD	DOD R-2508 Complex Sustainability Office Review and Approval	Review the Project and its potential impact on military overflights and operations	A letter from the DOD, stating that construction and operation of the array would not adversely affect DOD operations will be sufficient to meet this requirement; such a letter would be included in the EIS and submitted to the applicable County Planning agency.
FEDERAL	USFWS	Endangered Species Act (ESA) Section 7 Consultation	Informal consultation with the USFWS will determine if listed species are present on the Project site. A BA will be prepared as part of the information consultation. If listed species are present, formal consultation with the USFWS and preparation of a BA requires site surveys by qualified and certified wildlife biologists.	BLM will initiate informal consultation with USFWS
FEDERAL	USACE	Clean Water Act, Section 404 Permit	Placement of dredged or fill materials in waters and/or wetlands, as well as the performance of any work in navigable waters of the United States, requires a USACE permit. Need to delineate all wetlands and waters of the U.S. with the potential to be affected by the Project; quantify potential impacts and propose mitigation to offset impacts.	
FEDERAL	FAA	Federal Aviation Regulation Part 139 Sec. 139.331	Any airport under FAA certification must ensure that each classifiable obstruction is removed, marked, or lighted in accordance to FAA rules.	An object would be classified as an obstruction to air navigation if it is: (1) a height of 500 feet above ground level at the site of the object; (2) a height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within 3 nautical miles of the established reference point of an airport, etc.
State or Local	NDEP Bureau of Air Pollution Control or local county Health Department, depending on project location.	Air Permit - PSD Permit (Authority to Construct).		
State	PUCN	UEPA to construct with PUCN.	NRS 704.820 – 704.900.	
State or Local, depending on location	NDEP Bureau of Air Pollution Control or Local county Health Department	Construction Permit - State/Local Permit to Construct /Operate. Same as the Authority to Construct (ATC) permit.		The Air Permit is the same as the ATC permit and the Construction Permit.

State or Local, depending on location	NDEP or local county Health Department	Solid Waste Disposal Facility Permit-operations		This permit is only necessary if disposing on-site.
State	NDEP	Dust Control Plan-Power Plant Site	NDEP, NRS 321.001.	
State	NDEP	Dust Control Plan-Laydown area and Parking	NDEP, NRS 321.001.	
State	Nevada Division of Transportation (DOT)	Occupancy Permit		Occupancy Certificate is issued after final inspection, once all occupied buildings are completed
State		Permit to Open State Highway		Included in Grading Permit
State		Temporary Power Permit		Requires Nevada State Licensed Electrical contractor to sign off on grounding.
State	NDEP Bureau of Air Pollution Control	CEMS Certification Plans		Continuous Environmental Monitoring Systems.
State	NDEP Bureau of Water Pollution Control	SPCC - Construction		
State	NDEP Bureau of Water Pollution Control	SPCC - Operations		
State	State of Nevada Fire Marshall	Health Permit for Hazardous Materials		This permit needs to be filed within the first 30 days of operation.
State		AST Permit/Notification (For Petroleum Storage)		
State	NDEP Bureau of Water Pollution Control	SWPPP		This permit is the SWPPP.
State	NDEP Bureau of Water Pollution Control	SWPPP for Operations		Provide a NOI for filing after stormwater discharge pond design has been developed. NOI and SWPP must be filed simultaneously within one month of the start of operation.
State	NDEP Bureau of Water Pollution Control	Soil Erosion and Sediment Control Plan - Operations		Part of SWPPP
State	NDEP Bureau of Water Pollution Control	Storm Water Detention Plan - Operations		Part of SWPPP

State	NDEP Bureau of Water Pollution Control	Groundwater Discharge Permit		
State	NDEP Bureau of Water Pollution Control	AST Permit/Notification (For Petroleum Storage)		
State	Nevada Division of Wildlife	Artificial Pond Permit		
State	NDEP Bureau of Water Pollution Control	On-site Sanitary Disposal System (Septic System) Permit		
State	NDEP Bureau of Water Pollution Control	Ground Water Well Approval (Point of Diversion Permit (Permanent))		
State	NDEP Bureau of Water Pollution Control	Ground Water Well Approval (Point of Diversion Permit (Temporary))		

Because the Applicant would need to obtain a Right of Way (ROW) from the Bureau of Land Management (BLM), this project would be subject to BLM jurisdiction. Under federal law, BLM is responsible for processing requests for rights-of-way to authorize projects (such as the one described herein) and associated transmission lines and other appurtenant facilities to be constructed and operated on land it manages. In processing the applications, BLM must comply with the requirements of the National Environmental Policy Act (NEPA), which requires that federal agencies reviewing projects under their jurisdiction consider the environmental impacts associated with their construction and operation. In the case of solar thermal power plant projects, this would be accomplished through preparation of Draft and Final Environmental Impact Statements (EIS).

Separate consultation requirements and associated documentation are required for Section 106 of the National Historic Preservation Act and Endangered Species Act (ESA) section 7 consultations associated with the project, should they be required. These consultations would be completed by BLM. BLM is also responsible for Native American consultation, including Government to Government consultation. The result of this cooperative effort is intended to result in a public participation process and environmental document that fully meets BLM's requirements.

Table 6 below summarizes the estimated project development schedule. Section 6.1 includes a timetable indicating the anticipated duration and sequence of construction.

Table 6
Project Development Schedule

Phase	Duration
Prepare, review and approve Plan of Development	3 months
Field studies and resource reports in support of the Environmental Assessment (EA) or Environmental Impact Study (EIS)	8 months
EA/EIS Process	16-18 months
BLM File ROD	1-2 months
BLM issues ROW	1 month
Construction	30 months

6. CONSTRUCTION

6.1 Construction Process and Conceptual Schedule

Construction of the generating facility, from site preparation and grading to commercial operation, would be expected to take about 30 months. It would take about 100 man-years of construction workers' time to build the plant. The man loading will follow a bell shaped curve over the 30 months of construction and will peak at approximately 400 to 500 personnel of construction craft people, supervisory, support, and construction management personnel onsite during construction.

Typically, construction would be scheduled to occur between 5AM and 7PM on weekdays and Saturdays. Additional hours may be necessary to make up schedule deficiencies, or to complete critical construction activities (e.g. pouring of concrete at night during hot weather, working around time-critical shutdowns and constraints). During some construction periods and during the startup phase of the project, some activities would continue 24 hours per day, seven days per week. The items of work that may occur 24 hours per day include, but are not limited to placing and finishing concrete (due to cooler nighttime temperatures), welding on critical pipe systems (these may be critical path items and need expediting), radiation testing of the welds on certain pipes (completed when staff is vacated from the area), electrical terminations, DCS wiring and programming, heliostat assembly (if this seems to be falling off schedule), and preparation for start up testing. Because this is a solar plant, testing of the facility requires adequate energy supply (i.e. the sun). Therefore, preparations may take pace overnight to ready the facility for start up tests the following day, when sun will provide the energy to power the start up testing.

Table 7 below represents a conceptual project schedule beginning with site mobilization. The activities listed below are representative of Tonopah Solar Energy projects

Table 7
Project Schedule

Activity	Date/Timeframe
SITE CONSTRUCTION	
Start Construction	Month 1
Mobilization	Month 1
Delineate and mark the boundaries of the construction zone	Month 1
Stabilize construction entrance/exit and roadway. Install tire wash	Month 1
Establish parking and staging areas for vehicle and equipment storage, maintenance	Month 1
Establish laydown area(s) for materials storage/staging	Month 1
Establish concrete washout area	Month 1
Clear and Grub - Strip topsoil	Months 1-2
Install certified weed-free fiber rolls or silt fence at the base of slopes adjacent to delineated sensitive areas (i.e., wetlands), if any	Months 1-2
Construct stormwater infiltration/evaporation area	Month 3-6
Assemble and erect heliostats	Month 10-20
Power block construction	Month 6-24
Construct reinforced concrete foundations	Month 6-24
Construct administration/warehouse building	Month 20-22
Final stabilization of site	Month 27
Commissioning and testing	Months 27-30

6.2 Project Phasing

The construction phases for each of the proposed projects are expected to be as follows:

Site Disturbance – Within the heliostat array fields, the power block area, the permanent facilities located around the perimeter road and in the temporary construction logistics area, clearing would be performed. All vegetation would be removed with a brush rake in order to separate the vegetation from the soil.

Preparation – Parking areas for construction workers and laydown areas for construction materials would be prepared. Detailed information regarding the location of the construction parking is shown on **Figure 9, Ancillary Uses**.

Access Road – Primary access to the site would be from State Route 89 (Highway 89) along the access road and to the site. Access road beds would typically be 24-foot-wide asphalt roads with 2-foot-wide

crushed rock shoulders. A stabilized entrance/exit would be provided to clean vehicle wheels prior to exiting the construction area. Most construction staff and workers would come daily to the jobsite from Tonopah, located south east of the project location.

Site Grading – The existing site has a slope of approximately 2%. Where required, grading will take place to generally maintain the minor slopes of the terrain. The majority of the site is suitable at its current grade, and only the vegetation will be cut to provide a surface adequate for installing the heliostats. Where light grading is required, only nominal cuts and fills (generally less than 6") will be made to smooth out the heliostat field to create a drivable surface and for heliostat installation and maintenance. Nominal grading of the site would be limited to the power block areas, receiving towers, the access road, and any associated roadside ditches. The proposed grading plan for the power block is shown in **Figure 12, Power Block Grading & Drainage**. On this more detailed drawing, it can be seen that the more significant cuts and fills are limited to the power block. Excess sand, gravel and soils are not anticipated.

Foundation – All underground piping and wiring would be installed, followed by installation of the foundation for the new power blocks, solar towers, and associated structures.

Plant Construction – After final site design and prior to any soil disturbance, the Applicant would be required to finalize the Drainage, Erosion, and Sediment Control Plan / Construction SWPPP (DESCP / SWPPP). During construction, the Applicant would be required to follow the DESCP/SWPPP to prevent the offsite migration of sediment and other pollutants and to reduce the effects of runoff from the construction site. Best Management Practices (BMPs) to be used at the site would be fully addressed in the DESCP/SWPPP; the DESCP/SWPPP would include the location of BMPs to be used, installation instructions, and maintenance schedules for each BMP.

Site Stabilization – It is expected that site stabilization will include soil binders, geo-grid or the use of aggregate surfacing to allow the movement of maintenance vehicles and mirror wash water trucks to travel within the solar array. The predominant surface soil is expected to be relatively well graded soil, sand, and gravel, very similar to the existing surface conditions that currently exist on the site. The power block area would be graded with moderate slopes to direct runoff into the salt containment basin. This will allow the storm water to infiltrate locally. The western area of the site will contain the detention pond that will provide an area to allow sediment to be deposited and on site storm water to be controlled.

Demobilization – All temporary construction facilities would be removed and recontoured and revegetated as necessary. The project construction team or contractor would mobilize and develop temporary construction facilities and laydown areas adjacent to the power block. Once a final design has been established, the contractor would prepare site maps showing the construction project in detail. Temporary facilities would include:

- Approximately 10 single-wide full-length trailer offices or equivalent
- Chemical toilets
- Parking for approximately 500 vehicles
- Approximately 15 tool sheds/containers
- Equipment parking for approximately 20 pieces of construction equipment

- Construction material laydown area
- Solar field equipment laydown area
- Batch plant
- Rock processing equipment
- Construction Access and Material/Equipment Delivery

These items are more accurately shown in the figures provided with this POD update.

6.3 Construction Work Force and Equipment

The construction workforce will consist of a total of approximately 400 to 500 personnel at peak for construction, including supervisors and management personnel, with an average of approximately 250 crewmembers on site at any given time. Project construction will also require additional support staff, including construction inspectors, surveyors, project managers, and environmental inspectors.

Prior to commencing construction, crews will mobilize to the Site. During this time, equipment and construction materials will be transported to the designated construction staging areas, and trailers and temporary shop buildings will be established. In addition, personnel will receive appropriate safety and environmental training. Signage may also be erected at this time to designate approved access, fueling, smoking, concrete washout, and exclusion areas. **Table 8** outlines the construction process.

Table 8 – Construction Process

Construction Phase	Description	Approximate Number and Type of Construction Equipment and Vehicles
Rough Grading	Grubbing, clearing and bulk grading, including approximately 500,000 cubic yard of cut and compacted fill	Approximately 5 Scrapers, 2 Compactors, 3 Graders, 2 Loaders, 4 Dozers, 5 Water Trucks, 3 Water Pulls
Finish Grading	Final grading to finish grade at a rate of approximately 960,000 sf/day (22 acres).	Approximately 2 Scrapers, 3 Graders, 1 Dozer, 4 Water Trucks
Roads, Foundations, Flatwork and Site Utilities	Construction of roads, excavation and construction of foundations for	Approximately 20 to 40 pieces of equipment will be present at any one time, including concrete trucks, concrete pumps, backhoes, excavators, loaders, graders, foundation drills, paving machines, drum rollers, fork lifts, tractors, dump trucks, small cranes and additional support vehicles.
Heliostat Assembly and Deployment	Field assembly of heliostats in temporary shop buildings constructed at the site. Installation of assemblies on cast-in-place piers, or other foundations.	Approximately 8 to 10 crews, each with one or two pieces of equipment including small cranes, forklifts, welding machines, trucks and tractors.
Power Block	Construction of foundations,	An average of 12 to 18 pieces of equipment will

Construction	structural frames and buildings, installation of utilities and equipment, including the STG, condenser, pumps, buildings, ACC cooling structure, TES tanks, and central receiver tower.	be utilized for power block construction over the duration of the project, with more equipment being utilized during the early stages of foundation construction and frame erection. Equipment will include backhoes, excavators, foundation drills, concrete trucks, concrete pumps, forklifts, boom trucks, lifts, cranes, welders, trucks and other support vehicles.
Liquid Salt Preparation	Melting of the delivered dry salt product	Temporary propane, electric, or natural gas fired auxiliary boiler, forklifts, loaders, and trucks.

6.4 Site Preparation

Although the site currently contains very little vegetation (refer to **Figure 15, Grading Aerial** and **Figure 16, Site Photos**), site preparation will include the removal of vegetation within all areas to be disturbed. Removal of plant material will be done with heavy equipment and may include the use of a bull dozer equipped with a brush rake. Waste vegetation will be chipped and incorporated into the topsoil, chipped and spread on disturbed areas that are not part of the permanent project, or burned. Any topsoil encountered that is not suitable for structural fill will be stockpiled temporarily and re-used in the disturbed areas outside the permanent project facilities (for example the construction lay down and parking area). A temporary fence will be installed around the construction lay down and parking area and the permanent plant fence facility will be installed as soon as doing so will not disrupt construction of the project.

6.5 Clearing, Grading, and Excavation

Excavation will require the removal of all vegetation from the areas to either be excavated (cut) or filled. Grading activities will be completed with traditional earthmoving equipment including but not limited to bull dozers, scrapers, motor graders, excavators, water trucks, water wagons, loaders, and compactors. The majority of the efforts to grade the site will be completed within the first year of construction activities. Early grading will be completed in the area of the roads (to provide access), the laydown area (to provide an early location for storage), and in the power block (to provide an early start to the power block construction activities). Completion of the earthwork within the solar field will follow immediately after or during the early grading activities in order to allow construction of the solar field heliostats.

Minor grading will be ongoing in the form of excavation and backfill for foundations, pipelines, conduits and other miscellaneous facilities for the duration of construction.

6.6 Solar Array Assembly and Construction

The heliostat assemblies will be mounted on steel or concrete foundations. The geotechnical information and the potential pile test program will provide the information necessary to determine the most cost effective foundation. The most likely foundation will be a reinforced concrete pier foundation that is cast in a drilled hole. Alternate foundations could be concrete or steel piles.

The heliostats consist of glass mirror modules, structural support components, motor drives, a heliostat controller and a foundation. There are a total of approximately 17,350 heliostats each with a mirror

Figure 15, Grading Aerial

Figure 16, Site Photos

surface area of approximately 670 ft^2 (62.4m^2). The total mirror surface area for the plant is approximately 12,000,000 sf^2 (1,081,200m^2). The support structure consists of a steel frame backing to support the mirror modules and a steel tubular post for supporting the heliostat in the ground. Finally, the heliostat assemblies will be mounted on steel or concrete foundations. The geotechnical information and the potential pile test program will provide the information necessary to determine the most cost effective foundation. The most likely foundation will be a reinforced concrete pier foundation that is cast in a drilled hole. Alternate foundations could be traditional concrete mat foundations, concrete piles, or steel piles.

The Heliostat Array Controller (HAC) includes all hardware and software to control the Collector Field and consists of the Heliostat Control Software (HCS) and Beam Characterization System (BCS). The HCS actively controls the pointing of each heliostat to ensure that the hellostats image is properly positioned to ensure proper flux on the receiver. The actual pointing varies by the time of year and day, ambient temperature and mode of operation. Modes of operation include start-up, normal operation, shut-down and a number of off-nominal conditions (e.g., loss of heliostat power). The BCS automatically calibrates each individual heliostat using a BCS target located on the tower. There are sixteen (16) BCS targets on the tower and heliostat calibration is integrated into normal plant operations on a daily basis. Control/power wire for the HCS will be installed underground throughout the solar field.

6.7 Power Block Construction

The first phase of power block construction would consist of foundation work and underground mechanical work. Foundation construction would involve excavation, form, and rebar work preceding a number of concrete pours. The specific equipment in-use is more variable as the individual foundations and components are erected. The central receiver tower will be constructed of reinforced concrete using a slip-form process. Underground pipe work would require trenching, onsite welding, backfill, and compaction. When the foundations have cured adequately, major equipment and aboveground piping can be installed. During this phase of construction the steam turbine generator (STG), water treatment system, air-cooled condenser, generator step-up transformer, auxiliary transformers, and other ancillary equipment would be set on their corresponding foundations. Major equipment components would be installed and pump, turbine, and fan alignments would be performed.

With the equipment set on their foundations, aboveground piping and electrical activities can be completed. Piping and electrical cable would be terminated at equipment interfaces. High-voltage bus duct will be installed between the STG and generator step-up transformer. The final construction activities will include switchyard installation, site paving, and control system installation and programming. Once systems are installed and complete, commissioning will begin. Commissioning activities include operating pumps and motors, opening and closing valves, cleaning pipe systems by water flushes and air blows, and energizing equipment. Equipment is operated isolated from other systems to ensure proper operation. Once systems are verified the plant as a whole is operated to ensure all systems function correctly. During start-up, all systems are operated and steam is generated to perform steam blows, which are used to clean the steam piping. Once the steam lines are cleaned steam is introduced into the steam turbine. Once the plant is running reliably, testing is performed to ensure emissions and performance guarantees are met.

Concrete, mechanical, and electrical works would be performed over a period of months, with the aid of graders, rollers, front loaders, dump trucks, trenching machines, concrete mixer and pump trucks, cranes, and pick-ups. Approximately 60,000 cubic yards of concrete will be used to construct the power block and heliostat fields.

Some of the above areas may impinge on areas intended for the later stages of solar field erection. As solar field erection nears completion in the power block area, temporary construction mobilization areas would be reduced as required. Solar field equipment and material laydown areas would be rotated through the site on the quadrants currently being assembled.

Miscellaneous, non-vehicle, motorized equipment will also be used over the length of the job, such as welding machines and compressors.

6.8 Thermal Medium Processing

The HTF system hot and cold tanks would be first preheated to help prevent against thermal shock to the tank and foundation. The cold tank, for example, will be maintained at the preheat temperature for at least a week or longer before fluid salt is pumped into the tank. It is expected to take approximately 2 to 3 months to melt and load the complete volume of salt. An external recirculation loop with a heater will then raise the temperature and maintain it at 550° F.

HTF processing will take place in an area surrounded by temporary earth dikes to prevent potential migration of the salt from the processing area with storm water. Incidental spills of salt would be cleaned up. In the event of inclement weather conditions, stockpiles and storage sacks of salt would be covered with plastic to prevent potential contact with storm water.

6.9 Gravel, Aggregate, and Concrete

Gravel will be required for the surfacing of roads, parking areas, and for use in concrete. A geotechnical investigation will provide information necessary to determine if adequate aggregate can be generated on site. Based on visual observations of the site, it appears that gravel sources within the grading area of the Site may be available. If on site gravel/sand is available (in quantity and quality), a portable rock processing operation will be used to generate select aggregate from on site sources. The rock processing operation will include screens, crushers, and conveyors to generate material that meets the project requirements.

If adequate material is not available on site, it is proposed that gravel and aggregate be generated from a nearby borrow source, located north west of the site, along Pole Line Road, near Peavine Creek or purchased from a nearby commercial source. Nye County operates a similar borrow pit to generate aggregate for road construction purposes, and the "Community of Tonopah" operates a similar borrow pit where aggregate is obtained. If this option is selected, the mining, screening, and crushing operation would take place at the borrow pit location. Until test pits are performed as the site, and at the borrow pit location, it is not know which option will be selected.

The construction of the project will require a large quantity of concrete delivered to the site over the duration of the construction timeframe. Two options exist to serve the project needs. First, a portable concrete batch plant can be mobilized and used to batch the concrete necessary for the project. The second option is to obtain concrete from a commercial source nearby.

6.10 Electrical Construction Activities

The transmission line will be constructed using steel poles. Foundation holes for the tower legs will be excavated, forms constructed, reinforcing bars installed, and concrete poured. The structures will be assembled in sections at a staging area and then transported to the site by truck or helicopter, placed by crane or helicopter, and bolted to the foundations. The design of the transmission line will be in accordance with standards established by the utility to which the project interconnects.

Before conductor installation begins, temporary guard structures will be installed at road crossings and other locations where the new conductors may inadvertently come into contact with electric or communications facilities and/or vehicular traffic during installation. These guard structures consist of one or two poles on either side of the feature crossed with a "V"-shaped cargo net tensioned between the guard structures.

The actual conductor-stringing operation begins with the installation of rollers attached to the cross arm of the transmission structure. The rollers allow the individual conductors to be pulled through each structure until the conductor is ready to be pulled up to the final tension position. When the pull and tension equipment is set in place, a sock line (a small cable used to pull in the conductor) is pulled from tower to tower using ground equipment. After the sock line is installed, the conductor is attached to the sock line and pulled in, or strung, using the tension-stringing method. This involves pulling the conductor through each tower under a controlled tension to keep the conductor elevated above crossing structures, roads, and other facilities. After the conductor is pulled into place, tension is adjusted to a pre-calculated level. The conductor is then clamped to the end of each insulator as the rollers are removed. The final step of the conductor installation is to install vibration dampers and other accessories.

6.11 Aviation Lighting

Aviation lights will be installed according to the recommendations of U.S. Department of Transportation Federal Aviation Administration's Advisory Circular, AC 70/7460-1K, Obstruction Marking and Lighting.

6.12 Site Stabilization and Protection

The applicant would restore all temporarily disturbed areas to their preconstruction conditions, as required by the BLM. These include temporary construction areas and access roads as well as transmission alignments, and the aggregate borrow area as required. These areas would be regraded and revegetated to restore them to preexisting conditions.

It is expected that site stabilization will include soil binders, geo-grid or the use of aggregate surfacing to allow the movement of maintenance vehicles and mirror wash water trucks to travel within the solar array. Other procedures for Site stabilization and protection are discussed in Sections 4.9 and 4.10.

6.13 Low-Impact Development Methods

Extensive grading of the site would be limited to the power block areas, receiver tower, the ditches, and the major access roads (asphalt roads between power blocks and gravel roads servicing the receiving towers from the power blocks). With the heliostat array fields, grading cuts and fills would be limited, only as required to obtain smooth graded planes.

All vegetation within the heliostat array fields would be cut or removed to the soil surface to reduce the risk of fire. Occasional cutting of the vegetation would be required to control plant re-growth. All cut vegetation would not leave the site, but would buried, burned, or composted onsite to limit waste disposal. Heliostat foundations may consist of steel posts with concrete foundations or driven concrete filled steel pipes (exact method to be determined at a later date). Some re-grading for maintenance would most likely be required within the access road due to soil erosion and regular use.

Because the proposed site is located on federal land under the control of the BLM, the project is not under the direct authority of Nye County. However, for design purposes, the erosion and sedimentation control BMPs will be engineered to meet the requirements of the County, unless other specific direction is provided by the BLM. Construction of the project would also be subject to requirements of the state National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with Construction Activities. BMPs would be developed and implemented to provide an effective combination of erosion and sediment controls.

Source controls and structural controls are proposed for management erosion and sedimentation as discussed in Section 4.9.

Because low-impact development practices will be incorporated into the project design, construction, and operation, the increase in sediment yield from the Site is not expected to be substantially greater than pre-project condition.

6.14 Decommissioning and Reclamation

The procedures described for decommissioning are designed to ensure public health and safety, environmental protection, and compliance with applicable regulations. It is assumed that decommissioning would begin 30-50 years after the commercial operation date of the solar plant.

The project goals for site decommissioning are as follows:

- Remove above ground structures unless converted to other uses;
- Restore the lines and grades in the disturbed area of the site to match the natural gradients of the site; and
- Re-establish native vegetation in the disturbed areas.

The proposed implementation strategy to achieve the goals for site decommissioning could include the following:

- Use industry standard demolition means and methods to decrease personnel and environmental safety exposures by minimizing time and keeping personnel from close proximity to actual demolition activities to the extent practical;
- Plan each component of the decommissioning project such that personnel and environmental safety are maintained while efficiently executing the work;
- Conduct pre-decommissioning activities such as final decommissioning and restoration planning that addresses the "as-found" site conditions at the start of the project;
- Remove all residual materials and chemicals from the Site prior to demolition for reuse at other facilities or for proper disposal at licensed facilities;
- Demolition of the above-ground structures (dismantling and removal of improvements and materials) in a phased approach while still using some items until close to the end of the project. For instance, the water supply, administrative building and some electrical power components will be modified to be used until very late in the decommissioning project;
- Demolition and removal of below-ground facilities (floor slabs, footings, and underground utilities) as needed to meet the decommissioning goals;
- Soils cleanup, if needed, with special attention applied to retention pond and hazardous materials use/storage areas to ensure that clean closure is achieved;
- Disposal of materials in appropriate facilities for treatment / disposal or recycling;
- Recontouring of lines and grades to match the natural gradient and function of the site; and
- Revegetation with native plants.

Although various types of decommissioning and demolition equipment will be utilized to dismantle each type of structure or equipment, dismantling will proceed according to the following general staging process. The first stage consists of dismantling and demolition of above-ground structures to be removed. The second stage consists of concrete removal as needed to ensure that no concrete structure remains within 3 feet of final grade (i.e., floor slabs, below-ground walls, and footings) as appropriate. The third stage consists of removal/dismantling of underground utilities within 3 feet of final grade. The fourth stage is excavation and removal of soils, and final site contouring to return the originally disturbed area of the site to near original conditions while disturbing as little of the other site areas as is practical.

Above ground demolition entails breakdown and removal of above-ground structures and facilities. Residual materials from these activities would be transported via heavy haul dump truck to a central recycling / staging area where the debris will be processed for transport to an off site recycler. A project recycle center (either at each power unit as the work progresses or at the central admin area) would be established to:

- Size reduce and stage metals and mirrors for transport to an off site recycler;
- Crush concrete and remove rebar;
- Stockpile concrete for later use at the Site;
- Stage rebar for transport to an off site recycler, and

- Temporarily store and act as a shipping point for any hazardous materials to an approved TSD facility.

The strategy for demolition consists of use of mechanized equipment and trained personnel in the safe dismantling and removal of the following above-ground structure:

- Heliostats and related equipment using low environmental impact equipment;
- Towers using explosives to put the towers on the ground, then conventional heavy equipment to size reduce and transport for recycling (this is the industry standard for safe demolition of large towers and massive concrete structures);
- Removal of the turbine generators, condensers and related equipment, transmission lines and towers, and above ground pipelines using conventional demolition equipment and techniques; and
- Near the very end of the project, the removal of site related fencing.

The below-ground facilities to be removed include concrete slabs and footings that would remain within 3 feet of final grade at the end of the project. It is anticipated that any and all site related piping and utilities, including water lines, below ground electric / control / communication lines, and gas lines would be completely removed, regardless of the depth below final grade. These materials would be excavated and transported to the recycling area(s) for processing and ultimate recycling. The resulting trenches would be backfilled with suitable material of similar consistency and permeability as the surrounding native materials and compacted to 85 percent relative compaction.

The need for, depth and extent of contaminated soil excavation will be based on observation of conditions and analysis of soil samples after removal of the evaporation pond and hazardous materials storage areas, and upon closure of the recycling center(s) and waste storage areas using during decommissioning. At this time, removal of contaminated soil is assumed not to be needed. If required, removal would be conducted to the extent feasible and as required to meet regulatory cleanup criteria for the protection of groundwater and the environment. If contaminated soil removal is required, the resulting excavations would be backfilled with native soil of similar permeability and consistency as the surrounding materials and compacted to 85 percent relative compaction.

Recontouring of the site would be conducted using standard grading equipment to return the land to match within reason the previously existing surface and surrounding grade and function. Grading activities would be limited to previously disturbed areas that require recontouring. Efforts would be made to disturb as little of the natural drainage and vegetation as possible. Concrete rubble, crushed to approximately 2-inch minus size, would be placed in the lower portions of fills, at depths at least 3 feet below final grade. Fills would be compacted to approximately 85 percent relative compaction by wheel or track rolling to avoid over-compaction of the soils. To the extent feasible, efforts would be made to place a layer of coarser materials at the ground surface to add stability.

After recontouring, the Site would be revegetated using native plants where appropriate. This would be conducted with a native seed collection company.

7. STATUS OF AGREEMENTS

7.1.1 Power Purchase Agreements

The Applicant does not have an executed Power Purchase Agreement at the time of the filling of this POD. Any change to this status will be brought to the attention of the BLM.

7.1.2 Interconnect Agreements

The Applicant has filed filled an application for interconnection for this project and a Facilities Study is underway. Updates to the application filed, or any new applications for interconnection associated with this project will brought to the attention of the BLM.

8. OPERATIONS AND MAINTENANCE

8.1 Overview

Management, engineering, administrative staff, skilled workers, and operators would serve the solar plant. It is expected to employ up to 40-45 full-time employees during operation and 400-500 during project construction. The facility may be operated up to 7 days a week, and 10 or more hours per day. The facility would be expected to have an annual availability of up to 92 to 95 percent (of no cloudy, daylight hours)

The facility may be operated in one of the following modes:

- The facility could be operated up to its maximum output as dictated by the available solar insolation and the available thermal storage, for as many hours per year as possible.
- The facility would be placed in standby mode every night when the solar insolation or thermal energy storage level drops to a point which results in the STG dropping below its minimum load.
- A full shutdown would occur if forced by equipment malfunction, transmission line disconnect, or scheduled maintenance.

8.2 Maintenance

Long-term operation of the facility would include periodic maintenance and overhaul of all balance-of-plant and solar facility equipment such as STG, pumps, piping, etc. in accordance with manufacturer recommended schedules. Periodic cleaning of the heliostats with demineralized water will be necessary to maintain the desired mirror reflectivity.

Routine inspections of substation and electric transmission line would be conducted by certified site personnel on a monthly basis or as needed under emergency conditions. All of the substation structures

will be inspected from the ground on an annual basis for corrosion, misalignment, and foundation condition. Ground inspection will include the inspection of hardware, insulator keys and conductors.

Regular inspection of electric lines, support systems, and instrumentation and controls is critical for the safe, efficient, and economical operation of the project. Various inspection processes, including aerial inspection, ground inspection, and climbing may be conducted. Ground inspection includes checking of the hardware, insulators, and conductors for corrosion, breaks, broken insulators and failing splices. The frequency of inspection may vary depending on factors such as the age of the system, structure type, and vegetation conditions.

8.3 Operations Workforce and Equipment

It is planned that plant personnel will be on site in two 12-hour shifts, seven days a week to ensure that the facility is staffed at all times. A full-time staff will be required for operations and maintenance of the Power Plants: including one operator for every 12-hour rotating shift, four relief operators, four maintenance technicians, four mirror washers, one to two process/performance engineer, one maintenance manager, and five to seven administrative staff members per day. An additional part-time staff of five to 15 subcontractor personnel will be on site daily to conduct occasional maintenance of the facility, including cleaning or repairing equipment; system testing; removing, repairing, and/or installing insulation before and after maintenance; scaffold installation and removal; and personnel facility-related activities.

9. ENVIRONMENTAL CONSIDERATIONS

9.1 Resource Values and Environmental Concerns

9.1.1 Biological Resources

Biological resources potentially affected by the proposed project include vegetation, wildlife, corridors, and riparian resources. Potential impacts to these resources may be either directly or indirectly impacted by the project and may be either permanent or temporary in nature. Examples of potential impacts as they pertain to the proposed project are described below.

- **Direct:** Any alteration, disturbance, or destruction of biological resources that would result from Project-related activities is considered a direct impact. Examples include clearing vegetation, encroaching into wetlands, diverting natural surface water flows, and the loss of individual species and/or their habitats.
- **Indirect:** As a result of Project-related activities, biological resources may also be affected in a manner that is not direct. Examples include elevated noise, dust, misc. air emissions, soil compaction, increased human activity, decreased water quality, and the introduction of invasive wildlife (domestic cats and dogs) and plants (weeds or other non-native species).

- **Permanent:** All impacts that result in the long-term or irreversible removal of biological resources are considered permanent. Examples include constructing a building or permanent road on an area containing biological resources.
- **Temporary:** Any impacts considered to have reversible effects on biological resources can be viewed as temporary. Examples include the generation of fugitive dust during construction, or removing vegetation for underground pipeline trenching activities and either allowing the natural vegetation to recolonize or actively revegetate the impact area. Surface disturbance that removes vegetation and disturbs the soil is considered a long-term temporary impact because of slow natural recovery in arid ecosystems. Therefore, all such impacts in the project area are considered permanent.

Although no channels or drainages appear to be present on the Site, shallow channels may convey flow during storm events and spring runoff. During the general survey process, any jurisdictional wetlands/waters detected on the Site will be formally delineated per Army Corps of Engineers (ACOE) protocol. If any are identified and determined to be jurisdictional, permits for impacts to jurisdictional waters would be required.

Research and surveys are necessary to determine exactly how the potential impacts listed above may affect biological resources on the Site. Biological surveys will are scheduled to be underway for the project in May 2009. The survey area is indicated on **Figures 17 and 18, Biological & Cultural Survey Areas and Biological & Cultural Survey Area at Substation.** A review of the Tonopah Resources Management Plan indicates that the Site contains a salt desert shrub vegetation type. The Tonopah Resource Area is comprised of a broad range of individual and overlapping types of wildlife habitat including mule deer, antelope, desert bighorn sheep, rocky mountain elk, waterfowl, sage grouse and raptors. There are several special status species, both plant and animal, in the Resource Area including the Williams combleaf (*Polyctenium williamsiae*), desert tortoise (*Gopherus agassizii*) and Railroad Valley springfish (*Crenichthys nevadae*). Focused surveys, agency consultation, project planning, design and permitting, and implementation of appropriate mitigation measures will ensure that potential impacts to biological resources are either avoided and/or minimized to the maximum extent feasible. Proposed project design features and mitigation measures could include the following.

- All construction areas will be minimized by providing taped and flagged boundaries to delineate where surface disturbance will not be allowed to occur. The Project Environmental Compliance staff will review all site plans and provide written approval prior to any surface disturbance. Setting and flagging construction area boundaries will limit surface disturbance and habitat impacts only to those areas needed for construction, thereby preventing unnecessary impacts.
- Off-road travel will be prohibited in sensitive biological areas and all native habitats during construction and operation. Such areas will be posted prior to initiation of construction and parking areas will be designated as appropriate.
- Speed limits on and near the Site will be posted and limits will be developed with consideration for potential wildlife mortality, in cooperation with BLM.
- An environmental awareness program will be developed to educate employees about sensitive biological resources and to provide background and reasons for restrictions, legalities, and appropriate procedures to be followed. This measure will be implemented prior to construction,

and written material and other information will be provided to employees at project orientation. This information also will be provided to all contractors and subcontractors that will be working at the job site.

- A trash and litter control program will be developed for the project in order to reduce the possibility of animals ingesting or becoming entangled in foreign matter. In addition, trash control will reduce predator attraction and consequent increased predation, and will serve to increase overall pride in the area and foster environmental awareness.
- Restoration of disturbed right-of-ways and other temporary disturbance areas in native habitat will follow recommended procedures including ripping, seeding, and mulching, as appropriate. Seed mixtures will include shrubs and other species of utility as wildlife habitat. This measure will provide mitigation for temporarily-disturbed areas and will restore habitat for use by wildlife.
- Field surveys to determine the potential for the site to support sensitive wildlife will be conducted. If it is determined that state or federally protected species and or their habitats are located within the site, assistance to BLM in completing consultation pursuant to Section 7 of the Endangered Species Act and assistance to the USFWS and NDOW to mitigate any adverse effects will be provided. Unavoidable impacts to habitats of federal, as well as state, listed threatened or endangered species will be mitigated as appropriate.

9.1.2 Cultural Resources

Ground-disturbing construction activities have the potential to directly impact cultural resources by altering site integrity and the qualities that make the resources significant. In addition, in the case of built resources, impacts can occur to the setting of a resource, even if the resource is not physically damaged.

The Proposed Tonopah Resource Management Plan and Final Environmental Impact Report (BLM 1994) indicates that prehistoric site types known to occur in the area include long-term habitation sites, temporary camps, task specific sites, pinyon caches, scatters of heat altered rock, rock shelters, petroglyphs and pictographs, rock alignments including "geoglyphs," and quarry sites. Sensitive locations for prehistoric sites include areas near permanent and seasonal water sources, upland pinyon-juniper zones and upper bajada slopes. During the Late Pleistocene, lakes existed within eight of the valleys in the RMP area. During the Holocene, some of these same areas may have supported marshy environments. These lake margins and marshy areas are sensitive areas for cultural and paleontological resources. Paleontological resources in the RMP area are found in geological formations or unnamed strata. Additional fossils may be found in many other formations which occur in the RMP area only in the subsurface.

Historic site types known to occur with the RMP area include the remains of homesteads and mining camps, townsites, Chinese borax mines, charcoal kilns and platforms, minim/milling sites, trash dumps, trails, roads, and railroad grades.

Figure 17 Biological & Cultural Survey Areas

Figure 18 Biological & Cultural Survey Area at Substation

Prior to Site construction, the applicant would survey the Site and inventory and evaluate any cultural resources. The survey area for cultural resources is indicated on **Figures 17 and 18, Biological & Cultural Survey Areas and Biological & Cultural Survey Area at Substation.** Appropriate consultation including BLM consultation with the State Historic Preservation Office (SHPO) and Native Americans in addition to project planning and design, and implementation of relevant mitigation measures will ensure that potential impacts to cultural resources are either avoided and/or minimized to the maximum extent feasible. Proposed project design features and mitigation measures could include the following:

- Additional cultural resources inventory will be conducted for the Site. This inventory may include a pedestrian field survey of the potential area of disturbance to locate previously identified cultural resources as well as to survey areas that have not yet been reviewed. Upon completion of surveys, the applicant will consult with the SHPO for Section 106 compliance for the project, inclusive of the preparation of a Cultural Resources Technical Report. The report will contain recommendations as appropriate on how to address any resources found during the records search and ground survey.
- Wherever possible, the applicant will avoid cultural resource sites identified as eligible for inclusion on the NRHP. Where avoidance is infeasible, effects to resources will be mitigated through a treatment plan developed through consultation between BLM, SHPO, and applicable Tribes.
- A paleontological survey will be conducted to determine the potential for paleontological resources at the site. This information will be included in the Cultural Resources Technical Report. If there is potential for paleontological resources, a paleontological monitoring program will be developed to minimize any impacts to those resources during construction.
- Prior to the start of project construction, a cultural resources specialist will be designated to implement the cultural resource monitoring and mitigation plan. This will include a programmatic agreement and/or an Unanticipated Discovery Plan.
- Prior to the start of project construction, the cultural resources specialist will conduct a worker education session for the construction crew and supervisory personnel to explain the importance of and legal basis for the protection of significant archaeological resources. Construction crews will be briefed regarding identification of suspected new sites, reporting and preservation of existing and suspected new sites.
- A cultural resources monitor will be present at the construction site at times when excavation (subsurface disturbance) is taking place in areas of high cultural sensitivity. These areas will be identified by the cultural resources specialist.
- If a new cultural resources site is discovered during construction, and determined to be significant, the cultural resources specialist will notify and implement a mitigation plan in accordance with federal and state regulations on public lands.
- The cultural resources specialist will arrange for the curation at a qualified curation facility of any cultural materials collected during the construction monitoring and mitigation program.

9.1.3 Land Use

The proposed project is located on unincorporated lands administered by the BLM within Nye County, Nevada. The project area is guided by the Tonopah Planning Area Proposed Resources Management Plan/Final Environmental Impact Study (PRMP/FEIS). The Tonopah RMP was approved in October 1997 and is scheduled for revision beginning Fiscal Year 2009. Based on a review of the PRMP, the project Site appears not to be subject to any grazing allotments, herd management area boundaries, right-of-way avoidance areas, withdrawals, areas of critical environmental concern (ACEC), recreation opportunity spectrums, fluid mineral potential, mineral leasing restrictions, or fire management zones. Development of the proposed project and any existing land use restrictions would be discussed with the BLM prior to environmental review.

9.1.4 Native American Tribal Considerations

As with any project site, the potential also exists for resources to be unearthed during project construction. As such, during the planning and permitting process, BLM consultation with Native Americans in compliance with Executive Orders regarding Government-to-Government relations with Native Americans and other federal and state laws and regulations would take place.

9.1.5 Recreation and OHV Conflicts

The Tonopah Resource Management Area offers a wide variety of recreation opportunities such as hunting, camping, off-highway vehicle (OHV) use, hiking, photography, historical sightseeing, and OHV competitive events. Through aerial photo research and site reconnaissance it is known there is an existing OHV road that provides access from Pole Line Road to the sand dunes "Crescent Dunes". The location of the road in relation to the project can be seen in **Figure 3, Project Site Plan**. According to the RMP, the Site is located in an area that is "Limited to Existing Roads and Closed to Competitive Events" as indicated on **Figure 19, BLM OHV Area**. The project was located within the Site so as to not affect the existing OHV Road.

9.1.6 Other Environmental Concerns

9.1.6.1 Aesthetics

The project will change the visual appearance of the area. When viewed from eye level, during most hours of the day, the solar field would be relatively unobtrusive, with the power block only slightly visible in the distance (if at all), and the view of the project will be dominated by the central tower and receiver. Operations would require onsite nighttime lighting for safety and security. To reduce offsite lighting impacts, lighting at the facility would be restricted to areas required for safety, security, and operation. Exterior lights would be hooded, and lights would be directed onsite so that light or glare would be minimized. Low-pressure sodium lamps and fixtures of a non-glare type would be specified. Switched lighting would be provided for areas where continuous lighting is not required for normal operation, safety, or security; this would allow these areas to remain un-illuminated (dark) most of the time and thereby minimizing the amount of lighting potentially visible offsite. There will be a small amount of additional visible nighttime lighting associated with the project structures and open site areas. At times when lights

Figure 19, BLM OHV Area

are turned on, the lighting will not be highly visible offsite and would not produce offsite glare effects. The offsite visibility and potential glare of the lighting would be minimized by specification of non-glare fixtures and placement of lights to direct illumination into only those areas where it is needed.

To help reduce the visual impact created by outdoor lighting, the following mitigation measures shall be adopted:

- Lights shall be directed on site so that significant light or glare shall not be created. Highly directional, high-pressure sodium vapor fixtures shall be used.
- Nighttime backscatter illumination shall be avoided by directional shielding of lights and providing on/off switch at the bottom taller equipment.
- Switched systems shall be used to allow reduction of light in areas where work is not ongoing and where light is not needed for safety reasons. All light switches shall be clearly identified.

Project construction activities typically would occur during normal Monday through Friday working hours, although nighttime activities may occur at certain times during the construction period depending on the project schedule. When and if nighttime construction activities take place, illumination would be provided that meets State and Federal worker safety regulations. To the extent possible, the nighttime construction lighting would be erected pointing toward the center of the site where activities are occurring, and would be shielded. Task-specific lighting would be used to the extent practical while complying with worker safety regulations. In spite of these measures, there may be times, when and if there is nighttime construction, when the Site may temporarily appear as a brightly lit area as viewed from nearby locations.

Construction of the project's transmission line would involve installation of steel power poles. The insulators will be made of a non-reflective and non-refractive material, and the conductors will be non-specular (i.e., their surfaces will have a dulled finish so that they do not reflect sunlight). The proposed routing would follow the existing lines.

The BLM evaluates federally-managed lands under its Visual Resources Management (VRM) system. The proposed project Site is located in an areas designated by the BLM as Visual Resource Management (VRM) Class IV (BLM, 1994) as indicated on **Figure 20, BLM VRM Map**. The BLM's objective on VRM Class IV lands is to provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. Therefore, visual resource management is not expected to hinder solar facility development within the Site. However, the project would be evaluated by the BLM using the Visual Contrast Rating System to minimize visual impacts and ensure that measures are applied to mitigate potentially adverse visual impacts. Key observation points will be from the Pole Line Road and the dunes. Project design features that could mitigate visual impacts include:

- Project equipment other than the solar arrays would have non-reflective surfaces and neutral colors to minimize their visual impacts to the extent practicable.
- A paint color acceptable to the BLM would be used on all project facilities that can be painted to blend the facility with the existing setting.

Figure 20, BLM VRM Map

- Nighttime lighting would be limited to areas required for operations or safety and would be directed on site to avoid backscatter. Whenever possible, nighttime lighting would be directed or shielded from major roadways.
- Lighting at high illumination areas not occupied on a continuous basis would be controlled by switches or motion detectors to light the areas only when occupied.

9.1.6.2 Air Quality

Ambient air quality is protected by Federal, State, and local regulations. The EPA has established National Ambient Air Quality Standards (NAAQS) for criteria pollutants for the purpose of protecting human health (primary standards) and public welfare (secondary standards). These criteria pollutants are: nitrogen dioxide (NO_2), carbon monoxide (CO), ozone, SO_2, lead (Pb), PM_{10}, and $PM_{2.5}$.

The EPA established designations for a new 8-hour ozone standard, which are now in effect while the 1-hour ozone standard was revoked on June 15, 2005 in most areas, including the Project area. In addition to the Federal NAAQS, State ambient air quality standards have been established for Nevada. The Nevada ambient air quality standards are the same as the Federal standards.

The proposed Project is potentially subject to a variety of Federal, State, and local regulations pertaining to the construction or operation of air emission sources. The CAA, 42 USC 7401 et seq., as amended in 1977 and 1990, and Title 40 CFR Parts 50 through 99 are the basic Federal statutes and regulations governing air pollution in the United States. In general, the Bureau of Air Pollution Control (BAPC) of the Nevada Department of Environmental Protection (NDEP) is the agency responsible for air quality-related permitting in Nevada. The Nevada Bureau of Air Quality Planning is responsible for air quality monitoring, planning and program management.

The proposed project will generate air emissions during both construction and operation. Construction emissions for the proposed project will be closely evaluated using site- and project-specific data during the project design, permitting and certification process. The main sources of emissions from the proposed project would be short-term emissions during construction. Construction-related emissions will include the exhaust from construction equipment (including vehicles transporting personnel, equipment, and supplies) and fugitive dust and particulate matter (PM_{10}) from grading, earth moving, and equipment/vehicles traveling on paved and unpaved roads.

Another source of construction related emissions comes from the use of diesel powered construction equipment which has been known to produce ozone precursor emissions and combustion related particulate emissions. To help address these emissions the project would include standard mitigation measures for construction equipment.

The proposed project is anticipated to generate very little or no NOx, CO, or VOC pollutants during its normal operation. The project would not utilize supplemental gas firing, and would therefore generate very little air pollution. Additional studies regarding air emissions from the proposed project would be conducted to verify exact air emissions and impacts. The Applicant will obtain the necessary construction and operation permits from the BAPC/NDEP. The Applicant will also work with the BAPC/NDEP to determine any needed mitigation measures.

9.1.6.3 Geologic Hazards and Soils

According to the BLM Tonopah Field Office PRMP/FEIS (1994), the soils in the RMP area are mainly mineral soils of two types: those which do not have water continuously available for three months when the soil is warm enough from plant growth (Aridisols) and soils showing little evidence of the soil forming process, the development of horizons or layers (Entisols). The surface soils on the Site are characterized by sandy-clay and wind-eroded gravels. The areas of undisturbed surface gravels are stable and tend not to be dust producing. Areas of disturbance could become dusty or muddy.

Proposed project design features could include the following:

- The design of the project would be in accordance with all applicable federal, state, and county building and construction ordinances.
- Engineering and construction requirements for the project would incorporate the necessary precautions to successfully operate the project in a seismically active area.
- Site-specific geotechnical assessments to determine the presence or absence of liquefiable deposits and other geotechnical hazards would be conducted. Design-level geotechnical investigations, including test borings at selected locations, as well as an analysis of existing data to assess the possibility of liquefaction and other hazards, would be conducted as part the assessment. Design of the project would include appropriate measures to mitigate for any hazards identified during the assessment.
- An engineering geologist(s), certified by the State of Nevada, would be assigned to the project to carry out the duties required by the Nevada Building Code (NBC), including preparation of an Engineering Geologic Report, and to periodically monitor geologic conditions during construction, approve actual design features and mitigation measures used to protect the project from geologic hazards and prepare the final Geologic Grading Report.

9.1.6.4 Mineral and Energy Resources

The state of Nevada is a large producer of gold as well as oil and gas. In addition, Nevada has the largest BLM mineral management program. The state is also a producer of geothermal energy. A variety of mineral resources are present in the Resource Area including sand and gravel, cinders, basalt, and decorative rock. Further study of the mineral and energy resources located both on and near the Site would be contained in future analyses.

9.1.6.5 Noise

The proposed project is located in an undeveloped area where existing noise levels are likely to be relatively low. Noise sensitive receptors can include facilities or areas where excessive, disconcerting, or high levels of noise would conflict with the intended use (e.g., residential areas, hospitals, schools, certain recreation areas, etc.).

During construction, various types of heavy equipment would be used that could result in a temporary increase in noise levels. Additionally, during operation of the facility, use of pumps, blowers, fans,

generators, compressors, and high-pressure steam blows will contribute to noise emissions in the project vicinity.

Further research will be conducted to determine current noise emissions in the project vicinity and the impact of the proposed project on the noise environment. Project design and mitigation measures could include the following:

- The applicant would evaluate plant noise emissions during the design and permitting phase of the project in accordance with BLM and NDEP guidelines and local requirements (if applicable).
- Prior to construction, the applicant would submit a noise control program to BLM and NDEP (if necessary) for review and approval. Construction noise would be managed to reduce employee exposure and comply with Federal and State standards and County ordinances.
- During the construction and operation phases of the project, the applicant would document, investigate, evaluate, and attempt to resolve all project related noise complaints.

During construction, heavy equipment would be utilized along the proposed right-of-way and could result in temporary increases in noise levels.

9.1.6.6 Water Resources

The project Site is not impacted by obvious drainage pathways. Areas near the Site contain small drainage scars which are periodically wet and may contain water for extended periods during spring runoff. Drainage from this area is primarily shallow sheet flow, infiltration and evaporation.

The perennial yield (safe yield) of the Tonopah Flat groundwater basin sub area is reportedly 6,000 acre-feet per year and the total water rights demand through March 1999 was reportedly 26,724 acre-feet per year. Although there is an apparent groundwater deficit, the estimated committed water rights in the sub area and do not represent the actual groundwater withdrawal and consumption, which are significantly less (Buqo, 2004). The actual groundwater budget in the Tonopah Flat groundwater basin sub area is unknown. There is little data reported regarding well yields and aquifer characteristics in the vicinity of the POD area and further research would be conducted to investigate the quantity and quality of groundwater available.

Because the facility will utilize hybrid cooling technology, the total process and operational water demand is expected to use up to approximately 700 afy. Groundwater would be utilized to meet this demand.

The anticipated construction water demand is approximately 900 afy over the course of the 30-month construction schedule. Construction water demand would be met by pumping groundwater on-site, or through off site wells on a temporary basis.

10. REFERENCES

Buqo, T.S., 2004. *Nye County Water Resources Plan*. Department of Natural Resources and Federal Facilities. August 2004.

National Renewable Energy Laboratory, *United States Solar Atlas*, http://www.nrel.gov/gis/solar.html.

United States Department of the Interior, Bureau of Land Management, *Approved Tonopah Resource Management Plan and Record of Decision*, October 1997.

United States Department of the Interior, Bureau of Land Management, *BLM Instruction Memorandum No. 2007-097*, 2007.

United States Department of the Interior, Bureau of Land Management, *Proposed Tonopah Resource Management Plan and Final Environmental Impact Statement*, October 1994.

ATTACHMENT 2

STANDARD FORM 299 (1/2006)
Prescribed by DOI/USDA/DOT
P.L. 96487 and Federal
Register Notice 5-22-95

APPLICATION FOR TRANSPORTATION AND UTILITY SYSTEMS AND FACILITIES ON FEDERAL LANDS

FORM APPROVED
OMB NO. 1004-0189
Expires: November 30, 2008

NOTE: Before completing and filing the application, the applicant should completely review this package and schedule a preapplication meeting with representatives of the agency responsible for processing the application. Each agency may have specific and unique requirements to be met in preparing and processing the application. Many times, with the help of the agency representative, the application can be completed at the preapplication meeting.

FOR AGENCY USE ONLY
Application Number
Date filed

1. Name and address of applicant *(include zip code)*

Tonopah Solar Energy, LLC
2425 Olympic Boulevard, Suite 500 East
Santa Monica, CA 90404

2. Name, title, and address of authorized agent if different from item 1 *(include zip code)*

Point of contact:
Andrew Wang, (310) 315-2225

3. TELEPHONE *(area code)*
Applicant **(310) 315-2210**
Authorized Agent **Kevin Smith**

4. As applicant are you? *(check one)*
- a. ☐ Individual
- b. ☐ Corporation*
- c. ☑ Partnership/Association*
- d. ☐ State Government/State Agency
- e. ☐ Local Government
- f. ☐ Federal Agency

* *If checked, complete supplemental page*

5. Specify what application is for: *(check one)*
- a. ☑ New authorization
- b. ☐ Renewing existing authorization No.
- c. ☐ Amend existing authorization No.
- d. ☐ Assign existing authorization No.
- e. ☐ Existing use for which no authorization has been received*
- f. ☐ Other*

* *If checked provide details under item 7*

6. If an individual, or partnership are you a citizen(s) of the United States? ☑ Yes ☐ No

7. Project description *(describe in detail)*: (a) Type of system or facility, *(e.g., canal, pipeline, road)*; (b) related structures and facilities; (c) physical specifications *(length, width, grading, etc.)*; (d) term of years needed; (e) time of year of use or operation; (f) Volume or amount of product to be transported; (g) duration and timing of construction; and (h) temporary work areas needed for construction *(Attach additional sheets, if additional space is needed.)*

SolarReserve, LLC proposes to develop a 120 MW concentrating solar power (CSP) facility approximately 10 miles northwest of Tonopah, NV and adjacent to NV Energy's Anaconda substation. Specifically, the project will be located on:

Township 5N, Range 41E, sections 26, 27, 34, 35
Township 4N, Range 41E, sections 2, 3, 10, 11, 12, 13, 14, 15

See Attachment A and supporting Figures for a complete project description.

8. Attach a map covering area and show location of project proposal

9. State or local government approval: ☐ Attached ☑ Applied for ☐ Not required

10. Nonreturnable application fee. ☐ Attached ☑ Not required

11. Does project cross international boundary or affect international waterways? ☐ Yes ☑ No *(If "yes," indicate on map)*

12. Give statement of your technical and financial capability to construct, operate, maintain, and terminate system for which authorization is being requested.

SolarReserve's technology has been demonstrated and proven by one of the world's leading technology conglomerates, United Technologies Corporation (UTC, Nasdaq "UTX"). UTC's subsidiary, Hamilton Sundstrand Rocketdyne, demonstrated the technology at the Solar One and Solar Two power plants in Southern California. UTC granted SolarReserve the exclusive worldwide license to develop power plants using its proven technology. Even more importantly, UTC will stand behind its equipment and technology, providing the guarantees and warrantees necessary to realistically develop these multi-hundred million dollar power projects. SolarReserve's other founding partner is US Renewables Group (USRG), a $575 million private equity firm exclusively focused on renewable power and clean fuel projects. USRG provided SolarReserve with the initial financing to successfully implement this revolutionary technology worldwide. In addition to its backers, SolarReserve has assembled a strong management team to achieve its objectives, including former executives at UTC, head engineers from Solar Two, leading power developers, and the legal and financial experts required to build projects of such magnitude.

(Continued on page 2)

13a. Describe other reasonable alternative routes and modes considered.

See Attachment B.

b. Why were these alternatives not selected?

See Attachment B.

c. Give explanation as to why it is necessary to cross Federal Lands

See Attachment B.

14. List authorizations and pending applications filed for similar projects which may provide information to the authorizing agency. *(Specify number, date, code, or name)*

See Attachment B.

15. Provide statement of need for project, including the economic feasibility and items such as: (a) cost of proposal *(construction, operation, and maintenance)*; (b) estimated cost of next best alternative; and (c) expected public benefits.

See Attachment B.

16. Describe probable effects on the population in the area, including the social and economic aspects, and the rural lifestyles.

See Attachment B.

17. Describe likely environmental effects that the proposed project will have on: (a) air quality; (b) visual impact; (c) surface and ground water quality and quantity; (d) the control or structural change on any stream or other body of water; (e) existing noise levels; and (f) the surface of the land, including vegetation, permafrost, soil, and soil stability.

See Attachment B.

18. Describe the probable effects that the proposed project will have on (a) populations of fish, plantlife, wildlife, and marine life, including threatened and endangered species; and (b) marine mammals, including hunting, capturing, collecting, or killing these animals.

See Attachment B.

19. State whether any hazardous material, as defined in this paragraph, will be used, produced, transported or stored on or within the right-of-way or any of the right-of-way facilities, or used in the construction, operation, maintenance or termination of the right-of-way or any of its facilities. "Hazardous material" means any substance, pollutant or contaminant that is listed as hazardous under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. 9601 et seq., and its regulations. The definition of hazardous substances under CERCLA includes any "hazardous waste" as defined in the Resource Conservation and Recovery Act of 1976 (RCRA), as amended, 42 U.S.C. 9601 et seq., and its regulations. The term hazardous materials also includes any nuclear or byproduct material as defined by the Atomic Energy Act of 1954, as amended, 42 U.S.C. 2011 et seq. The term does not include petroleum, including crude oil or any fraction thereof that is not otherwise specifically listed or designated as a hazardous substance under CERCLA Section 101(14), 42 U.S.C. 9601(14), nor does the term include natural gas.

See Attachment B.

20. Name all the Department(s)/Agency(ies) where this application is being filed.

Bureau of Land Managment, Tonopah Field Station (Tonopah, Nevada)

I HEREBY CERTIFY, That I am of legal age and authorized to do business in the State and that I have personally examined the information contained in the application and believe that the information submitted is correct to the best of my knowledge.

Signature of Applicant	Date **11/05/2008**

Title 18, U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious, or fraudulent statements or representations as to any matter within its jurisdiction.

(Continued on page 3)

APPLICATION FOR TRANSPORTATION AND UTILITY SYSTEMS AND FACILITIES ON FEDERAL LANDS

GENERAL INFORMATION

ALASKA NATIONAL INTEREST LANDS

This application will be used when applying for a right-of-way, permit, license, lease, or certificate for the use of Federal lands which lie within conservation system units and National Recreation or Conservation Areas as defined in the Alaska National Interest Lands Conservation Act. Conservation system units include the National Park System, National Wildlife Refuge System, National Wild and Scenic Rivers System, National Trails System, National Wilderness Preservation System, and National Forest Monuments.

Transportation and utility systems and facility uses for which the application may be used are:

1. Canals, ditches, flumes, laterals, pipes, pipelines, tunnels, and other systems for the transportation of water.
2. Pipelines and other systems for the transportation of liquids other than water, including oil, natural gas, synthetic liquid and gaseous fuels, and any refined product produced therefrom.
3. Pipelines, slurry and emulsion systems, and conveyor belts for transportation of solid materials.
4. Systems for the transmission and distribution of electric energy.
5. Systems for transmission or reception of radio, television, telephone, telegraph, and other electronic signals, and other means of communications.
6. Improved rights-of-way for snow machines, air cushion vehicles, and all-terrain vehicles.
7. Roads, highways, railroads, tunnels, tramways, airports, landing strips, docks, and other systems of general transportation.

This application must be filed simultaneously with each Federal department or agency requiring authorization to establish and operate your proposal.

In Alaska, the following agencies will help the applicant file an application and identify the other agencies the applicant should contact and possibly file with:

Department of Agriculture
Regional Forester, Forest Service (USFS)
Federal Office Building, P.O. Box 21628
Juneau, Alaska 99802-1628
Telephone: (907) 586-7847 *(or a local Forest Service Office)*

Department of the Interior
Bureau of Indian Affairs (BIA)
Juneau Area Office
9109 Mendenhall Mall Road, Suite 5, Federal Building Annex
Juneau, Alaska 99802
Telephone: (907) 586-7177

Bureau of Land Management (BLM)
222 West 7th Ave., Box 13
Anchorage, Alaska 99513-7599
Telephone: (907) 271-5477 *(or a local BLM Office)*

National Park Service (NPS)
Alaska Regional Office, 2525 Gambell St., Rm. 107
Anchorage, Alaska 99503-2892
Telephone: (907) 257-2585

U.S. Fish & Wildlife Service (FWS)
Office of the Regional Director
1011 East Tudor Road
Anchorage, Alaska 99503
Telephone: (907) 786-3440

Note-Filings with any Interior agency may be filed with any office noted above or with the: Office of the Secretary of the Interior, Regional Environmental Officer, Box 120, 1675 C Street, Anchorage, Alaska 99513.

Department of Transportation
Federal Aviation Administration
Alaska Region AAL-4,222 West 7th Ave., Box 14
Anchorage, Alaska 99513-7587
Telephone: (907) 271-5285

NOTE- The Department of Transportation has established the above central filing point for agencies within that Department. Affected agencies are: Federal Aviation Administration (FAA), Coast Guard (USCG), Federal Highway Administration (FHWA), Federal Railroad Administration (FRA).

OTHER THAN ALASKA NATIONAL INTEREST LANDS

Use of this form is not limited to National Interest Conservation Lands of Alaska.

Individual departments/agencies may authorize the use of this form by applicants for transportation and utility systems and facilities on other Federal lands outside those areas described above.

For proposals located outside of Alaska, applications will be filed at the local agency office or at a location specified by the responsible Federal agency.

SPECIFIC INSTRUCTIONS

(Items not listed are self-explanatory)

Item

7 Attach preliminary site and facility construction plans. The responsible agency will provide instructions whenever specific plans are required.

8 Generally, the map must show the section(s), township(s), and ranges within which the project is to be located. Show the proposed location of the project on the map as accurately as possible. Some agencies require detailed survey maps. The responsible agency will provide additional instructions.

9, 10, and 12 - The responsible agency will provide additional instructions.

13 Providing information on alternate routes and modes in as much detail as possible, discussing why certain routes or modes were rejected and why it is necessary to cross Federal lands will assist the agency(ies) in processing your application and reaching a final decision. Include only reasonable alternate routes and modes as related to current technology and economics.

14 The responsible agency will provide instructions.

15 Generally, a simple statement of the purpose of the proposal will be sufficient. However, major proposals located in critical or sensitive areas may require a full analysis with additional specific information. The responsible agency will provide additional instructions.

16 through 19 - Providing this information in as much detail as possible will assist the Federal agency(ies) in processing the application and reaching a decision. When completing these items, you should use a sound judgment in furnishing relevant information. For example, if the project is not near a stream or other body of water, do not address this subject. The responsible agency will provide additional instructions.

Application must be signed by the applicant or applicant's authorized representative.

If additional space is needed to complete any item, please put the information on a separate sheet of paper and identify it as "Continuation of Item".

(For supplemental, see page 4)

SUPPLEMENTAL

NOTE: The responsible agency(ies) will provide additional instructions	CHECK APPROPRIATE BLOCK	
I - PRIVATE CORPORATIONS	ATTACHED	FILED*
a. Articles of Incorporation	☐	☐
b. Corporation Bylaws	☐	☐
c. A certification from the State showing the corporation is in good standing and is entitled to operate within the State.	☐	☐
d. Copy of resolution authorizing filing	☐	☐
e. The name and address of each shareholder owning 3 percent or more of the shares, together with the number and percentage of any class of voting shares of the entity which such shareholder is authorized to vote and the name and address of each affiliate of the entity together with, in the case of an affiliate controlled by the entity, the number of shares and the percentage of any class of voting stock of that affiliate owned, directly or indirectly, by that entity, and in the case of an affiliate which controls that entity, the number of shares and the percentage of any class of voting stock of that entity owned, directly or indirectly, by the affiliate.	☐	☐
f. If application is for an oil or gas pipeline, describe any related right-of-way or temporary use permit applications, and identify previous applications	☐	☐
g. If application is for an oil and gas pipeline, identify all Federal lands by agency impacted by proposal.	☐	☐
II - PUBLIC CORPORATIONS		
a. Copy of law forming corporation	☐	☐
b. Proof of organization	☐	☐
c. Copy of Bylaws	☐	☐
d. Copy of resolution authorizing filing	☐	☐
e. If application is for an oil or gas pipeline, provide information required by Item "I-f" and "I-g" above.	☐	☐
III - PARTNERSHIP OR OTHER UNINCORPORATED ENTITY		
a. Articles of association, if any	☑	☐
b. If one partner is authorized to sign, resolution authorizing action is	☑	☐
c. Name and address of each participant, partner, association, or other	☐	☐
d. If application is for an oil or gas pipeline, provide information required by Item "I-f" and "I-g" above.	☐	☐

* If the required information is already filed with the agency processing this application and is current, check block entitled "Filed." Provide the file identification information (e.g., number, date, code, name). If not on file or current, attach the requested information.

Documentation for III-a and III-b are included in the Supplemental Information.

(Continued on page 5)

NOTICES

NOTE: This applies to the Department of the Interior/Bureau of Land Management (BLM).

The Privacy Act of 1974 provides that you be furnished with the following information in connection with the information provided by this application for an authorization.
AUTHORITY: 16 U.S.C. 310 and 5 U.S.C. 301.
PRINCIPAL PURPOSE: The primary uses of the records are to facilitate the (1) processing of claims or applications; (2) recordation of adjudicative actions; and (3) indexing of documentation in case files supporting administrative actions.
ROUTINE USES: BLM and the Department of the Interior (DOI) may disclose your information on this form: (1) to appropriate Federal agencies when concurrence or supporting information is required prior to granting or acquiring a right or interest in lands or resources; (2) to members or the public who have a need for the information that is maintained by BLM for public record; (3) to the U.S. Department of Justice, court, or other adjudicative body when DOI determines the information is necessary and relevant to litigation; (4) to appropriate Federal, State, local, or foreign agencies responsible for investigating, prosecuting violation, enforcing, or implementing this statute, regulation, or order; and (5) to a congressional office when you request the assistance of the Member of Congress in writing.
EFFECT OF NOT PROVIDING THE INFORMATION: Disclosing this information is necessary to receive or maintain a benefit. Not disclosing it may result in rejecting the application.

The Paperwork Reduction Act of 1995 requires us to inform you that:
The Federal agencies collect this information from applicants requesting right-of-way, permit, license, lease, or certifications for the use of Federal Lands.
Federal agencies use this information to evaluate your proposal.
No Federal agency may request or sponsor and you are not required to respond to a request for information which does not contain a currently valid OMB Control Number.

BURDEN HOURS STATEMENT: The public burden for this form is estimated at 25 hours per response including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding the burden estimate or any other aspect of this form to: U.S. Department of the Interior, Bureau of Land Management (1004-0189), Bureau Information Collection Clearance Officer (WO-630) 1849 C Street, N.W., Mail Stop 401 LS, Washington, D.C. 20240.

A reproducible copy of this form may be obtained from the Bureau of Land Management, Land and Realty Group, 1620 L Street, N.W., Rm. 1000 LS, Washington, D.C. 20036.

ATTACHMENT A

Executive Summary

SolarReserve, LLC (SolarReserve) proposes to develop Tonopah 3 Solar Energy Project, a 120 MW concentrating solar power (CSP) facility adjacent west of NV Energy's Anaconda substation in Nye County, Nevada. The Project incorporates SolarReserve's unique "Solar Power Tower" technology, a proprietary central receiver and molten salt loop system capable of delivering a firm capacity renewable energy resource. The Solar Power Tower design provides dispatchable firm capacity and ancillary services (A/S) such as spinning reserves, regulation, and responsiveness to system fluctuations.

SolarReserve will provide an emissions-free, firm capacity resource that offers a unique capability to store solar energy that can be generated and dispatched when needed. The Solar Power Tower employs a highly flexible design that can provide renewable generation for baseload power or periods of peak demand. The Solar Power Tower technology is capable of optimizing generation to best meet market needs and maximize returns. The ability of the Solar Power Tower technology to collect, efficiently store and dispatch renewable energy provides a clear value proposition that is unique among all renewable options.

SolarReserve delivers a "green-on-green" solution that offers to firm intermittent renewable energy resources, such as wind energy, with reserves sourced by the sun and capable of firm supply and dispatchability. The ability to store renewable energy harvested from the sun and provide a fully dispatchable generation resource with a wide range of ancillary services is a significant added value to grid operations. SolarReserve intends to form a Project specific entity to develop, finance, build, own, and operate the facility with an expected online date of the first project in 2013.

Description of Technology

Solar Power Tower technology provides the unique capability to efficiently store solar energy, thereby enabling solar electricity to be generated and dispatched when desired. The plant consists of three major subsystems: 1) a field of heliostats, 2) the molten salt system, and 3) a conventional steam turbine power generation facilities (see Figure 1). The generation of solar power starts with the heliostats concentrating the solar energy onto a central receiver (step 1). This receiver consists of thin-walled tubes through which molten salt passes, absorbing the solar energy (step 2). The molten salt leaves the central receiver and proceeds to the hot salt thermal storage tank (step 3). Because the molten salt material is very efficient at storing solar energy, the Project provides a firm source of renewable power that can be dispatched when needed. The molten salt then moves through a heat exchanger, which transmits its energy to generate steam. The steam is then sent to a steam turbine generating electricity (step 4). After generation of steam in the steam generator heat exchanger, the molten salt is sent to a cold salt terminal storage tank, (step 5), and the cycle is repeated.

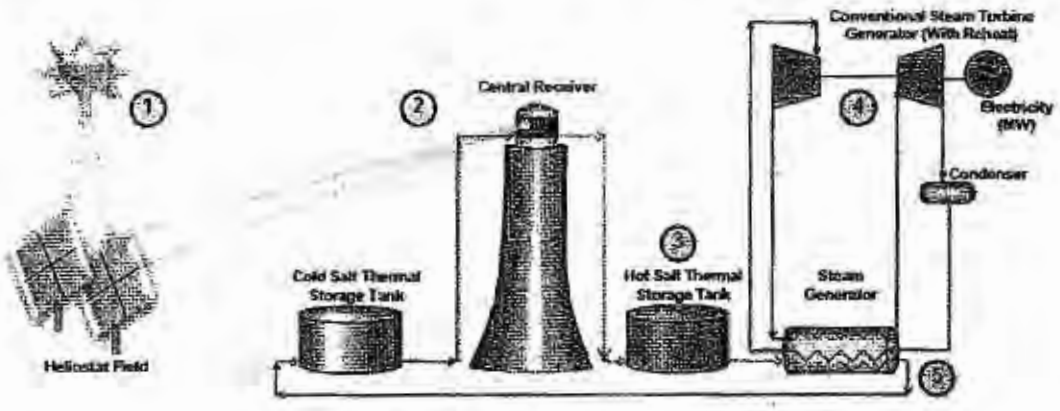


Figure 1 – Solar Power Tower Schematic

SolarReserve's Tonopah 3 Solar Energy Project (Project) is based on technology demonstrated and provided by United Technologies Corporation's (UTC) subsidiary Hamilton Sundstrand Rocketdyne (HSR). The molten salt power tower technology with energy storage was demonstrated on the 10 MW Solar Two project, which operated between 1996 and 1999. Located just east of Barstow, California, both Solar One and Solar Two were joint projects between the U.S. Department of Energy, the Solar Energy Research Institute (now National Renewable Energy Laboratory, NREL), Rocketdyne (now part of United Technologies), and a consortium of investor-owned utilities. Solar One, which operated from 1982 to 1986, was based on direct steam generation technology that is being pursued by other power tower concept providers in the market today. Without an ability to store the thermal energy, Solar One proved to be uneconomical as the loss of the sun's energy (e.g., clouds, night) resulted in a significant drop in plant performance. With Solar Two, HSR incorporated a molten salt loop in the plant enabling the efficient storage of thermal energy (99% efficient over a 24-hour period) and the ability to continue to generate power when the sun was not available. In addition to the ability to deliver solar electricity 24 hours a day, the addition of thermal storage also created the ability to dispatch solar electricity when power is most needed during periods of peak demand. As a result, Solar Two demonstrated a significant increase in overall plant efficiency during its demonstration. Figure 2 shows the Solar Two plant.

In the years since the completion of Solar Two, Solar Power Tower technology has been improved to enhance overall efficiencies and controls. Market conditions and the emergence of renewable portfolio standards have positioned the Solar Power Tower incorporating molten salt technology as the solar technology with the greatest potential to make electricity competitive for utilities and grid operators. Today, SolarReserve holds an exclusive license from UTC for the use and development of the Solar Power Tower plant incorporating the molten salt technology. UTC, a $70 billion diversified technology company, will provide and guarantee the critical plant subsystems.

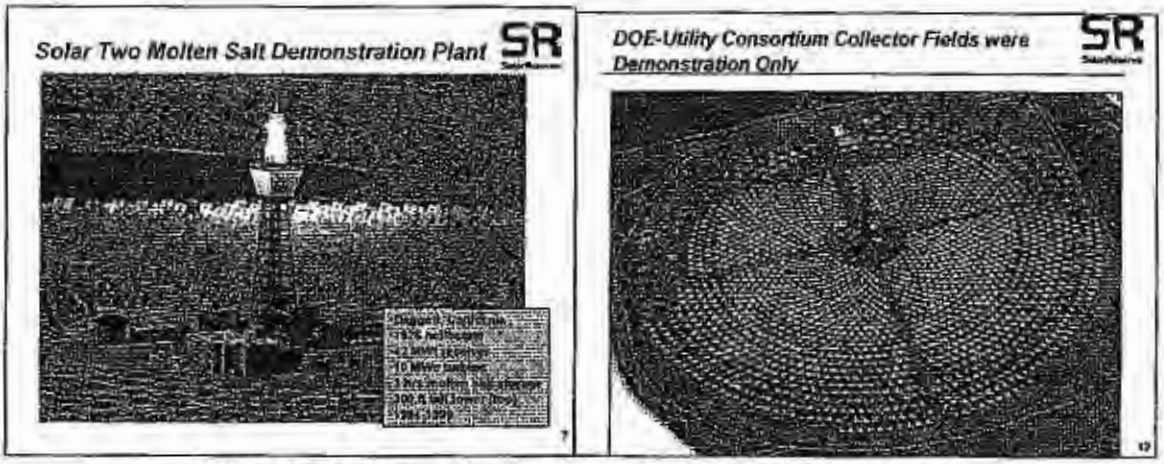


Figure 2 – Solar Two Power Tower Plant Concept Demonstrator

Facility configuration utilizes a single Solar Power Tower to produce a net output of nominally 456,000 MWh delivered over a 9 to 17 hour period (depending on the season) as selected by the Utility. Lower capacity (MW) dispatched can result in longer dispatch periods. The amount of electrical energy delivered to the grid on a daily basis will depend on the solar insolation available that day. However, assuming an annual average hourly incident solar radiation of 2,550 kWh/m^2 per year of direct normal solar incidence, the Project is expected to deliver approximately 456,000 MWh of renewable energy to the grid on an annual basis. Based upon the reference plant design, on an average day during the summer months (June through September), the plant is capable of delivering its full rated net output for between 12 and 17 hours per day depending on the month. On an average day during each of the remaining months of the year, the reference plant is capable of delivering its full rated net output for between 9 and 13 hours per day depending on the month. Table 1 below provides a summary of the power production by month as well as an estimate of the average number of hours per day that the plant runs.

Table 1 – Solar Power Tower Monthly Production (ILLUSTRATIVE)

Period	Solar Irradiation	Thermal Energy Stored	Gross Electric Energy	Net Electric Energy	Net Electric Energy	6x16 Generation	Net Capacity	Dispat Hour
Month	kWh/m^2/mo	MWhth/day	MWhe/day	MWh/day	MWh/month	Hours	MW	hours/d
anuary	194.8	3,299	1,386	1,147	35,561	416	85	10
ebruary	207.8	3,519	1,478	1,224	34,263	384	89	10
March	207.1	3,507	1,473	1,220	37,806	416	91	10
April	227.1	3,846	1,615	1,337	40,120	416	96	11

May	237.7	4,025	1,691	1,400	43,392	416	104	12
June	296.0	5,013	2,105	1,743	52,292	416	120	15
July	232.1	3,931	1,651	1,367	42,370	416	102	11
ugust	202.0	3,421	1,437	1,190	36,875	416	89	10
ptember	207.0	3,506	1,472	1,219	36,569	400	91	10
ctober	190.3	3,223	1,354	1,121	34,739	432	80	9
vember	183.3	3,104	1,304	1,079	32,382	384	84	9
cember	164.9	2,793	1,173	971	30,103	416	72	8
Total	2,550.1	43,186	18,138	15,017	456,474	4,928		

Description of Configuration

The reference plant design includes up to 15 hours of thermal storage capacity that will also allow a utility to shift the delivery of electricity to later in the day or to the following day. This capability to shift electrical power production will allow the Utility to effectively use the Project's generated power during highest price portions of peak demand periods throughout the year. If the Utility wants the ability to shift or delay the delivery of electricity for more than 12 hours, it is possible to increase the storage capacity of the plant to provide for this greater flexibility at a reasonable cost. Table 2 provides additional metrics for the reference plant.

Table 2 – Reference Plant Sizing Configuration

Number of Heliostats	15,000
Approximate Size of Solar Field (acres)	1,500 acres
Height of Receiver Tower (ft)	640 ft
Central Receiver Capacity	540 MWt
Potential Molten Salt storage (MWh)	2,000 MWh (up to 120 MW for 16 hours)
Length of Piping for Molten Salt Loop	Less than 2,000 feet
Steam Generator PMax (MWt)	300 MWt
Steam Generator PMin (MWt)	60 MWt
Plant Hours of Peak Load (MWe) & Hours	120 MW up to 15 hours (June)

For SolarReserve's Tonopah 3 Solar Energy Project, the array of heliostats will track the sun as it crosses the sky. Those mirrors will focus the sun's energy to more than 1,500 times normal intensity, and direct that concentrated renewable energy to a central receiver at the top of the slipform concrete tower. The receiver will consist of approximately 142,500 feet of two inch diameter, high nickel alloy, steel tubing. Upon start-up, molten salt at 550°F will be pumped from the cold salt thermal storage tank to the central receiver. The concentrated solar energy then heats the "cold" molten salt to 1,050°F which then flows down to a high temperature ("hot") thermal storage tank. There the "hot" molten salt can be stored for in excess of 30 days and maintain its temperature at a loss rate of approximately 1.5°F per month.

During times when power generation is scheduled, the high temperature molten salt is pumped through a secondary loop heat exchanger (steam generator) to produce 1050°F superheated steam which in turn is directed to a 120 MW steam turbine generator. Based on the current conceptual design, it is anticipated that the generator condenser will be cooled by a dry-cooling system to minimize water consumption. Water requirements for the Project using dry cooling are expected to be about 200 acre-feet per year.

After leaving the steam generator, the low temperature 550°F molten salt is cycled back to the cold molten salt tank to be subsequently reheated by solar energy by the central receiver.

SolarReserve's Tonopah 3 Solar Energy Project is a flexible design and, as such the configuration of the Project can be tailored to the Utility's needs. The number of heliostats, size of the steam generator, and thermal storage can all be adjusted to better fit the Utility's desired generation and REC profiles. Please see Figure 3 below to see the sizing possibilities that are available for the Reference Plant.

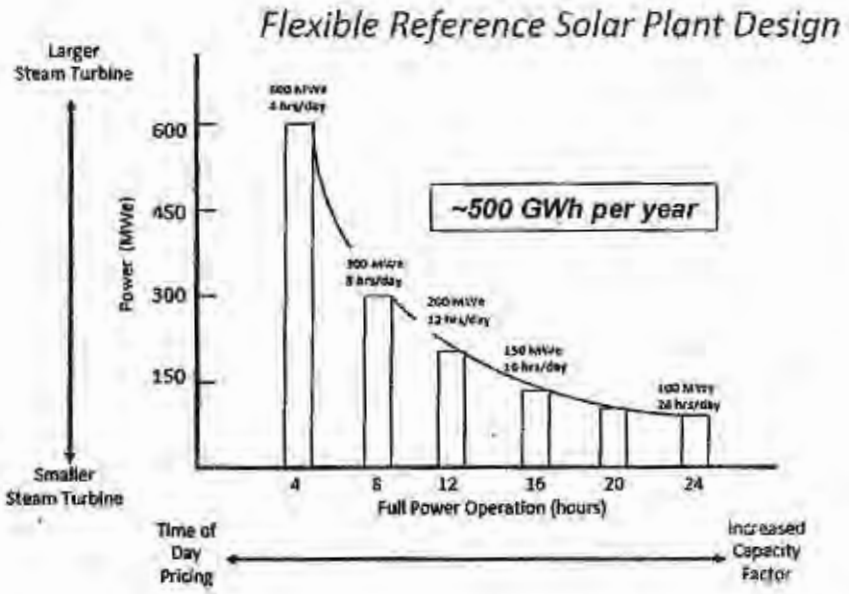


Figure 3 – Plant Sizing Options for Reference Plant

Major Equipment Manufacturers

United Technologies Corporation (UTC), a $70 billion industrial manufacturing conglomerate, is the primary technology supplier in SolarReserve's Tonopah 3 Solar Energy Project. As the 18th largest manufacturer in the United States, two key UTC business units, Hamilton Sundstrand Rocketdyne (HSR) and Pratt & Whitney Rocketdyne (PWR), will be the system suppliers of the molten salt system and heliostats, respectively. UTC's participation ensures the highest standards of quality assurance and cutting edge technology, design and construction management, as well as financial assurances related to the backing of a global manufacturing firm. Balance of plant major components associated with the power island (steam generator, steam turbine generator, transformer, and switch gear) are based on conventional power generation technology. SolarReserve plan to competitively bid the balance of plant as well as the engineering-procurement-construction (EPC) services to assure competitive pricing. Table 3 below provides a list of the major equipment providers.

Table 3 – List of Major Manufacturers

COMPONENT	IN-HOUSE / SUBCONTRACTED	NAME OF SUPPLIER
Molten Salt System		HSR – System Lead
Hot/Cold Salt Storage Tank	Subcontracted	Not yet bid
Piping	Subcontracted	Not yet bid
Salt Pumps	Subcontracted	Friatec Rhinehuette
Receiver Tower	Subcontracted	Not Yet Bid
Receiver	Subcontracted	HSR

Heliostats		PWR – System Lead
Mirrors	Subcontracted	Not yet selected
Motors	Subcontracted	Not yet selected
Tracking Hardware	Subcontracted	PWR
Tracking Software	Subcontracted	PWR
Power Island		
Steam Generator	Subcontracted	GE, Siemens or equivalent
Cooling Tower/ Condenser	Subcontracted	Not Yet Bid
Control Systems	Subcontracted	Not Yet Bid
Balance of Plant	Subcontracted	Various
EPC	Subcontracted	Not Yet Bid

Fuel Supply

Unique from other CSP renewable technologies, the Solar Power Tower does not require combustion of fuel to maintain thermal storage or provide full electric generation during low solar periods. The thermodynamic properties of the molten salt, combined with proper insulation of the molten salt storage tanks eliminate the need for fossil fuel based heating source. For extended periods of plant downtime, supplemental electric heaters supplied by lower cost off-peak electric energy will be provided.

Metering

At the current stage of development and design, specific metering requirements have not been specified. SolarReserve contemplates meeting all metering and telemetry equipment as stipulated by the owners of the nearest substation or other designated transmission system operator. It is further contemplated that the Project will incorporate appropriate metering and telemetry as reasonably required by power purchasers.

Heat Rates and Level of Efficiency

Given that the Project will not consume fuel, the concept of heat rate is not directly applicable. With enhanced receiver technology, heliostats, and heliostat control systems and other proprietary third generation advancements, the bidders are confident in improving many of those efficiency factors throughout the system.

Capacity Rating

The Project's ability to generate quantities of energy (MWh) is limited primarily by solar irradiance and weather conditions. The hours of firm capacity availability will be limited by the number of hours of stored energy that are drawn down and the maximum rating of the steam turbine generators. Variations in firm capacity are expected to be minimal and limited primarily by steam turbine design conditions, with performance limited primarily to ambient conditions and relative humidity.

The following is a summary of indicative performance based on expected summer design conditions for a typical June at the Project site:

- June Solar Irradiance 287.2 kWh/m^2/mo
- Net Electric Generation 1805 MWh/day
- Gross Electric Energy Storage up to 2000 MWh
- Maximum Net Generation Capacity (PMax) 120 MW
- Maximum Dispatch Time at PMax 15 hours

The above dispatch hours could be higher if capacity (MW) dispatched is lower and if thermal energy is stored and not used during certain days (e.g., off-peak Sundays or Holidays).

Communication, Control, and Instrumentation

SolarReserve contemplates that the Project will be staffed 24 hours per day, with operational control and data management provided by a distributed control system (DCS). The DCS will include instrumentation to measure a wide range of operating data, including but not limited to:

SOLAR

- Irradiance
- Wind speed
- Ambient temperature (wet and dry bulb)
- Molten salt temperature in the receiving tower
- Molten salt temperature in the high temperature tank and low temperature tank
- Steam generator conditions (temperature, pressure)
- Feed water conditions

SOLAR ISLAND

- Collector field and individual heliostat operational status
- Calculated flux on the receiver
- Receiver panel temperatures
- Inlet tank level and pressure
- Hot and cold salt temperatures and flow rates
- Hot and cold salt pump operational parameters
- Hot and cold thermal storage tank levels and temperatures
- Steam generator flows and temperatures for both salt and water-steam sides for all vessels

TURBINE GENERATOR ISLAND

- Main Steam and Reheat temperatures and flow rates
- Condenser Vacuum
- Circulating water temperatures and flow rates
- Condensate conditions (temperature) and flow rates
- Gross steam turbine generation (MW)
- Net steam turbine generation (MW)

- Voltage, current, frequency, and reactive power

Specific design and specifications for control systems, data management, and telecommunication will be specified in the detailed design phase of Project development. SolarReserve will coordinate with the Utility regarding the type and level of data communication they may request.

Ancillary Services

Storage of high temperature molten salt provides the facility with significant thermal inertia to deliver "quick-start" capability and responsiveness to system fluctuations. The ability to store renewable energy harvested from the sun results in a fully dispatchable generation resource that can provide a wide range of ancillary services including:

- Regulation and Frequency Response
- Energy Imbalance
- Operating Reserves - Spinning
- Operating Reserves - Supplemental
- Generation Imbalance
- Reactive Power Support
- Black Start Capability (option)

The steam turbine can be capable of incorporating Automatic Generator Control (AGC) to allow dynamic load following regulation capability. Detailed designs and specification for the steam turbine and generator have not been defined for this specific Project at the date of this application. However, we anticipate that our firm capacity resource will be capable of providing the similar operating characteristic as conventional steam plants. Based on operating experience at Solar Two and improvements in thermal storage technology, SolarReserve anticipates that stored molten salt will maintain its temperature to allow the electric generation to be turned down or curtailed for days with the ability to respond rapidly to dispatch calls.

SolarReserve believes that the provision of firm capacity and ancillary services is unique for this specific renewable resource. SolarReserve may price these services separately as adders to the base RPS energy pricing. During the summer period, the Project will have the average capacity to generate and store the equivalent of approximately 2,000 MWh of electricity per day. With the molten salt storage, the Utility can have dispatched generation as it pleases; day or night, rain or shine, weekday or weekend. Such dispatchability cannot be found with wind, with traditional PV, or even with other CSP technologies. This thermal storage capability, brings a solar paradigm shift with renewable power and enables a number of competitive scenarios for utilities: 1) a renewable baseload plant dispatching power consistently throughout the day (Figure 4); 2) collecting solar energy during Sunday and shifting power generation to Monday, a period of higher demand (Figure 5); or 3) renewable peaker plant enabling power generation to be shifted to the period of peak demand within a single day (Figure 6). With proper Solar

Power Tower design, the Project plant would provide the Utility with the capability to pursue all three of these scenarios to better meet market needs and maximize returns. This ability to collect solar energy, store it efficiently, and dispatch it at will make the Project unique among all renewable options.

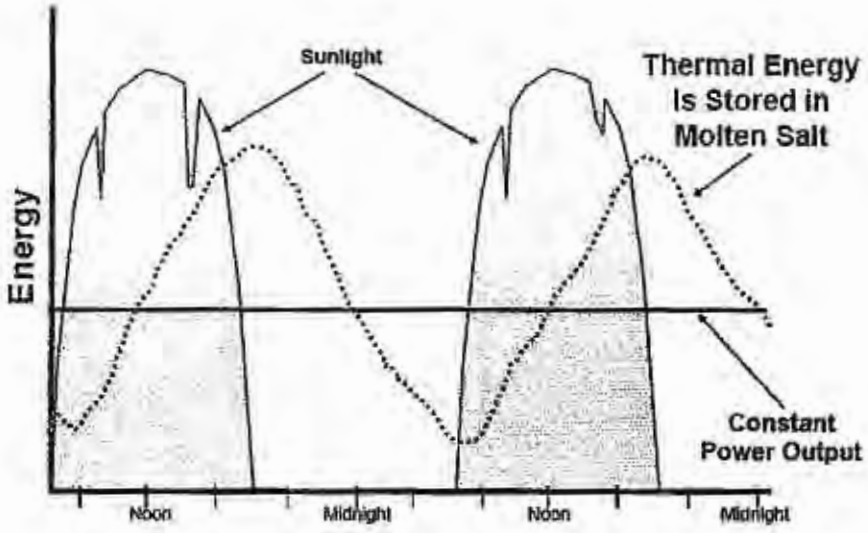


Figure 4 – Scenario 1, Renewable Baseload Plant

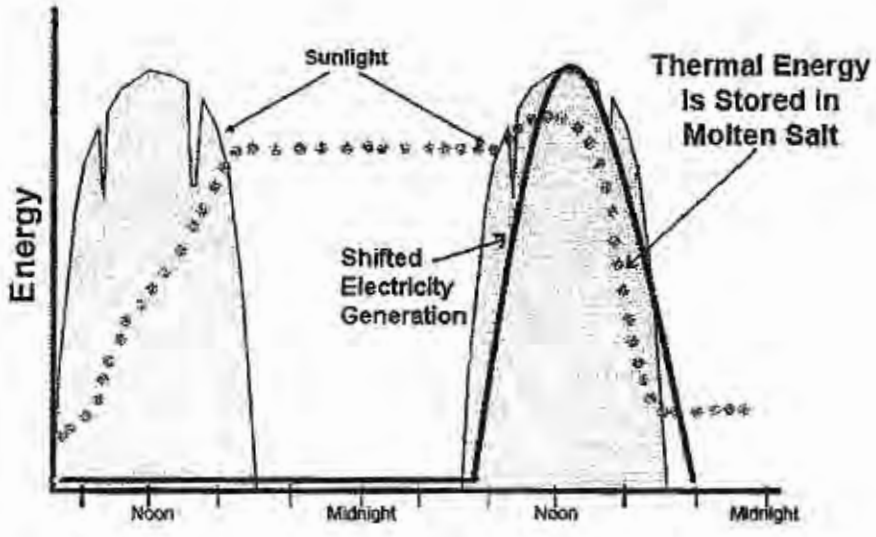


Figure 5 – Scenario 2, Shifting Renewable Power from Weekend to Weekday

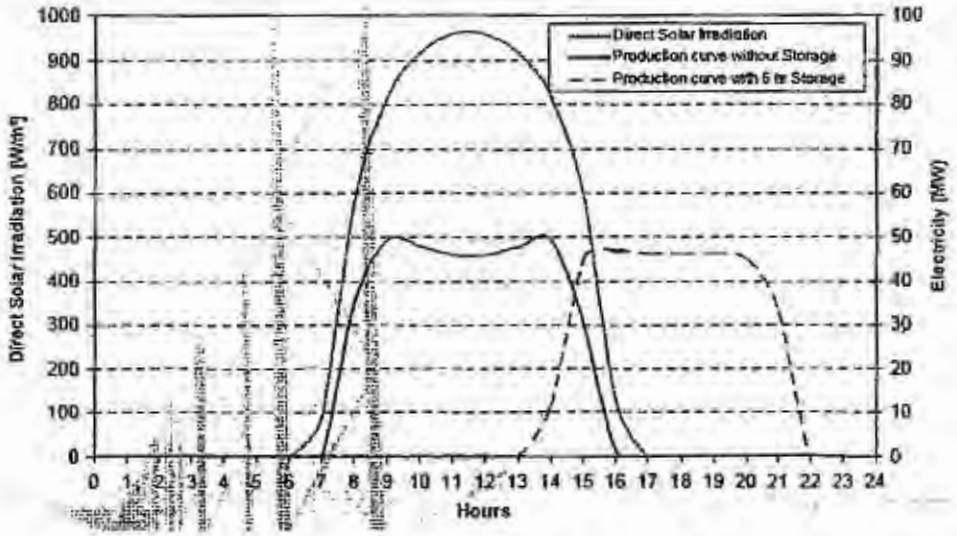


Figure 6 – Scenario 3, Shifting Renewable Power Generation to Match Peak Demand

Facility Limitations Which Could Affect Performance and Availability

Heat loss: The facility is explicitly designed to have maximum thermal energy storage with minimal loss. The molten salt storage tanks have two to three feet of insulation on that will preserve the thermal energy for months if necessary. Tank losses at Solar Two were measured at less than two percent per month. To minimize thermal loss or for longer outage periods, electric heaters in molten salt tanks can be utilized during off-peak (low cost) periods.

Wind loading: Due to the size of the heliostats, when winds exceed 35 miles per hour the mirrors must be moved into a store position. However, during the intermittent times that the heliostats are in a store position, the Project will have the ability to generate steam and electricity derived from stored thermal energy. With more than 2,000 MWh of energy storage potential wind loading on heliostats in this location is expected to have limited impact on the ability of the dispatch the facility to dispatch electricity.

Weather: Similar to wind, cloud cover can be a factor in the in the production of thermal energy. The actual impact on plant performance is dependent on the final thermal storage capacity and actual hours of power generation needs (e.g., peak vs. baseload) dispatch. Typically, periods of inclement weather that might impact thermal production rarely last more than two days.

Maintenance: Maintenance can occasionally play a factor in limiting the dispatch of electricity. Please see the "Description of Frequency and Duration of Scheduled Maintenance" section for anticipated overhaul periods.

Typical Day Hourly Profile for Non-Dispatchable Resources

The Project will be an extremely-dispatchable firm resource which will be expected to provide a fixed quantity of MWh at a range of MW capacities during dispatched hours. The thermal production profile correlates closely with solar irradiance data.

Anticipated Volatility in Power Flows

The harvesting of solar energy thermal production is a separate operating process from the power generation cycle. As such, Project offers a firm capacity resource with smooth operational characteristics to accommodate Utility and grid operator system needs. Thermal storage provides significant inertia to manage volatilities associated with power generation.

Proposed Construction Period

May 2010	Financial closure
May 2010	Begin procurement of long-lead equipment (steam turbine-generator - 20-24 months lead time, main unit transformers and switchgear - 20-24 months, hot and cold salt pumps - 18 months)
	EPCM contractor accelerates detailed design work.
Sep. 2010	Commence job site preparation (clear, grub, grade, survey, and fence)
Oct. 2010	Heliostat field fabrication and installation commences (on site)
	Begin excavation for the tower
Nov. 2010	Salt tank construction begins
Aug. 2011	Steam turbine generator, circ water, switch yard installation commences
Sep. 2011	Central receiver installation starts
Nov. 2011	Distributed systems installation starts
Jun. 2012	Start-up testing of equipment commences
Oct. 2012	Equipment installation complete
Jan. 2013	Commercial operation

Project Management

SolarReserve brings experienced project management skills in order to execute the Project. The management team has executed well in excess of 5,000 MW of power projects including natural gas fired projects, solid fuel projects, wind energy projects and other alternate fuel projects. This experience includes all development, construction, financing and operational aspect of the Project. The tasks associated with the execution of the project include:

- Land related issues and local approvals
- Environmental Permitting
- FAA approvals
- Water supply
- Public outreach and communications
- Interconnection activities
- Equipment supply and evaluation
- Balance of plant systems and design
- EPC contractor assessment and selection
- Transportation
- Financing related activities
- Construction management
- Operations and asset management

Quality Assurance

The development team at SolarReserve has extensive experience in the development, construction, and operation of utility scale power generation facilities. SolarReserve will bring in qualified contractors for equipment supply and construction. Those contractors will be required to submit Quality Assurance plans at the time of selection. The equipment supplier for the molten salt loop will be United Technologies Corporation subsidiary Hamilton Sundstrand Rocketdyne (HSR). HSR is a highly qualified equipment supplier and contractor qualified to perform work for the aerospace industry, US Department of Defense, and NASA and has fully proven quality assurance programs.

Performance Guarantees and Warranties

Under a Power Purchase Agreement, the Project will provide the Utility with market based performance guarantees which would include the following:

- Plant Output – The Project will guaranty a specific net plant electrical output, and be liable for associated liquidated damages for failure to satisfy such guaranty subject to an agreeable limit of liability.
- Plant Availability – The Project will guaranty a specific plant availability value, excluding availability due to weather related issues, and be liable for associated liquidated damages for failure to satisfy such guaranty subject to an agreeable limit of liability.

With respect to the guarantees provided by United Technologies Corp. to Project, the license agreement between Hamilton Sundstrand Rocketdyne (HSR) and SolarReserve provides for warrantees and guarantees on the molten salt loop. The steam turbine supplier will provide similar guarantees on equipment provided.

Start-up Testing

Upon completion of construction of the Project, the facility will begin a start-up testing phase that would be somewhat similar to that of a conventional fired power plant. The start-up

testing phase and many of the startup procedures were co-developed and perfected by Bechtel and Rocketdyne through their experience with Solar Two.

Factory and Performance Tests

The most critical components of the Project will be manufactured in-house and under the direct supervision of UTC or one of its subsidiaries or subcontractors. Such scrutiny will allow UTC to provide the comprehensive performance wrap under which Project will operate.

Many components, due to their size will have to be tested at the Project site. This is the case for the central receiver. Made up of 16 separate panels the flux requirement for just one of those panels exceeds the capacity of the National Solar Test Facility at Sandia. However, smaller versions of the panel have been tested at Sandia and at Solar Two. These smaller versions used the same metallurgy, the same flow rates, and the same tube crown temperatures as designed for Project. Additionally these scaled tests occurred at levels that far exceed the flux levels than Project will ever experience.

A factory performance test will be performed for both the hot and the cold salt pump to verify vibration free motion under load and at elevated temperatures.

A factory performance test will also be performed for the heliostat designed for this plant. This test will confirm design predictions for pointing accuracy, image shape and size and structural deflection under load.

Due to the quality of the Rankine cycle equipment that will be delivered by an industry leader in steam generation cycles (most likely GE or Siemens), much of the performance testing will be done at the site. Performance outputs from the steam cycle will be well known and the performance of those systems and components will be guaranteed by the manufacturers.

Start-up Times and Load Ramping Rates

Start up times for the Project are dependent on the thermal storage already accrued and the temperature of the equipment to be run. Standard operating procedures require operators to leave sufficient salt in the hot tank to enable a couple of hours of generation time so that demand could be met rapidly. In cases where the Project has stored thermal energy, the turbine is at temperature, the condenser has vacuum, and the condensate chemistry is within specification, it would be able to reach full generating capacity online in ten minutes.

Though very unlikely, if the Project were to have no thermal storage in its tank, the start up times depend upon the solar resource at the time. Assuming an average day in June, with an average 8.9kWh/m2/day, the Project would be able to start up from a "cold start" and produce electricity at full capacity in 60 minutes.

The following are start times to achieve zero load synchronous and ramp rates for the Project if the plant were shut down for several days or even several weeks. This is due to the lack of thermal energy loss from the storage tanks (less than 2 percent per month). The key issue is

avoiding thermal shock by observing manufacturers' thermal ramp rate specifications. But once the turbine is at temperature, and the steam drum is full, synchronizing to the grid and adding load is similar to any coal fired plant.

Other pertinent load related information:

Minimum Load:	Turbine Turn down to 20% is typical
Ramp Rate from 0 MW to 100% full load:	10% of rated capacity per minute is typical
Ramp Rate from 100% full load to no load:	In a trip, the turbine sheds load in seconds.

Performance degradation (capacity reduction or performance impacts) is not expected to any significantly measurable extent. Observance of predictive maintenance requirements will maintain the solar island at near new conditions for the life of the plant.

Design Life Loading (Wind, Seismic, etc.)

The most significant loading criteria for a solar plant that shuts down for part of each day is thermal cycling. This plant is designed to withstand 30,000 full range thermal cycles with zero deleterious effects, which corresponds to a design life significantly greater than a 30 years.

Description of Pre-Operational Milestones

Land Agreements: SolarReserve will file an Application for Transportation and Utility Systems and Facilities on Federal Lands (Standard Form 299) with the Bureau of Land Management (BLM) to obtain right of way necessary for use of BLM lands associated with the proposed Project.

Permitting: The necessary local, state, and federal permits will be obtained.

Interconnection: An interconnection agreement will be negotiated and obtained. This will include the construction of any facilities to connect with NV Energy's network at Anaconda substation.

Water Supply Agreements: SolarReserve anticipates being able to purchase water from Nye County / Town of Tonopah, or to draw water from subterranean wells. All water rights agreements will be negotiated signed and executed.

EPC Agreement: All contractors and subcontractors will be selected and compensation negotiated.

Procurement of Long Lead Equipment: Orders are issues for plant equipment with the longest lead times (steam turbine-generator, main unit transformers and switchgear, hot and cold salt pumps)

Power Contract: SolarReserve, the Utility, and possibly other investor owned utilities complete negotiation, agree upon pricing, payments and other contractual terms.

Heliostat field fabrication: Finally assembly of heliostats commences on site in preparation for installation.

Salt tank construction: Start of installation of molten salt tanks.

Central receiver install: Commence installation of the central receiver on the tower.

Equipment installation complete: All Plant construction complete, checkout of plant operation can commence.

Close Financing: Final terms for all debt, equity and tax equity contracts will be negotiated and agreed upon by all parties.

Commissioning/Start-up: Project will start to generate electricity.

Testing: All prudent testing and preoperational procedures will be finalized.

Commercial Operation: anticipated to be early 2013, dependent upon development of the interconnection line.

Description of Frequency and Duration of Scheduled Maintenance

The maintenance plan addresses three distinct areas:

- The collector field,
- The molten salt loop, and
- The balance of plant (turbine generator island, cooling system and auxiliaries).

<u>Collector Field</u>

The maintenance of the solar collector field will be the most labor intensive of the O&M operations at the Project. The 127 m^2 mirrored surfaces of the heliostats will have to be washed on a regular basis so to maintain the mirror's highly efficient reflectivity. At the Project, wash trucks each with a single operator will continually move through the field washing heliostats.

In order to wash the heliostats, the plant operators would take a row of approximately sixteen heliostats off of the receiver at a time and place them into a vertical "wash" position. The wash technician would drive a large wash truck, analogous to water trucks used on construction sites for dust suppression, up to the individual heliostat. The truck would be outfitted with a spray wand which would wash the surface of the mirror. Once the technician has washed that

particular string, they would call to the operator and the freshly washed mirrors would return to a "track" position to concentrate the sun's energy on the receiver, and bring another set of receivers in to "wash" position. Similar to painting a very large bridge, by the time the two operators have finished washing the entire solar field it is time to start over again.

The only other major maintenance that would be expected in the solar field would be the occasional, but rare, replacement of a heliostat drive motor. The replacement of the motors would be performed by an onsite operations and maintenance crew. It would take approximately two to four hours to replace a heliostat motor. Heliostat facets will seldom have to be replaced.

Molten Salt Loop

The molten salt loop will require far less normally scheduled maintenance than the heliostat field. The receiver, tanks and thermal exchangers contain few moving parts. The only components of the molten salt loop that have significant moving parts are the valves and pumps. Valve replacement is infrequent and can usually be replaced overnight. In the molten salt loop only the pumps have planned maintenance. The life of the radial bearings on these long shafted pumps averages 5 to 6 years, and the thrust bearing at the top of the pump shaft can be replaced in position.

The central receiver panels will be repainted in place approximately every two years in order to maintain their high absorbtivity. This maintenance is performed when the plant is shut down for scheduled turbine maintenance and will require about two weeks to complete. The maintenance requirements for the molten salt thermal storage and delivery system will be defined once the pump configuration and design is final and will be specified by HSR.

Turbine Generator Island and Steam Loop

The nature and schedule for the maintenance of the turbine generator island and steam loop are very similar to the requirements of these same components on a similarly sized natural gas or coal fired plant. The scheduled maintenance activities for the steam cycle will be driven by major maintenance intervals for the steam turbine. SolarReserve conservatively estimates that for this cycling facility, a major overhaul/inspection will be required every six years resulting in a two to three week outage. Minor steam turbine inspections will be required about every three years resulting in a one to two week outage. These outages will be coordinated with the maintenance activities for the solar portion of the facility, as well as with the preferred schedule of the Utility.

Duration

The design of the plant provides for a 100% spare for the hot and cold pumps to minimize plant down time. The spare pump is contained in the salt tank so that it is at temperature and the slow heat up needed to avoid thermal shock is eliminated.

Rocketdyne found through its experience at Solar One and Solar Two that most maintenance can be performed after the sun goes down and many tasks can be completed during a single

shift. Through those experiences with the demonstration plants, Rocketdyne also found it prudent to schedule a two week shut down every two years during the winter months, when the demand is lowest, for larger maintenance issues.

Other Maintenance Notables

Similar to sizing Project beyond Solar Two, it is only scale, not the nature of the maintenance that is significantly different. In having experienced 17 years of heliostat maintenance and more than three years of molten salt loop power generation, the expertise of Rocketdyne and SolarReserve sets this Project far ahead of other companies that are just starting their solar tower programs.

Since the decommissioning of Solar Two, many advancements have been made by the owners of the technology. Both Hamilton Sundstrand and Pratt & Whitney Rocketdyne have made significant advancements in the quality of materials and design that will help the Project be among the most cost competitive solar resource electricity generators in the industry.

The Project will be a strong and constant provider of both low skill and high skill jobs to Tonopah 3 Solar Energy for the years to come. Beside the temporary construction jobs leading operation, it is estimated that the Project will provide 24 full time, low skill jobs; 16 full time, high skill jobs; and two office/ancillary jobs for the El Centro area while in operation.

Operation and Maintenance

SolarReserve intends to establish independent operators with experience in operating and maintaining power facilities to operate and maintain the plant following the achievement of commercial operation and to have its operation and maintenance personnel trained by HSR and PWR with respect to the operation and maintenance of the solar portion of the facility. SolarReserve does not expect to select an operator until construction of the plant has commenced. Plant personnel will begin being brought on-board commencing 12 months prior to the scheduled start of commercial operations (up to the total numbers included in the O&M Plan).

O&M Plan Purpose

This plan provides the overview for the operations and maintenance of the Project for the first twelve (12) months of commercial operation. This plan provides basic assumptions and discussion of operations and maintenance areas and gives a short overview of the other programs used to meet the Owner and Operator objectives.

The Operating Budget provides monthly details for:

- Operations, repairs, and expected improvements.
- Routine maintenance.
- Expected purchases (including capital expenditures and equipment acquisitions).
- Personnel plan.
- Administrative and support activities taken in support of the plant.

- Additional related aspects.

Plant Operations

We assume that the plant will commence commercial operations in early 2013. The plant is assumed to operate at full load, in accordance with the allowable dispatch instructions from the Utility. The Operations staff at the plant consists of:

Operators	10
Solar Field Technicians	24
Water Technicians	2
Shutdown Technicians	6

The operations crews will work rotating, 12-hour shifts. Vacation and sick day coverage, training, or absences for any other reasons will be provided by off-shift operators/technicians, and qualified maintenance personnel, as required. On-going training will be provided to maintain operator qualification and certification.

The plant's performance monitoring system and processes will be updated as required to reflect initial plant operating data to best determine plant operational efficiency and cost effectiveness, including:

- Capacity
- Energy Generation
- Receiver and steam turbine performance
- Plant makeup water requirements
- Solar Heat Collected
- Molten Salt Temperatures

Mock emergency exercises will be conducted periodically in cooperation with the local fire and police departments in order to test Emergency Response Plan preparedness and to drill the plant employees in the proper execution of emergency roles and tasks.

Plant Maintenance

The Maintenance Program is conducted in accordance with the Maintenance Manual, vendor technical manuals, and good engineering practices. Subject to scheduled overhauls, the nominal design life for the major components of the plant is 30 years. This program consists of:

- Routine Preventive Maintenance (including "Operator checks") – normally conducted by the plant O&M staff, supported by outside contractors as required for some aspects of the predictive maintenance program (e.g., oil analyses).

- Corrective Maintenance – normally conducted by the plant O&M staff, supported as necessary by outside contractors as required due to special equipment or expertise

which is not cost-effective to maintain current on site (e.g., "code" welding) or to augment efforts to return the plant to operation as soon as possible following a forced or unscheduled outage.

The solar plant will be covered by a warranty from the respective suppliers. All warranties will be tracked and compiled with and warranty claims will be made as directed by the Owner's Representative.

The Operator will utilize a Computerized Maintenance Management Software (CMMS) package, vendor and contractor recommendations, and good engineering practices to plan and implement the component preventive maintenance program.

Scheduled Maintenance periods will be planned and coordinated with the utility in accordance with the PPA. There are no planned major equipment outages other than steam turbine inspections. Solar tower certification and other maintenance, including solar receiver inspection, which requires the plant to be shutdown, will be accomplished at the same time as the steam turbine inspections. Unscheduled corrective maintenance will be decided on a case by case basis. A projected outage maintenance schedule will be submitted separately.

Other maintenance that will be performed in conjunction with the shutdown of the plant for combustion inspections include but is not limited to:

- Check and adjust safety valve settings
- Torque electrical fittings
- Clean switch gear
- Calibrate protective relays
- Repair, seal and preserve cooling towers
- Fire protection system test and annual certification
- Inspect/Test the steam turbine generator and associated components
- Inspect solar receiver internals and externals
- Annual steam turbine/surface condenser inspections

The Operator will contract specific maintenance tasks or will perform them by the plant staff as appropriate and most cost-effective manner.

Periodic water washes of the mirrors to maintain efficiency at the expected levels will be conducted.

Agreements will be established with local machine shops, equipment suppliers and spare parts vendors to ensure that services and equipment are available on short notice to minimize any unit downtime. Maintenance Service agreements are anticipated on the following areas, as appropriate:

- Predictive maintenance testing and analysis
- Safety valve setting, calibration and maintenance
- Crane testing and certification
- Testing and certification of fire protection system(s)
- Heating, ventilating and air conditioning (HVAC) maintenance and repair
- Laboratory services, such as:
  - fuel, wastewater, and air emissions testing and analysis (detailed analysis only)
  - influent water analysis (detailed analysis only)
  - groundwater sampling and analysis
  - lubricating oil sampling and analysis
  - demineralization resin performance testing
- Calibration services (beyond the cost-effectiveness of the plant's capability), such as:
  - high voltage protective relay calibration
  - safety relief valve calibration
  - electricity, fuel, and water flow metering calibration
  - laboratory analysis equipment calibration
- Environmental engineering services
- Consulting engineering services
- Machine shop services
- Boiler non-destructive testing inspection
- Plant security services
- Fire protection services
- Plant janitorial services
- Trash and waste material disposal (including potentially hazardous waste)
- Individual office equipment, such as fax, copies, computers, etc.
- Employee transportation (as required)

The Maintenance staff consists of:

Mechanical Technicians	4
Electrical/Instrumentation Technicians	4

The Maintenance staff will work a normal work week. Selected maintenance staff will be on-call on a 24-hour basis. Adequate spare parts supplies will be maintained, and ordered at the appropriate times, to support preventive maintenance and probable corrective maintenance requirements. A warehouse area will be maintained for the receipt and storage of plant spare parts and material.

Staffing

Management personnel will provide technical oversight/guidance in four critical areas: overall plant management (by the "Plant Manager"), plant operations and maintenance (by the "Operations Manager"), and human resources, accounting, and administration (by the "Administrative Assistants"). No replacement/rotations of plant personnel are projected during this period. If the need for such a rotation arises, necessary arrangements will be coordinated with the Owner on a case-by-case basis. As appropriate, O&M personnel will be provided uniforms and proper foot wear.

Handling & Disposal of Hazardous and Non-hazardous Waste

Once construction is complete, the Project will have minimal hazardous and non-hazardous waste located onsite. The molten salt is a combination of Sodium Nitrate ($NaNO_3$) and Potassium Nitrate (KNO_3) in a ratio of 60 percent $NaNO_3$ to 40 percent KNO_3. In their solid form, these two salts are traditionally used as elements in garden fertilizer. Because the salts are only used as a thermal working fluid and are not consumed, they are used continuously for the life of the plant without the need for re-processing. Occasional spills of small quantities of salt from a leaking gasket will quickly freeze and will be picked up by plant staff and placed into a waste receptacle. Depending upon the rules of the local jurisdiction, this salt can be reused/recycled or disposed of in a landfill. For example, at the end of the Solar Two demonstration period, the salt was solidified onsite and sold for fertilizer.

In addition to small quantities of salt which may leak, the turbine plant drains flow to an oily waste separator common to many steam plants and the waste is then removed by vacuum truck to a qualified facility. This fluid may contain lubricants and oils common to the turbine generator island. The quantity of this waste should be no different than for a similar steam unit of comparable size.

Control and Monitoring of Air Emissions and Noise Control

The plant has no emissions to the atmosphere other than condenser sparger effluent and steam relief valve discharge from the turbine generator island.

Air Quality (NOx, SOx, CO, VOC, & PM10)

There is neither combustion nor chemical reaction to produce emissions such as NOx, SOx, CO, VOC, and PM10.

Water Use, Maximum Daily Discharge

The proposed station is designed with a cooling tower for steam cycle cooling. This facility will require water for cooling tower make-up, make-up of condensate due to normal relief valve losses and minor spills, and water to wash the heliostats.

Cooling tower makeup requires the largest water usage at 1,400 acre feet per year. Heliostat washing is a normal, continuous process that occurs every day, with a wash water requirement is less than 200 acre feet per year.

Landfill Use, Maximum Daily Volume
There is no daily volume of waste generated by the cycle. There will be some removal of office waste and broken components from time to time, but these volumes are small.

Project Schedule

Design schedule
Many components have been standardized or can be adapted from previous standard models with little change. This is true of the turbine generator, the dry cooling equipment, the salt tanks, and pumps. SolarReserve has established standard designs that permit accelerated customization of the solar receiver design features to match the local solar radiation. Using these existing designs, the extrapolation can complete within four months of notice to proceed and the fabrication can commence.

Manufacture schedule
The longest lead time components in this plant appear to be the turbine generator island and the main transformers and switchgear. Depending upon the manufacturer, these deliveries can take as long as two years. The solar receiver and molten salt pumps can be delivered in about one year from the receipt of order and the other components are more readily available. Therefore, the first component to place on order is usually the turbine generator.

The collector field, by virtue of the large population of components is another challenge. Since their size precludes shipping, the heliostat components are shipped to the site and then assembled in a building erected for that purpose. This manufacturing commences very early in the construction process and proceeds for at least a full year.

Financial Capability

SolarReserve's Financial Capability
SolarReserve, LLC, a Delaware limited liability company, is owned by US Renewables, LLC ("USRG"), a $575 million private equity firm located in Santa Monica, California. The SolarReserve management has extensive experience in the development and financing of utility-scale power generation facilities having developed and financed more than $4.5 billion in power facilities.

Based on the finance plan developed for the proposed Project by USRG, it is expected that USRG will provide a significant portion of the "non-tax" equity required for the project from its own funds. The balance of the required "non-tax" equity will be secured from a strategic investor interested in solar thermal power projects, one or more equity investors interested in renewable energy project or the limited partners in USRG that have parallel investment rights. The tax equity required for the Project (essentially, an investor interested in securing investment tax credits and depreciation deductions from the project to offset its other tax

liability, but is not interested in taking the balance of the risks of owning and operating a solar thermal power project) will be secured from a third party with a significant tax appetite. USRG, like most private equity funds, is not able to utilize the tax benefits of a project.

United Technologies Corporation's Financial Capability

UTC, with a market capitalization of almost $70 billion, is the parent company to HSR and PWR which will be providing performance guarantees for the molten salt system and heliostats respectively. UTC's most recent credit ratings are provided in Table 4 below.

Table 9 – UTC Credit Ratings

Agency	Long-term rating	Short-term rating	Date
Moody's	A	A-1	2006
Standard & Poor's	A2	P-1	2006

Long-Term Rating System:

Each rating agency uses its own long-term rating scales which have about 10 or so grades. Long-term rating covers debts of over one year.

- Moody's: This agency uses a rating made up of upper and lower-case letters. From the most to the least favorable, the scale is as follows: Aaa, Aa, A, Baa, Ba, B, Caa, Ca, C. The rating is refined by a figure from 1 to 3, which indicates the company's position within a category.
- Standard & Poor's and Fitch: These agencies use a rating scale in upper case letters. From the most to the least favourable: AAA, AA, A, BBB, BB, B, CCC, CC, C, D. The rating is refined by a + or -, according to whether the company is located in the higher or lower end of a given category.

Agencies include a "prospect" with each rating: this is the agency's opinion of the evolution in the quality of the company's credit. These prospects are positive (increase), stable or unstable (decrease).

Short-Term Rating System:

Short-term rating scales of the three agencies comprise between 5 and 7 grades. Short-term rating covers debts of less than one year.

- Moody's: Ratings go from P-1 (Prime-1), the most favorable rating, to Not Prime, the least favorable.
- Standard & Poor's: The scale is as follows: A-1+, A-1, A-2, A-3, B, C, and D.
- Fitch : The rating scale is as follows: F1, F2, F3, B, C, and D.

Specific events can affect the quality of a company's credit. Agencies then have the possibility of "monitoring" ratings, with a "positive" or "negative" prospect. This can lead the agencies to confirm, raise or lower their rating.

Description of Financing for the Project

The total cost of the Project is estimated to be $684 million and SolarReserve expects to finance the Project using both cash equity as well as a tax partner to monetize the investment tax credits. The initial expectation is that the SolarReserve team will arrange for construction

financing as well as a tax equity partner at the time of commercial operation. The SolarReserve team will be the long term cash equity investors in the Project.

Financial Guarantees

United Technologies Corporation, with $55 billion in sales in 2007, is the parent company to HSR and PWR which will be providing performance guarantees for the molten salt system and heliostats respectively.

Capability and Experience of SolarReserve

About SolarReserve's Investors

- Citi – Sustainable Development Investments (SDI) - a private equity group within Citi that seeks investment in renewable energy. Citi has announced plans to direct $50 billion in the next 10 years to address global climate change.
- Good Energies – a leading global investor in renewable energy and energy efficiency industries. Good Energies' annual investment budget is $450 million and its current portfolio has a market capitalization of more than $5 billion.
- US Renewables Group – the founding investor in SolarReserve and one of the largest US private equity firms focused exclusively on investing in renewable power, biofuels, and clean technology infrastructure and has mobilized $575 million of capital commitments.
- Credit Suisse Customized Fund Investment Group ("CFIG") – one of the world's leading managers of private equity fund-of-fund and co-investment programs, with nearly $22 billion of commitments to more than 750 private equity funds and portfolio companies.
- Argonaut Private Equity – a diversified global private equity fund dedicated to building emerging market leaders with more than $3.5 billion under management.
- PCG Clean Energy and Technology Fund - dedicated to investing across the spectrum of the global clean energy market. The fund is managed within PCG Asset Management, which annually oversees more than $9 billion of private equity commitments.
- Nimes Capital, LLC – a member of Nazarian Enterprises. Nimes Capital is a private equity fund that provides growth capital to development companies with an emphasis on renewable energy, water and wastewater management and clean technologies.

SolarReserve's Development Team

<u>Terry Murphy – President & Chief Executive Officer</u>

Mr. Murphy joined SolarReserve following a twenty-seven year career at Rocketdyne, where two United Technologies Companies, Pratt & Whitney and Hamilton Sundstrand, co-exist and share operational resources. His organization was responsible for the development of advanced power systems; with recognized expertise in the systems engineering of space power systems,

concentrated solar power, liquid metal heat transport and nuclear power systems. Rocketdyne designed, developed and performed the system integration of the International Space Station power system and is developing radioisotope thermoelectric generators to support NASA planetary explorations. As the Director of Advanced Engine Programs, he formulated the design of booster engine for the Boeing Delta IV launch vehicle and initiated several international teaming agreements for upper stage engines. Mr. Murphy was also the Director of Boeing Energy Systems, prior to the acquisition of Rocketdyne by United Technologies, and solidified programs in improving the reliability of transition ducts on gas turbines, improving the performance on coal gasification and developing a new method for hydrogen production.

Mr. Murphy earned a BS in Astronautical and Aeronautical Engineering from Purdue University and was honored in 2005 with their Outstanding Engineering Award; he also earned a MS in Systems Management from the University of Southern California.

Kevin Smith – Chief Operating Officer & Head of Development

In the last twenty years, Mr. Smith has actively managed the successful development, acquisition, financing and construction of more than forty power facilities in the US and internationally with total capital costs of more than $4.5 billion and long-term power sales contracts approaching $50 billion. This includes wind energy, natural gas, oil, and biomass-fired electricity generating facilities located in the United States and more than a dozen countries around the world. Prior to joining SolarReserve, Mr. Smith was Senior Vice President of Development at Invenergy, LLC. While there, he led the development of Invenergy Wind from a startup company in 2004 to one of the largest privately-owned renewable energy businesses in the world just three years later. By the end of 2007, Invenergy had projects in operation and construction with capital costs estimated at more than $2.0 billion.

Prior to Invenergy, Mr. Smith founded and was President of Insight Energy, Inc., was Chief Operating Officer of London-based Rolls-Royce Power Ventures, and was General Manager & Vice President of Indeck Energy. At Rolls-Royce Power Ventures, Mr. Smith led the aggressive growth of this start up group into one of the leaders in the international development of industrial power projects while building an international team and operating projects in ten countries. Mr. Smith earned an MBA in Finance from the University of Chicago, a Bachelor of Science degree in Mechanical Engineering from Purdue University and is a licensed Professional Engineer.

William R. Gould, Jr. – Chief Technical Officer

Mr. Gould brings more than thirty years of technical experience to SolarReserve in the areas of engineering, procurement and construction of power plants and power related systems - with the last twelve years of his career largely dedicated to solar energy installations. Mr. Gould's highly regarded solar energy expertise includes extensive feasibility work, design, construction, cost estimating, and financial due diligence on various concentrating solar thermal power plant technologies including power tower and solar trough designs. This includes facilities in development, construction and in operation in the US as well as installations in Europe, Africa, the Middle East, and Latin America. Prior to joining SolarReserve, Mr. Gould was principal

consultant with Sustainable Energy Projects, LLC with a focus on advising US and international utilities on development of solar tower and trough projects. Prior positions included engineering and project management roles at Bechtel and General Atomic.

One particular area of Mr. Gould's expertise that is of tremendous value to SolarReserve is that he served as Project Manager of the Solar Two project built in 1997 near Barstow California by the US Department of Energy. This highly successful demonstration facility was the largest thermal power tower installation at the time and utilized molten salt technology for energy capture and storage. It is this same technology that SolarReserve is employing in its larger scale facilities today.

Mr. Gould holds Bachelor of Science and Master of Science degrees in Mechanical Engineering from Brigham Young University and is a licensed Professional Engineer in a several states. Mr. Gould has participated in numerous post graduates courses and seminars and has authored a number of technical papers on solar energy.

Thomas P. Georgis, Vice President Development

Mr. Georgis has over twenty years of development and operational experience in the energy, technology, and government service sectors. Prior to joining SolarReserve, Mr. Georgis was Managing Director of International at GlobalTec Solutions, a privately held technology company. Previous positions include Managing Director at Exodus Energy LLC, where he acted as lead developer on several multi million dollar innovative technology energy facilities, and a Development Manager at Enron. Mr. Georgis also served nine years as a Naval Special Warfare Officer (SEAL) in the United States Navy. Mr. Georgis graduated from Northwestern University with a Bachelors of Arts degree in International Studies and obtained a Masters of Business Administration degree from the Anderson School at the University of California Los Angeles.

ATTACHMENT B

13a. Describe other reasonable alternative routes and modes considered.

SolarReserve performed preliminary screening on additional BLM land near Anaconda substation. Additionally, SolarReserve is currently screening potential sites on state and private land, as well as BLM lands in other counties within the region.

13b. Why were these alternatives not selected?

SolarReserve's technology has specific siting requirements. SolarReserve's technology requires a large open space of approximately four square miles, minimal slope, transmission access, water availability, road access, and high solar incidence. SolarReserve is also limited to sites not already claimed by other developers. The selected site is unique in that it enables the development of two SolarReserve projects.

The site selection process for the SolarReserve Tonopah 3 Solar Energy Project involved screening sites based on the following parameters:

- Siting area with minimum area of four square miles and contiguous in configuration
- Solar resource
- Distance from transmission lines and substations
- Land ownership
- Water data
- Topography
- Wind data
- Airport locations
- Highways/roads
- Faults
- Population centers
- Military bases
- BLM SF-299 applications pending
- Various environmental constraints

Based on the above criteria and BLM land available, the Tonopah 3 Solar Energy Project site was identified as the preferred siting location in Nye County. The site is situated on a relatively flat piece of BLM land covering approximately 7,680 acres. The annual average direct normal solar resource estimate surpasses 6.5 kWh/mi^2/day. NV Energy's Anaconda substation is directly adjacent to the east of the site. Additionally, the site does not appear to be located in Areas of Critical Environmental Concern (ACECs).

Other regional sites had the requisite minimum four square miles of contiguous BLM lands but were further away from transmission substations of interest compared to the Tonopah 3 Solar Energy Project site. The selected site affords fewer impacts to BLM land as a result.

13c. Give explanation as to why it is necessary to cross federal lands.

The Project's unique configuration requires a large, flat expanse of land which necessitates crossing federal lands. Locating and acquiring private land in Nye County that is contiguous and expansive enough to meet SolarReserve's requirements would be time and cost prohibitive.

14. List authorizations and pending applications filed for similar projects which may provide information to the authorizing agency. (*Specify number, date, code, or name*)

Arizona, Yuma Field Office
AZA 34665, 34666, 34668

California, Needles Field Office
CACA 49002

California, El Centro Field Office
CACA 49884

Nevada, Tonopah Field Office
NVN 85007

15. Provide Statement for need for project, including the economic feasibility and items such as: (a) cost of proposal (*construction, operation, and maintenance*); (b) estimated cost of next best alternative; and (c) expected public benefits.

(a) The total cost of each Project is estimated to be $700 million. For additional information regarding economic feasibility, please refer to Attachment A.

(b) Costs associated with the next best alternative would be significantly higher compared to the Tonopah 3 Solar Energy Project site. Because the alternative sites are further from transmission, longer and more land intensive transmission facilities would be required.

(c) Nevada's Renewable Portfolio Standard (RPS) program requires electric corporations to increase procurement from eligible renewable energy resources on an increasing percentage basis of their retail sales annually, until they reach 20 percent by 2015. In response to this program, SolarReserve would assist Nevada in repositioning its generation asset portfolio to use more renewable energy in conformance with State Policy. Unlike hydroelectric, geothermal,

biomass, and other renewable energy technologies that use limited renewable fuel sources, SolarReserve's power plants draw their heat from the sun. Unlike wind and photovoltaics, SolarReserve's power plants can deliver power whenever it is needed, either 24 hours per day or only during "peak" demand. By overcoming these two key barriers, SolarReserve enables utility-scale, clean, renewable electricity generation.

16. Describe probable effects on the population in the area, including the social and economic impacts, and the rural lifestyles.

The proposed Project will be located in a generally uninhabited area of Nye County, approximately 10 miles northwest of Tonopah. The principal socioeconomic issue related to construction that would be raised by the Project is housing for any workers that might be relocated temporarily to the area from out of the region. However, it is anticipated that most construction labor will be recruited within a two hour commuting distance from the site. The local area encompasses the communities of Caliente, but Las Vegas is within two hours of the site, and it is assumed that the local area may contain sufficient qualified construction labor to meet the needs of the Project. If a number of specialized workers are required to commute further to complete construction of the Project it is not anticipated to have a significant impact relative to socioeconomics.

The plant will have a total operational staff of 42 employees. The operations crews will be recruited from the local area to the extent possible. A small percentage of operational staff may be recruited from a statewide or national pool. However, the relocation of a small number of specialized workers is not expected to adversely impact population and housing within Nye County. Some positive impacts relative to socioeconomics may include the introduction of 42 permanent jobs to the area, school impact fees, sales taxes on local expenditures, and a source of clean and renewable energy.

The Project will change the historic low intensity land use at the Project site. However, this area is managed by the BLM and there are no residential areas within the BLM lands. Therefore, rural lifestyles are not significantly impacted by the Project.

17. Describe likely environmental effects that the proposed project will have on (a) air quality; (b) visual impact; (c) surface and ground water quality and quantity; (d) the control or structural change on any stream or other body of water; (e) existing noise levels; and (f) the surface of the land, including vegetation, permafrost, soil and soil stability.

(a) Air Quality:

SolarReserve's Solar Power Tower technology is emissions-free. The Solar Power Tower does not require combustion of fuel to maintain thermal storage or provide full electronic generation during low solar periods. The thermodynamic properties of the molten salt, combined with

proper insulation of the molten salt storage tanks eliminate the need for a fossil fuel based heating source. For extended periods of plant downtime, supplemental electric heaters supplied by lower cost off-peak electric energy will be provided. As a result, no adverse air quality impacts are anticipated during operations.

Increased levels of particulate matter can be expected during construction activities such as clearing, grading, and grubbing associated with site preparation; construction of foundations associated with the Solar Power Tower, heliostat field, and ancillary structures; installation of any underground utilities; and creation of access roads, due to soil disturbance. In addition, there will be increased air emissions due to vehicular traffic during site preparation, construction, and on-going maintenance; however, the Project is not anticipated to have a significant impact relative to air quality.

(b) Visual Impact:

Key visual elements of the Project consist of 15,000 heliostats (mirror reflectors) configured around a 640 foot tall Receiver Tower. Two hot salt thermal storage tanks, a solar steam generator and reheater, steam turbine generator, and condenser will also be located within the central "island." The size of the solar field will be approximately 1,500 acres and the heliostats will be arranged in concentric circles divided into four quadrants, surrounding the power tower and main services complex. In addition to the heliostat assembly, power tower, and associated structures, other key visual elements will include temporary construction, administration trailers, and construction equipment.

There are no residences in the immediate vicinity of the Project. Potential sensitive viewers will include recreational users. Other potential sensitive viewers may include travelers along US Highway 95 who may have unimpeded views of the Project due to the flatness of the terrain. Additionally, the Project is located near a transmission line corridor that runs northeast on the east side of the Project boundary.

If constructed, the character of the visual environment will change from one of relatively undeveloped desert to industrial power generation. Although the Project poses a potential for visual impacts, current visual quality is low due to lack of distinctive visual features. Overall visual change is predicted to be moderate. Additionally, viewer sensitivity will be diminished by the low numbers of viewers.

(c) Surface and Ground Water Quality and Quantity:

Based on the current conceptual design, it is anticipated that the steam turbine generator's condenser will be cooled by a dry-cooling system. Water requirements for the Project using a wet cooling tower are expected to be about 200 acre-feet per year.

This Project will require water for cooling water make-up, make-up of condensate due to normal relief valve losses and minor spills, and water to wash the heliostats. Cooling water makeup requires the largest water usage.

Heliostat washing is a normal, continuous process that occurs every day. The 127 m^2 mirrored surfaces of the heliostats will have to be washed on a regular basis so to maintain the mirror's highly efficient reflectivity. At the Project, wash trucks each with a single operator will continually move through the field washing heliostats. In order to wash the heliostats, the plant operators would take a string of approximately sixteen heliostats off of the receiver at a time and place them into a vertical "wash" position. The wash technician would drive a large wash truck, analogous to those used on construction sites for dust suppression, up to the individual heliostat. The truck would be outfitted with a spray wand which would wash the surface of the mirror. Once the technician has washed that particular string, they would call to the operator and the freshly washed mirrors would return to a "track" position to concentrate the sun's energy on the receiver, and bring another set of receivers in to "wash" position. Similar to painting a very large bridge, by the time the two operators have finished washing the entire solar field it is time to start over again.

SolarReserve anticipates being able to draw water required for the Project from subterranean wells. Based on preliminary information, groundwater is available nearby and the Project anticipates no impact to water quality and quantity.

(d) Control or Structural Change on Any Stream or Other Body of Water:

The project would not cause control or structural changes on any stream or other body of water.

(e) Existing Noise Levels:

The facility configuration utilizes a single Solar Power Tower surrounded by a field of heliostats in a two square mile Project footprint (see Attachment A, Figure 2). Although some noise will be generated by pumps and motors associated with the molten salt loop, this arrangement minimizes noise impacts as the primary source of noise is generated by the steam turbine power generation facilities located in the center of the Project site, approximately one mile from the Project's boundary. In addition, because no sensitive noise receptors have been identified within the immediate Project vicinity, no impacts associated with noise are anticipated.

(f) Surface of the land (including vegetation, permafrost, soil, and soil stability):

Preliminary site screening indicates no sensitive species in the immediate vicinity of the Project. Loss of approximately 1,500 acres of habitat that is likely to support various species may potentially occur as a result of this Project. To minimize impacts to habitat, pre-construction

presence/absence and exclusion surveys for both species are recommended prior to implementation of the Project. Mitigation for loss of habitat may also be required and can include purchase of mitigation lands as well as a population monitoring program for habitat of concern.

Permafrost is not present within the proposed Project area. Vegetation will be permanently impacted during construction and operation of the facility; the applicant will work with BLM staff to develop a post-construction re-vegetation plan or other appropriate mitigation efforts to minimize the long-term disturbance of vegetation and wildlife habitat.

The 600-foot Solar Power Tower may create an increased potential to impact migratory birds and raptors. A study of the existing bird populations and migratory routes should be completed before Project construction is initiated, and the Solar Power Tower shall be appropriately sited based on the results of the study. The applicant will work with BLM staff to develop mitigation for the increased risk to migratory birds.

Based on environmental and engineering considerations, the solar field will be situated on approximately 1,500 acres within the approximate 7,680 acres Project boundary. Ground disturbance associated with the initial installation of the Project includes activities such as clearing, grading, and grubbing associated with site preparation; construction of foundations associated with the Solar Power Tower, heliostat field, and ancillary structures; installation of any underground utilities; and creation of access roads.

18. Describe the probable effects that the proposed project will have on (a) populations of fish, plantlife, and marine life, including threatened and endangered species; and (b) marine mammals, including hunting, capturing, collecting, or killing these animals.

(a) populations of fish, plantlife, and marine life, including threatened and endangered species

Because the project site is not located near a body of water, no adverse effects are anticipated on populations of fish, plantlife, or marine life.

(b) marine mammals, including hunting, capturing, collecting, or killing these animals.

No adverse effects on marine mammals are anticipated as a result of this Project. The Project is located more than 200 miles from the coast.

19. State whether any hazardous material, as defined in this paragraph, will be used, produced, transported or stored on or within the right-of-way or any other right-of-way facilities, or used in the construction, operation, maintenance or termination of the right-of-way or any of its facilities. "Hazardous material" means any substance, pollutant or contaminant that is listed as hazardous under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. 9601 et seq., and its regulations. The definition of hazardous substances under CERCLA includes any "hazardous waste" as defined in the Resource Conservation and Recovery Act of 1976 (RCRA), as amended, 42 U.S.C. 9601 et seq., and its regulations. The term hazardous materials also includes any nuclear or byproduct material as defined by the Atomic Energy Act of 1954, as amended, 42 U.S.C. 2011 et seq. The term does not include petroleum, including crude oil or any fraction thereof that is not otherwise specifically listed or designated as a hazardous substance under CERCLA Section 101(14), 42 U.S.C. 9601(14), nor does the term include natural gas.

Hazardous materials will be used during Project construction. The Project anticipates the use of various hazardous materials, including but not limited to gasoline, diesel fuel, motor oil, hydraulic fluid, solvents, cleansers, sealants, welding flux, various lubricants, paint, and paint thinner.

Once construction is complete, the Project will have minimal hazardous and non-hazardous waste located onsite. The molten salt is a combination of Sodium Nitrate ($NaNO_3$) and Potassium Nitrate (KNO_3) in a ratio of 60 percent $NaNo_3$ to 40 percent KNO_3. In their solid form, these two salts are traditionally used as elements in garden fertilizer. Because the salts are only used as a thermal working fluid and are not consumed, they are used continuously for the life of the plant without the need for re-processing. Occasional spills of small quantities of salt from a leaking gasket quickly freeze will be picked up by plant staff and placed into a waste receptacle. Depending upon the rules of the local jurisdiction, this salt can be reused/recycled or disposed of in a landfill. For example, at the end of the Solar Two demonstration period, the salt was solidified onsite and sold for fertilizer.

In addition to small quantities of salt which may leak, the turbine plant drains flow to an oily waste separator common to many steam plants and the waste is then removed by vacuum truck to a qualified facility. This fluid may contain lubricants and oils common to the turbine generator island. The quantity of this waste should be no different than for a similar steam unit of comparable size.

ATTACHMENT 3

Tonopah Solar Energy, LLC
N-85360

WorleyParsons

CRESCENT DUNES
NYE COUNTY, NV
VICINITY MAP

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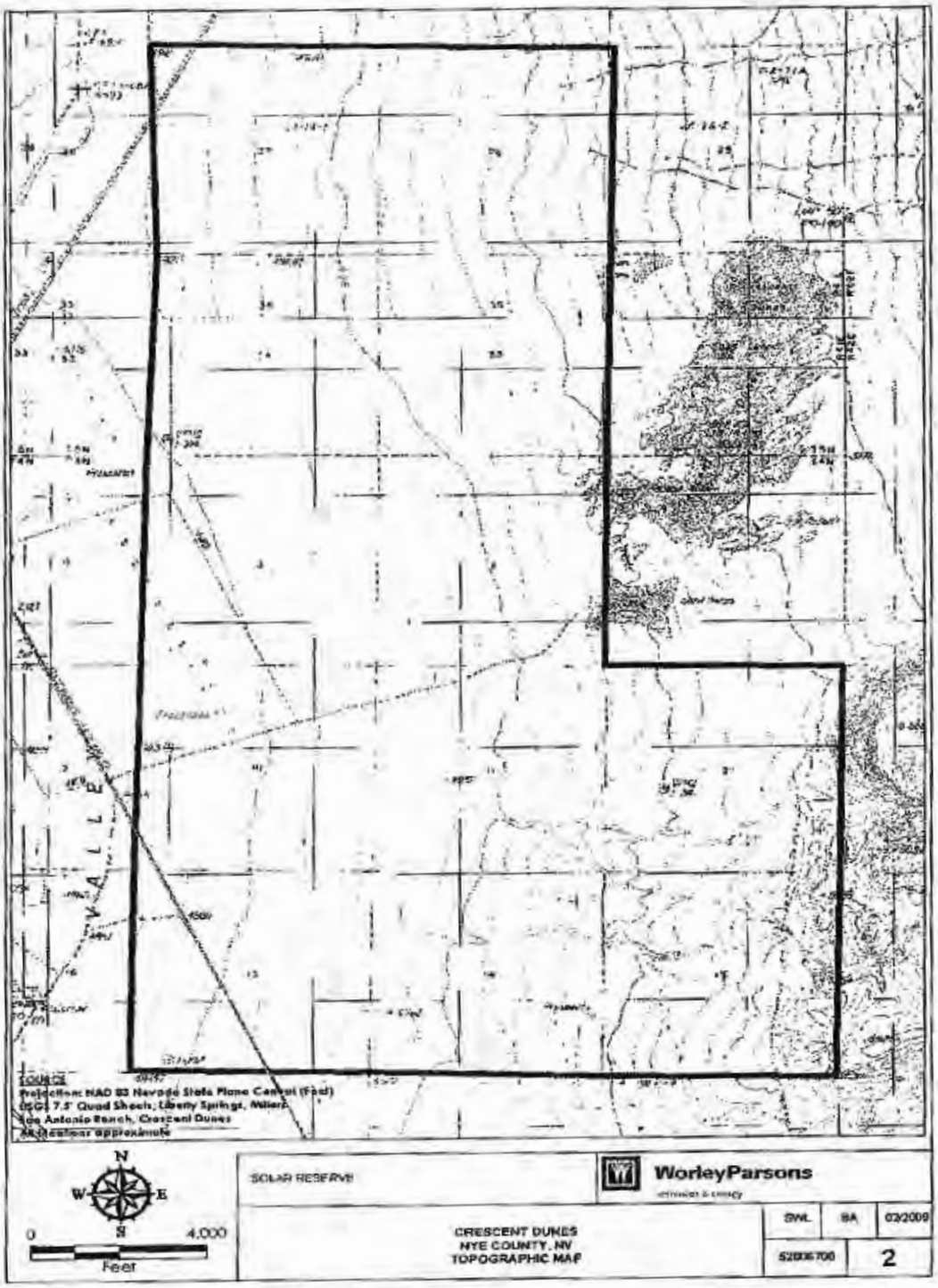
ATTACHMENT 4



ATTACHMENT 4 – Site Map

ATTACHMENT 5

FEDERAL PRELIMINARY LIST OF ALL APPROVALS AND PERMITS

Regulatory Agency Level	Agency Issued	Permit/Approval Required	Regulatory Requirement Summary	Comments/Applicability
FEDERAL	BLM	Application for transportation and Utility Systems and Facilities on Federal Lands (SF 299) (Right-of-Way Authorization Permit)	This Right-of-Way Authorization permit serves all commercial solar energy facilities per BLM Instruction Memorandum No. 2007-097, April 4, 2007 (BLM Solar Energy Development Policy).	This application starts the process to gain right-of-way on BLM land; same as the BLM's pervious Conditional Land Use Permit.
FEDERAL	BLM	Environmental Assessment (EA) or Environmental Impact Statement (EIS)	An evaluation of the Project's effects on natural and human resources to determine the potential for significant impacts.	Preparation of an EIS is required if significant impacts can not be mitigated.
FEDERAL	BLM	Plan of Development (POD)	Plan for construction and operation of solar facility must be completed prior to beginning of the NEPA process. POD provides full Project description including applicant information, site location, maps, and proposed operating plan.	
FEDERAL	BLM	National Historic Preservation Act (NHPA) Section 110; EO11593	Archaeological contractor needs to complete Class I inventory (e.g., file search for sites within area of potential effect (APE)). Contractor needs to complete 100 percent Class III survey of APE. If any historic structures are present, additional documentation could be needed.	
FEDERAL	BLM to contact Arizona SHPO and Tribal Historic Preservation Office	NHPA, Section 106 Review (36 CFR 800)	Information for Section 106 compliance would be based partly on findings of a Class III archaeological survey. Contractor would prepare draft letters.	The Arizona SHPO, Office of Historic Preservation, Department of Parks and Recreation and appropriate Tribal Historic Preservation Officers must be consulted when Projects are subject to review under Section 106 of the NHPA. This act requires that all federal agencies take into account the effect of their actions on historic properties (properties on or eligible for the National Register of Historic Places). Requirements of Section 106 review apply to federal undertaking, funding, license, or permit. The Advisory Council on Historic Preservation (ACHP) must be provided an opportunity to comment.
FEDERAL	BLM, State Office	BLM Cultural Resource Use Permit	Permit to be obtained by archaeological contractor; application includes outline of proposed work; name of institution and Project principal investigator; dates of field work; type of investigations; description of sites(s) with specific location information; and copy of agreement with institution where collections would be preserved.	Archaeological contractor to obtain Cultural Resource Use Permit from BLM prior to beginning work.

FEDERAL PRELIMINARY LIST OF KEY APPROVALS AND PERMITS

Regulatory Agency Level	Agency	Permit or Entitlement Required	Brief Description of Regulatory Requirement	Comments/Application Type
FEDERAL	BLM, Yuma Field Office	BLM Field Use Authorization	Holder of Cultural Resource Use Permit obtains a Field Use Authorization for the Project from BLM field office.	Contact appropriate Field Office Archaeologist. Field Authorization Form requests specific information on the location, schedule and nature of the archaeological fieldwork and allows BLM to communicate specific constraints on a Project type, schedule or location.
FEDERAL	BLM	Archaeological Resources Protection Act (ARPA) of 1979, as amended Section 4	Holder of Cultural Resource Use Permit provides a research design and plan of work for the research Project to obtain an ARPA permit.	This permit would be needed if subsurface investigations are needed to identify the National Register of Historic Places significance of an identified site.
FEDERAL	U.S. DOD	DOD R-2508 Complex Sustainability Office Review and Approval	Review the Project and its potential impact on military overflights and operations	A letter from the DOD, stating that construction and operation of the array would not adversely affect DOD operations will be sufficient to meet this requirement; such a letter would be included in the EIS and submitted to the applicable County Planning agency.
FEDERAL	USFWS	Endangerd Species Act (ESA) Section 7 Consultation	Informal consultation with the USFWS will determine if listed species are present on the Project site. A BA will be prepared as part of the information consultation. If listed species are present, formal consultation with the USFWS and preparation of a BA requires site surveys by qualified and certified wildlife biologists.	BLM will initiate informal consultation with USFWS
FEDERAL	USACE	Clean Water Act, Section 404 Permit	Placement of dredged or fill materials in waters and/or wetlands, as well as the performance of any work in navigable waters of the United States, requires a USACE permit. Need to delineate all wetlands and waters of the U.S. with the potential to be affected by the Project; quantify potential impacts and propose mitigation to offset impacts.	
FEDERAL	FAA	Federal Aviation Regulation Part 139 Sec. 139.331	Any airport under FAA certification must ensure that each classifiable obstruction is removed, marked, or lighted in accordance to FAA rules.	An object would be classified as an obstruction to air navigation if it is: (1) a height of 500 feet above ground level at the site of the object; (2) a height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within 3 nautical miles of the established reference point of an airport, etc.

NEVADA PRELIMINARY LIST OF KEY APPROVALS AND PERMITS				
Regulatory Agency Level	Agency	Permit Potentially Required	Regulatory Requirement	Comment or Application Type
Federal	See Federal Preliminary List of Key Approvals and Permits.			
State or Local	NDEP Bureau of Air Pollution Control or local county Health Department, depending on project location.	Air Permit - PSD Permit (Authority to Construct).		
State	PUCN	UEPA to construct with PUCN.	NRS 704.820 – 704.900.	
State or Local, depending on location	NDEP Bureau of Air Pollution Control or Local county Health Department	Construction Permit - State/Local Permit to Construct /Operate. Same as the Authority to Construct (ATC) permit.		The Air Permit is the same as the ATC permit and the Construction Permit.
State or Local, depending on location	NDEP or local county Health Department	Solid Waste Disposal Facility Permit-operations		This permit is only necessary if disposing on-site.
State	NDEP	Dust Control Plan-Power Plant Site	NDEP, NRS 321.001.	
State	NDEP	Dust Control Plan-Laydown area and Parking	NDEP, NRS 321.001.	
State	Nevada Division of Transportation (DOT)	Occupancy Permit		Occupancy Certificate is issued after final inspection, once all occupied buildings are completed
State		Permit to Open State Highway		Included in Grading Permit
State		Temporary Power Permit		Requires Nevada State Licensed Electrical contractor to sign off on grounding.

NEVADA PRELIMINARY LIST OF KEY APPROVALS AND PERMITS				
Regulatory Agency Level	Agency	Permits Potentially Required	Regulatory Requirement	Comment or Application Type
State	NDEP Bureau of Air Pollution Control	CEMS Certification Plans		Continuous Environmental Monitoring Systems.
State	NDEP Bureau of Water Pollution Control	SPCC - Construction		
State	NDEP Bureau of Water Pollution Control	SPCC - Operations		
State	State of Nevada Fire Marshall	Health Permit for Hazardous Materials		This permit needs to be filed within the first 30 days of operation.
State		AST Permit/Notification (For Petroleum Storage)		
State		Environmental Lab Certification		
State	Nevada State Office of Energy	Power Flow Study		
State	Nevada State Office of Energy	Short Circuit Study		
State	Nevada State Office of Energy	Transient Stability Study		
State	Nevada State Office of Energy	Interconnect Agreement		
State	Public Utilities Commission of Nevada	System Impact Study		
State		Network Upgrade Agreement		
State		Transmission Service Agreement		
State		Substation Design and Construction Agreement		
State		Transmission Construction Permits		

NEVADA PRELIMINARY LIST OF RE APPROVALS AND PERMITS				
Regulatory Agency Level	Agency	Permit Potentially Required	Regulatory Requirement	Comment or Application Type
State	NDEP Bureau of Water Pollution Control	SWPPP		This permit is the SWPPP.
State	NDEP Bureau of Water Pollution Control	SWPPP for Operations		Provide a NOI for filing after stormwater discharge pond design has been developed. NOI and SWPP must be filed simultaneously within one month of the start of operation.
State	NDEP Bureau of Water Pollution Control	Soil Erosion and Sediment Control Plan - Operations		Part of SWPPP
State	NDEP Bureau of Water Pollution Control	Storm Water Detention Plan - Operations		Part of SWPPP
State	NDEP Bureau of Water Pollution Control	Groundwater Discharge Permit		
State	NDEP Bureau of Water Pollution Control	AST Permit/Notification (For Petroleum Storage)		
State	Nevada Division of Water Resources	Dam Safety Permit		
State	Nevada Division of Wildlife	Artificial Pond Permit		
State	State Health Division, Department of Human Resources, Building Department	On-site Sanitary Disposal System (Septic System) Permit		
State	NDEP Bureau of Water Pollution Control	Ground Water Well Approval (Point of Diversion Permit (Permanent))		
State	NDEP Bureau of Water Pollution Control	Ground Water Well Approval (Point of Diversion Permit (Temporary))		