NVEnergy

November 23, 2011

Breanne Potter
Assistant Commission Secretary
PUBLIC UTILITIES COMMISSION OF NEVADA
1150 East William Street
Carson City, Nevada 89701-3109

Re: Docket No. 10-09026 – Application of Sierra Pacific Power Company for UEPA Permit to Construct the Anaconda Moly 230 kV Substation Expansion Project – Submission of Permits and Request to Issue Permit to Construct

Dear Ms. Potter:

On May 16, 2011, the Commission issued a Compliance Order in the above-docketed proceeding granting the application of Sierra Pacific Power Company ("Sierra Pacific") for authority under the Utility Environmental Protection Act ("UEPA") for a Permit to Construct the Anaconda Moly 230 kV Substation Expansion Project, subject to Sierra Pacific obtaining and filing with the Commission:

(a) A U.S. Fish and Wildlife Service Endangered Species Act Section 7 consultation between the U.S. Bureau of Land Management and the U.S. Fish and Wildlife Service;

(b) A Stormwater General Permit from the Nevada Department of Environmental Protection; and

(c) A Surface Disturbance Air Quality Permit from the Nevada Department of Environmental Protection.

[See Ordering Paragraph 1]

Sierra Pacific has obtained the following permits and attaches them hereto:

(1) Section 7 Consultation Memorandum from Ren Lohoefener of the U.S. Fish and Wildlife Service to Amy Lueders of the U.S. Bureau of Land Management confirming its review and approval of the Avian and Bat Protection Plan for the Crescent Dunes Solar Energy Project. [Attachment 1]

(2) Stormwater General Permit No. NVR100000, Project ID Number CSW-21953 issued to Tonopah Solar Energy, LLC, the sponsor of the Crescent Dunes Solar Energy Project, by the Nevada Division of Environmental Protection. [Attachment 2]

(3) Surface Disturbance Air Quality Permit No. AP4911-2765 issued by the Nevada Department of Environmental Protection. [Attachment 3]

All three authorizations are for the Crescent Dunes Solar Energy Project and for the upgrades Sierra Pacific is constructing to its Anaconda-Moly Substation to interconnect the Crescent Dunes Solar Energy Project to the Sierra Pacific transmission system.

With this submission of all compliance items, Sierra Pacific requests that the Commission issue a Permit to Construct the Anaconda-Moly 230 kV Substation Upgrade Project.

Please contact me if you have any questions about this submission.

Very truly yours,

Christopher A. Hilen
Associate General Counsel

Enclosures

cc: Service List Docket 10-09026

ATTACHMENT 1

SECTION 7 CONSULTATION

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Southwest Region
2800 Cottage Way, Room W-2606
Sacramento, California 95825-1846

JUN - 1 2011

Memorandum

To: Amy Lueders, Acting Director, Nevada State Director, Bureau of Land Management, Reno, Nevada

From: Ren Lohoefener, Regional Director, Pacific Southwest Region
Sacramento, California

Subject: Crescent Dunes Solar Energy Project Avian Bat Protection Plan

The U.S. Fish and Wildlife Service (Service) appreciates the opportunity to review and provide comments on the Crescent Dunes Solar Energy Project Avian and Bat Protection Plan (ABPP). Our review is in the context of our legal mandate and trust responsibility to maintain healthy migratory bird populations for the benefit of the American public pursuant to the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA).

This solar project employs the new "Power Tower" technology, for which the potential impact to wildlife is poorly understood, particularly concerning the limits for the cone of super-heated air. The Service has been working cooperatively with Tonopah Solar Energy, LLC and its contractor, JBR Environmental Consultants, Inc., on the development of their ABPP to minimize and monitor project impacts to migratory birds and eagles. The Service appreciates Tonopah Solar Energy's cooperation and willingness to continue coordinating with the Service to ensure that the project monitoring methods will result in statistically valid data collection to inform adaptive management decisions. The Service believes that Tonopah Solar Energy's ABPP for the Crescent Dunes Solar Energy Project, given our present state of knowledge, is appropriate in its adaptive management approach to avoid and minimize take of bats, migratory birds and eagles.

Please be advised that the ABPP is not a surrogate permit, therefore it does not limit or preclude the Service from exercising its authority under any law, statute, or regulation, nor does it release any individual, company, or agency of its obligations to comply with Federal, State, or local laws, statutes, or regulations.

When permits are available, this project specific ABPP could serve as the basis for a programmatic eagle take permit application. Please contact Ms. Heather Beeler, Eagle Permit Specialist, at heather_beeler@fws.gov or 916/414-6651 for questions regarding this process.

cc:
Rob Howe, Tonopah Solar Energy, LLC., Catherine Clark, JBR Environmental Consultants, Inc.
Laura Richards, Nevada Department of Wildlife

Avian and Bat Protection Plan
Crescent Dunes
Solar Energy Project

Nye County, Nevada

Prepared for:

TONOPAH SOLAR ENERGY, LLC
2425 Olympic Boulevard
Santa Monica, California 90404

Contact: Rob Howe
(310) 315-2270

Prepared by:

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Reno, Nevada 89521

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(775) 747-5777

May 25, 2011

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List of Acronyms

ABPP	Avian and Bat Protection Plan
APLIC	Edison Electric Institute's Avian Power Line Interaction Committee
APP	Avian Protection Plan
BGEPA	Bald and Golden Eagle Protection Act
BLM	Bureau of Land Management
CDSEP	Crescent Dunes Solar Energy Project
CSP	concentrating solar power
DEIS	Draft Environmental Impact Statement
ESA	Endangered Species Act
FAA	Federal Aviation Administration
HTF	heat transfer fluid
MBTA	Migratory Bird Treaty Act
NAC	Nevada Administrative Code
NDOW	Nevada Department of Wildlife
NMFS	National Marine Fisheries Service
NNHP	Nevada Natural Heritage Program
NRS	Nevada Revised Statutes
REA	Resource Equivalency Analysis
TSE	Tonopah Solar Energy, LLC
USFWS	U.S. Fish and Wildlife Service

Avian and Bat Protection Plan
Crescent Dunes Solar Energy Project
Nye County, Nevada

1.0 Introduction

1.1 SCOPE

An Avian and Bat Protection Plan (ABPP) is a project-specific document that delineates a program designed to reduce the potential risks of avian and bat mortality that may result from the interaction of these animals with project facilities.

In September 2010, the Bureau of Land Management (BLM) prepared the *Tonopah Solar Energy, LLC, Crescent Dunes Solar Energy Project, Draft Environmental Impact Statement* (DEIS). The DEIS provides a project-specific analysis of the potential impacts to bats and birds resulting from the proposed Crescent Dunes Solar Energy Project (CDSEP). Tonopah Solar Energy, LLC (TSE) has voluntarily prepared this ABPP in compliance with federal regulations to outline project-specific practices and measures for reducing avian and bat impacts potentially resulting from the project.

This ABPP has been developed based on recommendations from the Avian Protection Plan (APP) Guidelines prepared by the Edison Electric Institute's Avian Power Line Interaction Committee (APLIC) and the U.S. Fish and Wildlife Service (USFWS) in 2005. The APP Guidelines provide guiding principles to utilize in the development of an ABPP and thus reduce avian mortality. The following principles are outlined in the APP Guidelines:

- Corporate Policy
- Training
- Permit Compliance
- Construction Design Standards
- Nest Management
- Avian Reporting System
- Risk Assessment Methodology
- Mortality Reduction Measures
- Avian Enhancement Options
- Quality Control
- Public Awareness
- Key Resources

1.2 GOALS OF THE AVIAN AND BAT PROTECTION PLAN

The voluntary implementation of this ABPP will fulfill several goals simultaneously, and fulfillment of each of these goals will contribute to the satisfaction of the ultimate goal of all ABPPs: to reduce avian and bat mortality. The goals specific to this ABPP are to:

- reduce the potential for avian and bat mortality by implementing specific mortality reduction actions;
- identify and isolate where avian and bat mortality has occurred or has the potential to occur to minimize future incidents;
- establish an avian and bat reporting system to document incidents of mortality caused by electrocution, heat, collision, and other plant-related features;
- assist TSE in compliance with state and federal laws regarding avian and bat species to avoid the threat of penalties and fines; and,
- improve TSE's reliability and services by reducing power outages due to avian and bat interactions and by reducing repair costs due to electrocution of the animals.

1.3 IMPLEMENTATION OF THE AVIAN AND BAT PROTECTION PLAN

TSE would do the following to implement the ABPP and thus accomplish the identified goals. These actions would also be performed routinely after implementation of the ABPP to ensure goals are not only met but also maintained. Specifically, TSE would:

- verify avian and bat mortalities, update mapped data, and develop additional data on concentrations of avian and bat species which may be impacted by the project facility;
- identify the environmental and behavioral factors that lead to areas of high avian or bat use and potentially higher numbers of electrocutions, collisions, and outages;
- assist in refining criteria and protocols to further avian and bat conservation; and,
- ensure the accuracy and detail of incident reporting.

1.4 BENEFITS OF AN AVIAN AND BAT PROTECTION PLAN

As the foremost goal central to any ABPP is reduced avian and bat mortality, avian and bat species are perhaps the most obvious to benefit when the goals of the ABPP are accomplished. While this is true, the practical effect of such a plan may also translate to advantages for TSE. Because the ABPP would reduce avian and bat mortality resulting from bird and bat interactions with TSE facilities, costs associated with avian- and bat-related outages could be avoided or held to a minimum. These costs may include monetary losses such as lost revenue during avian- and bat-caused power outages, repair costs for equipment damaged by avian and bat interaction, or administration and managerial time directed toward avian and bat conflicts. The ABPP would reduce other costs that extend beyond monetary value, such as those attributed to negative public perception.

The voluntary implementation of an ABPP would also support compliance with the state and federal regulations as described in the following section.

1.5 FEDERAL AND STATE AVIAN AND BAT PROTECTION LAWS, REGULATIONS, AND POLICY

1.5.1 Migratory Bird Treaty Act (MBTA)

The Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703-712), which is administered by USFWS, is the cornerstone of migratory bird conservation and protection in the United States. It implements four treaties that provide for international protection of migratory birds. The MBTA states: "it shall be

unlawful at any time, by any means or in any manner, to pursue, hunt, take, capture, kill…possess, offer for sale, sell…purchase…ship, export, import…transport or cause to be transported…any migratory bird, any part, nest, or egg of any such bird, or any product, whether or not manufactured, which consists, or is composed in whole or part, of any such bird or any part, nest, or egg thereof." The word "take" is defined as "to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect." In 1972, an amendment to the MBTA resulted in bald eagles (*Haliaeetus leucocephalus*) and other birds of prey being included in the definition of a migratory bird. The MBTA currently protects more than 800 migratory bird species, including waterfowl, shorebirds, seabirds, wading birds, raptors, and songbirds (USFWS 2008).

1.5.2 Bald and Golden Eagle Protection Act (BGEPA)

Under the authority of the Bald and Golden Eagle Protection Act (BGEPA) (16 U.S.C. 668-668d), bald eagles and golden eagles (*Aquila chrysaetos*) are provided additional legal protection. The BGEPA makes it unlawful to import, export, sell, purchase, barter, or take any bald eagle or golden eagle, their parts, products, nests, or eggs. As used in the BGEPA, "take" includes pursuing, shooting, poisoning, wounding, killing, capturing, trapping, collecting, molesting, or disturbing an eagle.

1.5.3 Endangered Species Act (ESA)

The ESA (16 U.S.C. 1531-1544) is administered by USFWS and the Commerce Department's National Marine Fisheries Service (NMFS). USFWS has primary responsibility for terrestrial and freshwater organisms, while NMFS has responsibility for marine species. These two agencies work with other agencies to plan or modify federal projects so that they will have minimal impact on listed species and their habitats. Protection of species is also achieved through partnerships with the states, with federal financial assistance and a system of incentives available to encourage state participation.

Section 9 of the ESA makes it unlawful for a person to "take" a listed species. Under the ESA "take" is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct." Through regulation, the word "harm" has been defined by the Secretary of the Interior as "an act which actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering." However, permits for "incidental take" can be obtained from USFWS for take of endangered species which would occur as a result of an otherwise legal activity.

1.5.4 BLM Policy

BLM has implemented policies for special status species found on BLM-managed lands. BLM's list of special status species includes species that are listed or proposed for listing under the ESA and species requiring special management consideration to promote their conservation and reduce the likelihood and need for future listing under the ESA. Additionally, all federal candidate species, proposed species, and delisted species (for five years after delisting) will be conserved as BLM sensitive species (BLM 2008).

1.5.5 Nevada Regulations

The state of Nevada has identified wildlife species that are declining in their range throughout Nevada or are otherwise rare and at risk of extinction. Sensitive and protected animal species are protected in Title 45 of Nevada Revised Statutes (NRS) (NRS 501.100 through 503.104). Classification of wildlife species and related regulations are detailed in Chapter 503 of Nevada Administrative Code (NAC). Taking of these species is allowed only after obtaining necessary permits or authorizations from Nevada Department of Wildlife (NDOW).

1.5.6 Nevada State Protection and Propagation of Native Fauna

NRS 503.584 through 503.589 provide for the protection and propagation of native fauna, including migratory birds. The Board of Wildlife Commissioners determines which species will be fully protected under this statute (i.e., state of Nevada protected species).

1.6 ENFORCEMENT OF THE MBTA, BGEPA, AND ESA

The MBTA is a strict liability statute wherein proof of intent is not an element of a violation. Wording is clear in that most actions that result in a "take" or possession (permanent or temporary) of a protected species can be a violation. A violation of the MBTA by an individual can result in a fine of up to $15,000 and/or imprisonment for up to six months for a misdemeanor, and up to $250,000 and/or imprisonment for up to two years for a felony. Fines may be doubled for organizations. Penalties increase greatly for offenses involving commercialization or the sale of migratory birds or their parts. Violators of the BGEPA may be fined up to $100,000 or imprisoned for up to one year, or both. The BGEPA has additional provisions where in the case of a second or subsequent conviction of the BGEPA, penalties may be imposed of up to a $250,000 fine or two years imprisonment, or both. Felony violations of the ESA may result in fines up to $50,000 and/or one year imprisonment (for crimes involving endangered species) and $25,000 and/or six months imprisonment (for crimes involving threatened species). Misdemeanor violations of the ESA may result in fines up to $25,000 for endangered species and $12,000 for threatened species (USFWS 1998).

While these acts have no provisions for allowing an unauthorized take, and while the USFWS generally does not authorize incidental takes under these acts, the USFWS recognizes that some birds may be killed even after all reasonable measures to avoid a "take" are implemented. The USFWS Office of Law Enforcement carries out its mission to protect migratory birds not only through investigations and enforcement but also through fostering relationships with individuals and industries that proactively seek to eliminate impacts to migratory birds. While it is not possible under the act to absolve individuals, companies, or agencies from liability if they follow these recommended guidelines, the Office of Law Enforcement and the Department of Justice have used enforcement and prosecutorial discretion in the past regarding individuals, companies, or agencies who have made good faith efforts to avoid the "take" of migratory birds. The voluntary implementation of this ABPP is intended to proactively seek to eliminate impacts to migratory birds at the CDSEP.

2.0 Study Area

2.1 Description of Project Area

According to the DEIS prepared for the project, the project area is located about 13 miles northwest of Tonopah, Nye County, Nevada (BLM 2010a). The DEIS states that the project area encompasses approximately 2,950 acres, consisting entirely of BLM-administered public lands within the Tonopah Resource Management Plan planning area (BLM 1997). The CDSEP would occupy only approximately 1,600 acres within the 2,950-acre area. The 1,600 acres would be within a perimeter security fence, and only limited, temporary disturbance would occur outside the perimeter fence.

The topography of the project area is generally flat with elevations ranging from approximately 5,000 to 5,060 feet above mean sea level (BLM 2010a). Six vegetation communities or land cover types were mapped and observed in the project area and include Inter-Mountain Basins Mixed Salt Desert Scrub, Inter-Mountain Basins Semi-Desert Shrub-Steppe, Inter-Mountain Basins Active and Stabilized Dune, Inter-Mountain Basins Greasewood Flat, Intermountain Basins Playa, and Barren Lands (BLM 2010a). The Inter-Mountain Basins Mixed Salt Desert Scrub cover type accounts for approximately 2,408 acres of the total 2,950-acre project area. The next abundant cover types within the project area are Inter-Mountain Basins Semi-Desert Shrub-Steppe and Inter-Mountain Basins Greasewood Flat, occurring on approximately 176 and 120 acres, respectively. According to the DEIS, there are no wetlands, riparian zones, or waters of the U.S. within or near the project area.

2.2 Description of Proposed Project

The proposed project includes the construction and operation of a 110-megawatt (nominal) solar power generating facility and supporting components. The proposed solar power facility would use concentrating solar power (CSP) technology to generate electricity. This specific technology uses heliostats/reflecting mirrors to redirect sunlight on a receiver erected in the center of the solar field (referred to as the central receiver). The central receiver consists of a series of tubes through which a heat transfer fluid (HTF) passes and would be constructed to a height of about 653 feet above ground surface. The HTF used for the proposed project would be a salt in liquid form, which has the viscosity and appearance of water when heated. When solar energy is to be collected, the liquid salt would be routed through the receiver tubes. As the liquid salt passes through the receiver it would be heated by the concentrated solar energy, and then would be routed to a large insulated tank where it could be stored with minimal heat loss. When electricity is to be generated, the heated salt would be circulated through a series of heat exchangers to generate high-pressure superheated steam which in turn would be used to power a conventional Rankine cycle steam turbine/generator. Powering of the turbine/generator would produce the actual electricity product. The exhaust steam from the turbine would be condensed and returned via feed-water pumps to the heat exchangers, where it would be converted to high-pressure superheated steam in a closed cycle. The energy in the heated salt would be depleted after generating steam and would be routed to the cold salt tank for reuse the next day. Hybrid cooling processes would be used for this project to reduce water used for cooling while maintaining efficient power generation.

Major construction and operational components of the project include:

- Central receiver tower –The concrete tower would be approximately 538 feet tall and would house a 100-foot-tall cylindrical solar receiver and a 15-foot maintenance crane. The total height would be approximately 653 feet above ground surface, and the tower would have appropriate lighting for aviation safety.
- Heliostat array –The solar array would consist of a circular field encompassing an area with a radius of 4,300 feet (approximately 1,330 acres) where the heliostats (or mirrors) would be located.
- Power block –The power block would be contained to a circular area with a radius of about 400 feet and would house the central receiver tower, storage tanks, a conventional steam turbine, an air-cooled condenser, a cooling tower, transformers, heat exchangers, power block buildings, and other ancillary equipment. NOTE: The power block is located near the center of the heliostat array and is the location of all power generation equipment.
- Reverse osmosis water treatment system and evaporation ponds –These facilities would purify the groundwater to be used in the production of electricity and provide a means for wastewater disposal.
- Hybrid cooling system –An air-cooled condenser with a wet cooling augmentation system would reduce water consumption used for cooling by use only during times of high electricity demand or to maximize system efficiency.
- Thermal storage system –The storage system would include two large, insulated storage tanks and associated piping for the liquefied salt, one “hot” tank for the storage of the materials prior to use in generating the steam, and a “cool” tank for storing salt prior to resending it to the central tower for heating.
- Transmission line –The outgoing transmission line would follow the proposed project site access road and head northwest to where the existing Millers to Anaconda 120-kilovolt transmission line (owned and operated by NV Energy) is located. The outgoing transmission would then be routed to NV Energy’s existing Anaconda Moly Substation along a path parallel to the Millers to Anaconda transmission line for a total distance of approximately 7.5 miles. A temporary 55-kilovolt transmission line would be constructed in the permanent project ROW for supply of construction power.
- Interconnections –The project would interconnect to the Anaconda Moly Substation located approximately 6 miles due north of the generating facility location.
- Access roads –A paved, two-lane access road would extend approximately 1,500 feet from Pole Line Road to the facility. An existing access road that follows the Millers to Anaconda transmission line would be used for access during construction and for maintenance of the transmission line. Pole Line Road would also be used for access to the transmission line where the line would follow Pole Line Road.
- Building and enclosures –A control building, warehouse, and other buildings would be developed within the project area to support operations of the facility.
- Storage tanks –Tanks would be constructed to store de-mineralized water, water that is not de-mineralized, liquid salt or HTF, lube oil, and other materials for the power block.

- Wastewater –Two types of wastewater would be generated, industrial and domestic. The industrial wastewater would be generated from the cooling tower blow down and from the reverse osmosis water treatment system. The wastewater from this process would be piped to three lined evaporation ponds. Each pond would be up to 10 acres in size. Domestic wastewater would be generated from toilets, showers, kitchens, and sinks and would be directed to an on-site sanitary septic system and on-site leach field.
- Construction facilities – Facilities would include an office trailer, material lay down areas, rock processing equipment, a portable concrete batch plant, a temporary aboveground storage tank for diesel fuel, portable sanitary toilets, and a temporary septic system.
- Borrow site –A material borrow site would be required for extracting aggregate for the construction of the access road and the base of the proposed facility. This material would come from a borrow site located next to an existing pit used by Nye County Public Works. This site would be used only during facility construction.
- Lighting Systems – The lighting system for the facility would be limited to areas required for safe operation of the facility. Where lighting is required, it would be designed and installed to minimize visual impacts in the region.

3.0 Wildlife Resources

3.1 MAMMALS

The main components of vegetation in the project area include greasewood, blackbrush, four-wing saltbush, and Indian ricegrass. This vegetation provides food, water, and cover for many small mammals such as black-tailed jackrabbits (*Lepus californicus*), kit foxes (*Vulpes macrotis*), ground squirrels (*Spermophilus* spp.), desert woodrats (*Neotoma lepida*), pocket mice (*Perognathus* spp.), deer mice (*Peromyscus maniculatus*), grasshopper mice (*Onychomys* spp.), and kangaroo rats (*Dipodomys* spp.) (BLM 2010a).

3.2 GAME SPECIES

According to NDOW, the project area falls within designated pronghorn antelope (*Antilocapra americana*) habitat. Pronghorn antelope tracks were observed in the project area during field surveys, and it is likely that they utilize this area. Mule deer (*Odocoileus hemionus*) likely use this area for foraging; however, the area has not been designated as important or unique habitat for this species by the NDOW. It is unlikely that bighorn sheep (*Ovis canadensis*) utilize the area because they prefer the steep cliffs of the surrounding mountain ranges; however, bighorn sheep may migrate through the area (BLM 2010a).

3.3 BIRDS

Most birds that utilize the project area are protected by the MBTA; however, some birds may utilize the project area year round. For example, ravens (*Corvus corax*) may prey on reptiles, insects, and small mammals that are present throughout the project area. Horned larks (*Eremophila alpestris*), sage sparrows (*Amphispiza belli*), and song sparrows (*Melospiza melodia*) may forage on seeds and insects in the project area and were observed in the project area during surveys. Singing black-throated sparrows (*Amphispiza bilineata*) were observed in the project area and would be considered migrants. Both common ravens and horned larks were observed during field surveys within the proposed area (BLM 2010a).

3.4 REPTILES

A wide variety of reptiles may be present in the project area, including western whiptail (*Cnemidophorus tigris*), leopard lizard (*Gambelia wislizenii*), Great Basin gopher snake (*Pituophis catenifer*), and desert horned lizard (*Phrynosoma platyrhinos*). These species as well as others are present in a wide variety of valley habitats and most likely utilize the project area (BLM 2010a).

4.0 Species of Interest

4.1 Protected Species Criteria and Utilization of Project Area

In this ABPP, the term "protected species" encompasses all avian and bat species that are protected by any one or more of the laws, policies, or regulations described in Section 1.5 of this document. Specifically, this includes:

- all avian and bat species that are listed as threatened or endangered species or are proposed or candidates for listing under the ESA of 1973 as amended;
- all avian species extended protection under the MBTA;
- bald and golden eagles extended protection under the BGEPA;
- all avian or bat species that the state of Nevada extends protection to through NRS 501.100–503.104, NRS 527.050, and/or NRS 527.60–527.300; and,
- all species identified as BLM sensitive species in Nevada.

Regardless of whether a bat or bird species is protected by regulation, law, or agency directive, the ultimate goal of this ABPP is to provide protection to all avian and bat species that may interact with the project facilities.

4.2 Protected Species Potentially Occurring within the Project Area

According to the DEIS prepared for the project (BLM 2010a), a concise list of potentially occurring protected wildlife species was compiled from data from the USFWS; the BLM Sensitive Species list for Nevada; the Nevada State Protected, Threatened, and Sensitive Species lists in NAC 503.030, NAC 503.050, NAC 503.075, and NAC 503.080; and the Nevada Natural Heritage Program (NNHP) database. Biologists from the USFWS, BLM, and NDOW were consulted on several occasions to provide additional input regarding protected species. The DEIS also lists the potential likelihood of each identified species to occur within the project area. According to the DEIS, the following protected species have been observed in the project area or have potential to occur in the project area:

Bat Species:

Brazilian free-tailed bat (*Tadarida brasiliensis*)
California myotis (*Myotis californicus*)
fringed myotis (*Myotis thysanodes*)
little brown bat (*Myotis lucifugus*)
long-eared myotis (*Myotis evotis*)
western pipistrelle (*Pipistrellus hesperus*)
western small-footed myotis (*Myotis ciliolabrum*)

Avian Species:

Brewer's sparrow (*Spizella breweri*)
burrowing owl (*Athene cunicularia*)
golden eagle (*Aquila chrysaetos*)
greater sage-grouse (*Centrocercus urophasianus*)

loggerhead shrike (*Lanius ludovicianus*)
long-billed curlew (*Numenius americanus*)
prairie falcon (*Falco mexicanus*)
sage sparrow (*Amphispiza belli*)
short-eared owl (*Asio flammeus*)
Swainson's hawk (*Buteo swainsoni*)
vesper sparrow (*Pooecetes gramineus*)

The DEIS indicates that is unlikely that the little brown bat or the long-eared myotis occur in the project area with the exception of when either species is migrating. All other bats listed above are described in the DEIS as potentially foraging within the project area. The DEIS indicates that the presence of greater sage-grouse in the project area is unlikely, due to the general lack of suitable sagebrush habitat preferred by the bird.

Although 11 avian species were identified in the DEIS, most species that could potentially occur within the project area would be considered protected species. The MBTA alone would render most of these observed or potentially occurring species as protected, as the act protects all native birds commonly found within the Tonopah Field Office district, with the exception of gallinaceous species (upland game birds) and introduced, non-native species. Many species, such as the golden eagle or burrowing owl, are protected by the MBTA in addition to other regulations or listings, such as the BGEPA or listing on Nevada BLM Sensitive Species lists.

Both ground surveys and aerial surveys for nesting golden eagles were conducted by the BLM in June 2010 (BLM 2010b). The survey area included a 10-mile buffer around the project area. Prior to performing surveys, background research was conducted to determine the location of known golden eagle nests in the area. Then the area within the 10-mile buffer was evaluated for potential golden eagle nesting habitat. In the first ground survey area, one golden eagle nest was found occupied at one of the previously known nest sites approximately 8 miles southeast of Crescent Dunes. The BLM determined occupancy at this nest based on the presence of one nestling and one adult visible in the nest.

The other previously known golden eagle nest was determined to be unoccupied. No evidence of nesting material or nest site were found at or near the known location previously used. No nests were found in the second ground survey area. Potential habitat exists; however, it would be considered marginal based on the relatively small extent of cliff-like features and rock outcrops (BLM 2010b).

Two incidental sightings of golden eagles were made during the ground surveys: one of a soaring adult in T4N, 42E, Section 14, and the second of an immature in T5N, R42E, Section 28.

No additional active golden eagle nests were found during the aerial survey. One inactive golden eagle nest was found approximately 4 miles east of the project area. Old whitewash and a significant amount of nesting material were present. Some maintenance of the nest would need to occur to make in order for it to be utilized, although the nest condition would be considered fair to good.

Two additional incidental sightings of golden eagles were noted. One sighting was an immature golden eagle 9 miles southwest of the project area. The other sighting was likely a recently fledged juvenile golden eagle approximately 11 miles northeast of the project area (BLM 2010b).

Based on the findings from the ground and aerial surveys, one confirmed active nest is located within the 10-mile buffer of the project area. The nearest potential project disturbance to this nest is approximately 7 miles away. Because of the location and direction the nest faces on the cliff, the nest would be shielded from the disturbance by topography (BLM 2010b).

Sufficient evidence of suitable nesting habitat was found in the San Antonio Mountains, and one other previously used golden eagle nest was found. Based on the extent of habitat, it is likely this area could support two active golden eagle nests in one nesting season. Overall, the potential golden eagle cliff nesting habitat within 10 miles of the project area is limited (BLM 2010b).

Other protected bird species that could potentially utilize the project area may include the black-throated sparrow, red-tailed hawk (*Buteo jamaicensis*), common raven, horned lark, barn swallow (*Hirundo rustica*), rock wren (*Salpinctes obsoletus*), Say's phoebe (*Sayornis saya*), and white-crowned sparrow (*Zonotrichia leucophrys*). Big Smoky Valley, where the project area is located, contains playas that may be seasonally inundated and could provide temporary habitat for migrating birds such as American avocet (*Recurvirostra americana*) or northern harrier (*Circus cyaneus*) (Great Basin Bird Observatory 2009). Many other protected species of birds may potentially utilize the project area in addition to the species listed here. Avian species composition and density in the project area would vary with season and available habitat type. Avian species diversity would be highest during the spring and summer months, when Neotropical migrant species are present in the area.

5.0 Threat Assessment

5.1 Avian and Bat Use of Crescent Dunes Project Components

5.1.1 Central Receiving Tower

Avian species potentially utilizing the central receiving tower may include raptors and corvids (ravens and crows), which may find the height and prominence of the tower appealing for roosting and nesting. The tower may also provide a perch location from which raptors can hunt prey below. The tower, however, is located near the center of the heliostat field and a minimum of 3,800 feet from native foraging habitat. It is anticipated that the high temperatures in and around the central receiver when in operation would deter avian species from being attracted to the tower. As required by the Federal Aviation Administration (FAA; see below), the tower would be lighted during the day (with white blinking lights) and at night (with red blinking lights). The tower lighting is likely to attract insects, which may in turn attract bats.

5.1.2 Heliostat Solar Field

It is not anticipated that bats or avian species would intentionally or deliberately utilize heliostats for any nesting, roosting, or perching purposes since the mirrors would not be stationary and would rotate continuously during the day to track the sun during operations. However, avian species may mistake the mirrored surfaces of the heliostats for open water, which is generally a source of foraging habitat.

5.1.3 Transmission Lines and Power Poles

Transmission lines and poles may potentially be utilized as perching and roosting habitat for many bird species. Regardless of whether they are foraging or nesting, birds on or near the ground surface may feel susceptible to predators or other threats that could be hidden in the surrounding vegetation. Since the transmission lines and poles would be located well above the tallest vegetation in the project area, birds perched or roosting on these structures have a more open and distant view of their surroundings. The awareness of their surroundings, combined with the protection of perching or roosting at heights well above terrestrial predators, would appeal to many species.

Raptors are opportunistic and may use power poles for a number of purposes, including nest sites, high points from which to defend territories, and perches from which to hunt prey. Hunting from a perched position is energetically efficient for a bird, provided the bird has a view of quality prey habitat. Generally, the power poles would place raptors at a considerable elevation above the surrounding terrain, offering an ideal hunting position and high point for defending territory. Nesting on power poles would allow a raptor a high point from which to defend the nest and diminishes the threat of nest predation from reptiles and mammals.

5.1.4 Evaporation Ponds

The project would include three evaporation ponds that would receive piped industrial wastewater generated by the cooling tower blow down and occasionally from the first pass reverse osmosis system (used for pre-treatment of groundwater supply) and the steam cycle blow down. Steam from the steam cycle blow down may also be diverted into the cooling tower and evaporated in these ponds (Worley

Parsons 2010). Since existing water sources are relatively scarce in the region surrounding the project area, the water in the evaporation ponds would tend to attract bats and various avian species. This wastewater would actually be a brine solution, however, which is water that contains large amounts of sodium. A study at a solar-energy facility near Harper Dry Lake in the Mojave Desert of California revealed that invertebrates utilize evaporation ponds during larvae and pupae stages and can successfully emerge as adult insects (Herbst 2006). It is expected that aquatic insects would be present in the three evaporation ponds at the project site because the ponds would be similar to the evaporation ponds at the project site near Harper Dry Lake. As a potential forage source, these aquatic insects would attract avian and bat species to the ponds. This forage source combined with the consistent availability of water may encourage some avian species to nest or roost at the ponds, or on other components of the solar utility system.

5.2 CAUSES OF AVIAN AND BAT MORTALITY

5.2.1 Collision

5.2.1.1 Central Receiving Tower

The potential for avian and bat species to collide with the central receiving tower would be present when avian species are in flight during adverse environmental conditions, such as rain, fog, strong winds, or other similar periods of low visibility. Avian and bat species are also subject to collision with the tower when flying while distracted. Potential distractions could include foraging, territorial chases, escape from predators, nearby human activity, or other such action that results in aggressive and swift flight, or erratic and fear-driven flight. The potential for collision with the central receiving tower would also be present if avian species were flying to or from a nesting or roosting site on the tower.

The FAA requires that structures that reach heights greater than 199 feet above ground surface be lighted. Because the central receiving tower would reach a height of approximately 653 feet above ground surface, it would be lit per FAA requirements. This lighting could attract birds to the tower at night, potentially resulting in collisions with the structure. It is reported that birds flying at night are attracted to lights (Manville 2005) or may become disoriented and congregate around the illuminated areas rather than continuing flight toward the birds' original destinations (Towerkill.com n.d.). Studies performed at towers less than 480 feet tall have shown that avian collisions are less likely to occur when flashing lights are utilized rather than steady-burning lights (Gehring, Kerlinger, and Manville 2009). Red lights on towers seem to disorient migrating birds more than white or green lights (Rich and Longcore 2006).

5.2.1.2 Transmission Lines and Power Poles

Bat species and avian species are susceptible to potential collisions with the transmission lines and power poles. Bats are most active in low-light to dark hours. While bats typically navigate and forage by emitting and receiving high-frequency sound (echo-location), bats not actively echo-locating may fail to detect the transmission lines or poles when in flight. Avian species may be susceptible to collisions with transmission lines due to an inability to see or distinguish the lines. If the transmission lines are spotted during flight, heavy-bodied, less agile birds or birds within large flocks may lack the ability to quickly

negotiate the lines, making these birds more susceptible to a potential collision. Adverse weather obscuring sunlight and moonlight could contribute to difficulties bats and birds may have seeing or detecting the transmission lines.

Bats and birds may be distracted when foraging to the extent that awareness of their surroundings is reduced. This level of distraction is also possible during reproductive activities, territorial chases, and when fleeing a predator. Even if awareness of surroundings is retained, distracted bats and birds would be subject to potential collisions with transmission lines and power poles. Raptors that may hunt from perches on the power poles and aerial foraging birds (swifts, swallows) would be the bird species most susceptible to collision while foraging. The potential for collision with the power poles is also present when avian species are flying to or from a nesting or roosting site on the power pole.

Occasional human activity in the project area could potentially distract birds and bats causing them to feel threatened. Such birds may take flight while distracted by human activities, a distraction which could contribute to a potential collision with the transmission lines and power poles.

5.2.1.3 Heliostats

The reflective surfaces of the heliostats (front-side only) may be mistaken as open water or open air space by avian species, which could attract birds and result in potential collisions. An avian mortality study at Solar One, an existing project similar to the proposed project, found that 81 percent of the observed avian mortalities at the Solar One project site were the result of collisions with project components and structures. More than 75 percent of these collision-related mortalities were from collisions with the heliostats at Solar One (McCrary et al. 1986). However, the study found that only a small proportion (less than 1 percent) of the total birds in the area suffered mortality from the Solar One project.

5.2.2 Electrocution

5.2.2.1 Transmission Lines

Avian electrocutions can occur when a bird completes an electric circuit by simultaneously touching two energized parts or an energized part and a grounded part of the electrical equipment. The reason birds may complete an electric circuit can be attributed to two interrelated factors: environmental factors and engineering factors (APLIC 2006).

Environmental factors are naturally occurring factors that affect avian use of power poles. The behavioral and biological characteristics unique to individual avian species determine in part how that species will utilize power poles, and affect their potential to suffer electrocution from such use. Behavioral and biological characteristics include the physical size and shape, foraging characteristics, flight pattern, and territorial traits of the species. Environmental factors also include the natural topography of the area, vegetation in the area, available forage and prey in the area, and weather. These factors affect the behavior of birds. Eagles are the most commonly reported electrocuted avian species, with golden eagles reported to suffer electrocution 2.3 times more frequently than bald eagles (Manville 2005).

Engineering factors include the physical design and construction of the electrical system, including the transmission lines, power poles, transformers, and other components of the system. A bird may potentially come into simultaneous contact with two energized conductors or an energized conductor and grounded hardware if the spacing between any of these two components is inadequate. If such contact were to occur, an electric circuit would be completed and electrocution would result (APLIC 2006).

5.2.2.2 Bird Nesting

Nests on power transmission structures that pose the greatest risk to birds are those that are built in close proximity to energized conductors and hardware. While a nest that is not in close proximity to energized parts may not be an electrocution risk in and of itself, it would tend to cause the parent bird and possibly nest predator birds to routinely land on other parts of the power pole or surrounding poles that may be unsafe (APLIC 2006). In the project area, the species most likely to nest on power poles are ravens and raptors.

5.2.3 Evaporation Ponds

Since existing water sources are relatively scarce in the region surrounding the project area, the evaporation ponds would tend to attract bats and various avian species. Bats could potentially ingest water (brine solution) from the ponds and consequently suffer sodium toxicity which could cause illness or death of the bat (Arizona Game and Fish Department 2010). Bats that forage on insects at the evaporation ponds or near the evaporation ponds could potentially fall into the ponds and drown if no escape route is available or found. Bats and birds that have fallen into ponds may also be identified as ideal prey by raptors since they may become exhausted or distracted while struggling to escape the water.

Waterfowl, shorebirds, and other resident or migratory birds that drink or forage at the ponds might be harmed by hyper-saline conditions of the water or brine solution. Birds using the evaporation ponds could ingest the water and become ill or die from sodium toxicity (USFWS 2009). Like bats, birds (other than aquatic species) could potentially fall into the water while utilizing the ponds and drown if no escape route is available. Additionally, birds that utilize the water may experience a build-up of sodium crystals in their feathers. The sodium crystals would reduce the feathers' thermoregulatory properties, which could potential cause mortality from hypothermia during cold weather (USGS 2009). The accumulation of salt crystals on the feathers of birds may also impede their ability to fly, which could potentially result in mortality.

5.2.4 Burning from Concentrated Solar Energy

During normal operation of a solar tower facility, solar energy is collected by reflecting sunlight from heliostats onto the central receiver, mounted on top of the tower. Thus, the surface temperature of the receiver itself will exceed 1,000 degrees Fahrenheit during operation. The receiver would be turned on and off daily and would not be operated at night. During startup, testing, and maintenance of the CDSEP, the heliostats would temporarily direct solar energy to standby points, which are points on the central receiving tower located just below the receiver. At the site of the previously mentioned avian mortality study at the Solar One project, several birds were found dead at the base of the central

receiving tower; these birds had been severely singed or burned (McCrary et al. 1986). The dead birds were small, fast-flying species (swallows), and the authors speculated that the birds may have been unable to alter course at high speeds to avoid the heat in time to prevent injury. Based on these findings, it is possible that avian species in the project area flying at elevations of the receiver or just below it (approximately 500 feet to 638 feet above ground surface), or birds attracted to the tower as a potential perch or roost site, may be at risk of injury or death from burns. Bats are much more active during night hours when solar energy would not be concentrated, and thus would not likely be subject to burns.

5.3 EFFECTS TO AVIAN AND BAT SPECIES

5.3.1 Effects from Project Construction

5.3.1.1 Central Receiving Tower and Heliostat Solar Field

Direct impacts would occur to golden eagles and migratory birds as a result of the project because project construction would remove approximately 1,500 acres of potential foraging habitat for golden eagles and nesting and foraging habitat for migratory birds. Most of this habitat consists of Inter-mountain Basins Mixed Salt Desert Scrub, which is the dominant habitat in the surrounding area. The project would not restrict bird migration throughout the lower Big Smoky Valley; however, it may remove a small proportion of the available migratory bird habitat and golden eagle foraging habitat in the area.

Most birds are highly mobile, and initial construction activities would not occur during nesting periods; therefore, it is unlikely that grading activities associated with project construction would result in bird injury or death because most birds can flee the area. However, a few species such as burrowing owls may be more susceptible to injury or death during grading activities because they may hide in their burrows and not be able to flee in time. Grading activities could destroy nests; however, disturbances to nesting birds would be avoided by avoidance and minimization. Avoidance and minimization would include restricting grading activities during migratory bird breeding season (April 1 – August 31) or having a monitoring biologist on-site during grading activities so that nests can be identified and avoided. Increased noise levels during construction may cause birds to avoid the area temporarily, possibly disrupting normal behavior patterns.

No indirect effects to golden eagles or migratory birds from the construction of the proposed project are likely to occur.

Direct effects to a wide variety of special status bat species would include the removal of approximately 1,673 acres of potential foraging habitat. The Proposed Action would not restrict bat migration throughout the lower Big Smoky Valley.

No indirect effects to bats are likely to occur from the construction of the project (BLM 2010a).

5.3.1.2 Transmission Lines and Power Poles

Direct effects to golden eagles and migratory birds from construction activities would be similar to those associated with construction of the central receiving tower and heliostat solar field in that potential foraging habitat would be lost.

No indirect effects to golden eagles and other migratory birds have been identified from the construction of spur roads and installation of power poles.

Direct effects to bats from transmission line construction activities would be similar to those associated with construction of the central receiving tower and heliostat solar field in that potential foraging habitat would be lost.

No indirect effects to bat species have been identified from construction of spur roads and installation of power poles (BLM 2010a).

5.3.1.3 Evaporation Ponds

Direct effects to golden eagles and migratory birds associated with construction of the evaporation ponds would be the same as those associated with construction of the central receiving tower, heliostat solar field, transmission line, and power poles in that 40 acres of potential foraging habitat would be lost.

No indirect effects to golden eagles and migratory birds associated with construction of the evaporation ponds were identified.

Direct effects from construction of the evaporation ponds to a variety of bat species would include the temporary removal of approximately 40 acres of potential foraging habitat. Construction of the evaporation ponds would not restrict bat migration throughout the lower Big Smoky Valley.

No indirect effects to bat species associated with construction of the evaporation ponds are likely to occur (BLM 2010a).

5.3.2 Effects from Project Operations

5.3.2.1 Central Receiving Tower and Heliostat Solar Field

A potential direct effect of the project operations on golden eagles, migratory birds, and bats is death or injury resulting from collisions with structures associated with the project area. A variety of species of birds have been documented colliding with buildings and other structures, resulting in death or injury. Such collisions probably occur because of the reflection of the sky in the structure. A study on a project similar to the proposed project found that a variety of migratory birds were injured or killed after colliding with various components of the facility. However, the study found that only a small proportion (less than 1 percent) of the birds in the area were affected.

Another potential direct effect on golden eagles, migratory birds, and bats is injury or death associated with the heat generated by the central receiver/tower component of the proposed project. Reflected solar energy would be focused on the central receiver/tower, causing the surface temperature of the receiver to exceed 1,000 degrees Fahrenheit during the day. In the 40-week study at the previously mentioned project site with the central receiver, several birds were found dead at the base of the central tower; they had been severely singed or burned. The dead birds were small, fast-flying species (swallows), and the authors speculated that the birds may have been unable to alter course at high speeds to avoid the heat in time to prevent injury.

Based on these findings, it is possible that other migratory birds that fly at elevations similar to the receiving tower (600 feet) and those attracted to the tower as a potential perch or roost site, including golden eagles, may be at risk of death or injury (BLM 2010a).

5.3.2.2 Transmission Lines and Power Poles

Direct effects on migratory birds resulting from project operation of the transmission line may include injury or mortality from transmission line collisions and/or electrocutions. Birds may collide with transmission lines because transmission lines are not readily visible to them. Recent research has shown that the rate of bird collisions may be closely related to bird size. Larger birds in the project area may be particularly at risk because it is harder for them to change direction quickly. Smaller birds such as passerines are generally much more agile and may be better at avoiding transmission lines. Because the transmission line would be built in a corridor that already contains several transmission lines, the concentration of transmission lines may make them more visible, therefore making it more likely for birds to avoid the area. Bird electrocutions occur when the bird's body bridges the gap between two energized components of the transmission line. Once again, larger birds with greater wingspans may be much more susceptible to electrocution because larger wingspans can increase the potential for two points of contact. This potential effect can be mitigated by spacing the wires appropriately so that it is impossible for the wingspan of the largest birds in the area to contact two wires. Current design standards dictate these specifications (BLM 2010a).

In addition to collisions and electrocutions, electromagnetic fields may affect birds that roost or nest near transmission lines. Electromagnetic fields could affect a number of factors including but not limited to fertility rates, nest success, egg quality, and hatch success. Some studies suggest that effects of electromagnetic fields are species-specific, so the complete range of effects for birds in the area is unknown (BLM 2010a).

Not all direct impacts of the transmission line may be adverse. Recent research shows that raptors and corvids may benefit from the presence of transmission lines because they may provide more roosting or nesting opportunities (Steenhof et al. 1993). This study also found that nest success for golden eagles was higher (10 percent) for nests on transmission lines than for nests in cliffs.

Because habitat for golden eagles and migratory birds would be removed during initial grading and excavation activities, no additional indirect impacts are likely to occur with operation of the transmission line and Anaconda-Moly Substation corridor.

Introduction of a new transmission line throughout the valley may increase perching opportunities for raptors, owls, and other avian predators. These avian species may increase the predation pressures on vulnerable species, such as the bat species in the area.

Because habitat for special status bat species would be removed during initial grading activities associated with installation of the transmission line and completion of spur roads, no additional direct effects from operation of the transmission line are likely to occur.

Because habitat for bats would be removed during initial grading and excavation activities, no additional indirect impacts are likely to occur with operation of the transmission line and Anaconda-Moly Substation corridor (BLM 2010a).

5.3.2.3 Evaporation Ponds

Direct effects may include bird injury or mortality during operation because of the presence of evaporation ponds associated with the facility, the presence of additional structures in the area, and the presence of the high-temperature central receiver. The evaporation ponds may attract birds to the project site. The water in the evaporation ponds would be saturated with salt (making a brine solution). Birds using the evaporation pond could ingest the brine and die from sodium toxicity if a freshwater source is not available nearby. Additionally, birds that utilize the water may experience a build-up of sodium crystals in their feathers, resulting in a reduction of the feathers' thermoregulatory properties, causing the birds to die of hypothermia during cold weather. The accumulation of salt crystals on the feathers of birds may also impede their ability to fly.

Migratory bird habitat and golden eagle foraging habitat within the project area would be removed during construction activities. No indirect effects to these species are likely to occur during operation of the facility.

Direct effects to bats may result from the operation of the facility's evaporation ponds. Bats may be attracted to the water in the ponds (and would not be excluded by the fence around the facilities). The water in the evaporation ponds would be saturated with salt (making a brine solution). If bats ingest water from the pond, they may become ill or die from sodium toxicity. Bats could also fall into the ponds and drown if no escape route is available.

Bat foraging habitat within the project area would be removed during construction activities. No indirect effects to these species are likely to occur during operation of the facility. Additionally, project structures may provide roosting opportunities for raptors, owls, and other predatory birds that prey on bat species, thus increasing predation pressure on these sensitive species (BLM 2010a).

5.3.3 Effects from Project Maintenance

5.3.3.1 Central Receiving Tower and Heliostat Solar Field

Direct effects to golden eagles, migratory birds, and bats from maintenance activities at the central receiving tower and heliostat solar field include the potential for individuals to be crushed by vehicles. No indirect effects are expected.

5.3.3.2 Transmission Lines and Power Poles

Direct effects to golden eagles, migratory birds, and bats from maintenance activities at the transmission lines and power poles include the potential for individuals to be crushed by vehicles. No indirect effects are expected.

5.3.3.3 Evaporation Ponds

Direct effects to golden eagles, migratory birds, and bats from maintenance activities at the evaporation ponds include the potential for individuals to be crushed by vehicles. No indirect effects are expected.

6.0 Avian and Bat Protection Measures and Modifications

6.1 COLLISION

6.1.1 Central Receiving Tower

The central receiving tower would be roughly cylindrical in shape and extend upward to more than 650 feet above the ground surface. The diameter of the central receiving tower at ground level would be up to 115 feet, and although it would taper along its length, the tower would still be of a considerable diameter near the top end. Due to the sheer size of the tower most birds and bats are likely to perceive and thereby avoid its presence. The size and design of the tower also eliminates the need for guy wires, which avian and bat species may collide with if present. Additionally, the tower would not be constructed of reflective material that may be mistaken for water or air space by passing birds, and thus would be less likely to attract birds and result in collisions. The tower, along with its size, would be constructed in a manner to minimize nesting or perching opportunities. The tower would be constructed of slip form concrete rather than lattice steel, thus providing a smooth vertical or near vertical surface. Operation of the tower would also require frequent and extensive human presence and activity, which would not be conducive or favorable to nesting. Likewise parts of the tower would be subject to concentrated heat during operations, which would prevent the birds from nesting on the parts of the tower. TSE would monitor any potential perching and nesting locations on the central receiving tower as needed when it is safe to do so. TSE may also add perch deterrents to appropriate places on the tower as needed.

Because the central receiving tower would reach a height of approximately 653 feet above the ground, it would be lit per FAA requirements. The lights could contribute to avian mortality from potential collisions with the tower since lights appear to be a key attractor of night-migrating songbirds (Manville 2005). TSE would use the minimum number of lights at the minimal intensity required per FAA requirements to light the tower, and the lights would flash or blink. The utilization of flashing or blinking lights in place of steady-burning lights has been reported to reduce the likelihood of avian collisions with towers (Gehring, Kerlinger, and Manville 2009). Lights within the facility would be designed to illuminate synchronously. Plant facility lights would be fully shielded and focused downward to reduce skyward illumination. Aerial foraging avian species have been observed to feed on swarms of flying insects attracted to continuously burning artificial light sources at night (Lebbin, Lenz, Andersen, and Ellis 2007). Some bat species would be anticipated to feed on swarms of insects attracted to artificial light sources as well, considering flying insects are primary forage for many bats. Birds and bats could potentially collide with the lighted structures while foraging. Therefore, TSE would equip plant facility lights with motion detectors or power switches so that continuous illumination is avoided, except where continuous illumination is necessary for safe operations.

This would prevent swarms of insects from forming near structures equipped with lights that are not on continuously, and thus reduce potential for avian and bat collisions.

6.1.2 Transmission Lines and Power Poles

The transmission line poles would be constructed as typical three-phase H-frame structures that utilize two upright poles instead of one pole typical of mono-pole structures. The use of H-frame structures may increase the visibility of the structures to birds and bats, since the poles would be grouped in pairs connected with cross-bracing lumber. Guy wires used to add stability to monopole structures are not required as often for H-structures, which reduces the potential for collision with the thin guy wires. Any necessary guy wires would be marked with recommended bird deterrent devices (APLIC 2006 and USFWS 2000). The use of guy wires on meteorological towers would be avoided.

The transmission line poles outside of the project perimeter fence, which separates facilities inside the plant fence from undisturbed foraging habitat, would be constructed with anti-perch devices to prevent raptors from preying on small mammals from perched positions on the poles. The anti-perch devices would reduce avian use of the power poles, which could consequently reduce potential collisions with the poles.

Static transmission lines are the smallest diameter lines and therefore are potentially the most difficult for birds to see and avoid. In order to minimize collisions, all static transmission lines would undergo wire marking. Typical, commonly accepted wire marking methods would be used as needed, including placing crossed bands between the two static wires or hanging material from the static lines. Additionally, the transmission line would be constructed adjacent to two existing overhead transmission lines. This may contribute to the improved visibility of transmission lines since more would present in a concentrated area.

6.2 ELECTROCUTION

The transmission line poles would be typical three-phase H-frame structures constructed of two wood poles embedded upright into the ground without a continuous foundation. A wooden cross-arm would extend between the two poles and support three hanging insulators, each of which would hold a phase conductor (transmission line). Cross bracing made of wood would be used to stabilize the two upright poles and to support the cross-arm. A separate wooden cross-arm would be near the top of the two upright poles to support two static wires.

The use of wood reduces the potential for electrocution because wood is a poor conductor of electricity and there are fewer potential circuits present than when metal poles are used. Additionally, the power poles would be constructed in accordance with the raptor-safe design criteria recommended by the APLIC (2006). The APLIC recommends at least 5 feet of clearance between phases and any electrical ground. Each phase of the three-phase transmission line at the project would be spaced approximately 15.5 feet from each other and between 7 to 9 feet from the nearest potential electric ground. This would prevent birds, including golden eagles, which are expected to be the largest bird in the area, from completing an electrical circuit and suffering electrocution through utilization of the transmission lines.

6.3 EVAPORATION PONDS

In order to maximize the evaporation rate of the wastewater, the evaporation ponds would remain uncovered. Leaving the pond uncovered would also ensure that bats and birds do not get trapped or entangled by any sort of mesh netting or screen. According to *The Revised Nevada Bat Conservation Plan*, preliminary studies have shown artificial water sources with modifications such as wires across the top that impede direct flight patterns are a source of mortality for bats (Bradley, O'Farrell, Williams, & Newmark 2006). To further reduce potential bat and avian mortality at the ponds, TSE would incorporate several protection measures, listed below, into the design and operation of the ponds.

The evaporation ponds would be constructed with interior side slopes of 3:1 (horizontal:vertical) or steeper. This would ensure that there are no shallow areas in the evaporation ponds that would encourage or facilitate avian wading. Additionally, evaporation ponds would be designed and operated so that a minimum freeboard of 3 feet is maintained at all times. The freeboard is essentially the distance from the top of the water surface to the top of the containment berm. The freeboard would also be constructed to slopes of at least 3:1, ensuring that there are no gradual approaches or entry points to the ponds. The steep 3:1 slope approach to the water surface would be difficult for birds to negotiate and would assist in deterring avian use of the water. Anti-perching devices would also be installed around the perimeter of each evaporation pond to assist in preventing birds from having perching locations directly near the ponds. Despite these protection measures, there would still be potential for bat and avian species to accidentally fall into the water. In order to reduce mortality risks associated with drowning from an accidental fall, a textured liner would be installed at each corner of the three evaporation ponds. The corners of the pond represent the best locations to ensure that ramps intercept species swimming along the pond perimeter where most species will naturally swim to escape. The textured liner would allow bats and birds to crawl out of the water.

It is anticipated that waterfowl species capable of landing directly on the surface of the water, such as ducks and geese, would still access the pond even with implementation of the protection measures described above. Although waterfowl are anticipated to be the highest risk category, other avian species, such as shorebird species, may be present even though the ponds have been designed to minimize access. In order to protect these species and minimize mortality risks associated with salt encrustation and/or salt toxicosis from ingestion of water, proper management of the pond hydrology would be practiced (see Appendix C). The water contained in the evaporation ponds would be a brine solution. A solution is a mixture of one or more solutes dispersed in a sufficient quantity of dissolving medium solvent. In a brine solution, salt is the primary solute and water is the primary solvent. The strength of a solution is inversely related to the volume of solvent present in solution. Therefore, the salinity of the brine solution in the evaporation ponds is inversely related to the volume of water present in the ponds. If water levels are allowed to drop in the evaporation ponds, the salinity of the brine solution would increase as the solute (salt) became more present in volume. If more water is introduced to the brine solution in the evaporation ponds, the salinity of the brine solution would be reduced. Based on information provided by GeoTrans, Inc. in the Biological Resources Mitigation Implementation Plan Compliance Reports prepared quarterly from 2002 to 2008 for the Harper Lake Solar Project Inc., salt encrustation and salt toxicosis have been a rare occurrence at evaporation ponds at that project (as cited by ENSR AECOM 2008). The report describes the rare occurrences of mortality

from salt encrustation and salt toxicosis that have been observed at the Harper Dry Lake Solar Facility project as being associated with periods of low water levels in an evaporation pond. Since then, a recurrence of avian mortality has been avoided at that project through increasing the water levels in all evaporation ponds that are active at any given time.

TSE would adopt management and operation practices for evaporation ponds similar to those enacted at the Harper Dry Lake Solar Facility project to prevent avian mortality. TSE would prepare an operational plan detailing the planned operation of the ponds prior to placing the evaporation ponds in service. Such a plan would ensure the operational personnel are familiar with the design features and operation techniques designed to protect avian and bat species. TSE would install a water level gauge and a hydrometer at each active evaporation pond and gather daily water level and salinity measurements. Electrical conductivity would be used as an indicator of salinity. A direct reading thermometer with the capability of recording temperature data at least diurnally would also be installed. Salt crystallization is known to increase in cooler water temperatures, particularly temperatures of 4 degrees Celsius or colder. If the average overnight water temperature in the active evaporation ponds dips to 4 degrees Celsius or colder, a visual survey of the ponds would be conducted immediately on the following morning. If upon inspection of the active ponds the designated representative observes evidence of recent substantive increases in salt crystallization anywhere within the pond (e.g., at or near the waterline), all water would be pumped into one or two ponds to increase the pond volume and lower the subsequent average salinity within the pond(s). At the same time, the remaining pond or ponds would be pumped dry. The pond to which the combined flow is discharged during this time would be rotated each year periodically as needed so that water levels do not rise too high and minimum freeboard requirements are met. Additionally, the evaporation ponds would be designed with provisions for installing evaporative spray nozzles to be used in the event that climatic conditions are such that evaporation rates must be accelerated to maintain the minimum freeboard requirements. Implementation of these devices and operational practices, which are similar to the operations utilized to prevent avian mortality at the Harper Dry Lake Solar Facility project, would be anticipated to prevent impacts to avian and bat species.

To further avert potential impacts to avian species, TSE would install visual deterrents at active evaporation ponds. The use of visual deterrents would be intended to cause birds to feel uncomfortable with or frightened by the area surrounding the evaporation ponds and to prevent them from landing on or otherwise utilizing the ponds. The visual deterrents that TSE may install include various decoys which mimic avian and terrestrial predators, or various objects that scare or confuse birds with bright colors, motion, reflective surfaces, and surface patterns that resemble predatory bird features, such as large reflective eyes. The use of decoys that mimic avian species would be avoided during breeding season. In order to prevent birds from becoming acclimated to the deterrents, TSE would routinely redistribute them to new locations around the ponds and regularly alternate the types of deterrents used.

Implementation of the pond management practices described above would be anticipated to prevent impacts to avian and bat species at the evaporation ponds, and the installation of visual deterrents would minimize avian and bat use of the ponds.

However, TSE may elect to implement other deterrents or measures to discourage avian use of the evaporation ponds. Some of the deterrents that TSE may utilize include the following:

- In the event that climatic conditions are such that evaporation rates must be accelerated to maintain the minimum freeboard requirements at any one or more of the ponds, evaporative spray nozzles would be installed and operated at that specific pond or ponds.

- The use of a gas-fired air cannon, often referred to as a "bird cannon," may be used to haze waterfowl and frighten them away from the ponds. Bird cannons work by igniting a mixture of gas and oxygen to produce a sudden, unexpected noise similar to that of a gunshot. The unexpected noise startles birds, causing them to panic and flee the area. The noise can be projected in general directions by pointing the "barrel" of the cannon toward intended areas. The bird cannon would be stored on-site but would be used only intermittently because birds may become acclimated to the disturbance caused by cannon hazing if used regularly. Other devices may be constructed and utilized that are capable of producing similar sudden and high-decibel noises to scare waterfowl without harm.

- Sonic devices capable of producing sounds that mimic the distress calls of various avian species or the calls of various predator species may be installed around the ponds. The sounds produced by the sonic devices would frighten or alarm avian species to the extent that they avoid the pond area. The sonic devices would be used at infrequent intervals so that avian species do not become acclimated to the sounds. Ultrasound devices capable of emitting high frequency noise that irritates birds but is silent to humans may also be utilized to discourage avian use of the ponds. Ultrasounds have not been proven effective in deterring bats (Ferraro, Hygnstrom, & Vantassel 2007).

This list is only a partial inventory of the avian deterrents that TSE may implement as needed to keep birds from landing on, or otherwise using, the evaporation ponds. The deterrents that TSE implements would largely be dependent on the avian species that the deterrent was intended for and the time of year it is implemented (bird cannon would be used primarily during migration periods when waterfowl would have the greatest potential to be present). The rate at which a deterrent has been utilized would also be considered in order to prevent birds from becoming acclimated to the device. TSE may not necessarily implement each or any of the deterrents identified in the list. Additional deterrents may also be developed as new avian deterrent technology and information become available.

Some impacts resulting from avian use of the evaporation ponds may be better mitigated using the adaptive management approach described in Section 7.0. Whether an impact warrants mitigation requiring implementation of adaptive management actions would be determined collaboratively among TSE and the USFWS, NDOW, and BLM. Several factors would be considered when making the determination, such as the avian or bat species impacted, whether that species is listed as threatened or endangered, the rarity of the species, the effects to the population level of that species, whether previous mortality of the species has been reported at the ponds, and total mortality of all species reported at the evaporation ponds.

Continued post-construction mortality monitoring at the evaporation ponds would reveal if these adaptive management techniques have been successful in minimizing mortality as intended. The success of the techniques shall be determined through consultation among the USFWS, NDOW, and BLM, in collaboration with TSE. Should, through this consultation, after all other adaptive management techniques are exhausted, it be determined that impacts resulting from the evaporation ponds remain unacceptable, netting would be installed on one or more of the ponds. The ponds would be initially designed with adequate spacing for the installation of net support structures and cable tie downs so that netting could be installed while allowing the ponds to function as a means of evaporation. However, this measure would be implemented only as a last and final resort if avian and or bat mortality could not be controlled with other adaptive management techniques.

7.0 Implementation and Adaptive Management Actions

7.1 TONOPAH SOLAR ENERGY POLICY

TSE would voluntarily adopt and implement the avian and bat protection measures as described in this ABPP to reduce the potential for mortality that could result from electrocution, collision, burning from concentrated heat, saline toxicity, and drowning in evaporation pond water.

7.2 AVOIDANCE AND MINIMIZATION

TSE has agreed to several measures to avoid and minimize impacts to avian and bat species during project construction and operation that are discussed in Section 6 of this document. Lighting would be controlled on the central receiving tower to minimize the potential for avian and bat collisions. Transmission lines and power poles would be constructed to APLIC standards which would minimize impacts to avian and bat species in the project area. Evaporation ponds would be constructed in a manner to discourage wading. Anti-perching devices would be installed at evaporation ponds, and visual deterrents would be installed.

In order to minimize impacts to migratory birds during initial construction activities, TSE would avoid land-clearing activities such as vegetation removal during the avian breeding season (April 1 to August 31). These dates may be modified by BLM based on specific site and weather conditions. If land-clearing activities take place during the avian breeding season, a qualified biologist would conduct preconstruction surveys in the affected area to identify nests and breeding birds. If active nests were located, then a protective buffer zone would be delineated around the area (approximately 100 feet) and land-clearing activities would be restricted within this buffer zone (BLM 2010a).

During project operations, vehicles would travel on project roads to minimize destruction of the native habitat in the project area, which would minimize habitat impacts and crushing of avian and bat species during project-related activities.

7.3 ASSESSMENT AND IMPLEMENTATION APPROACHES

7.3.1 Reactive Approach

The reactive approach would include implementation of adaptive management actions after avian or bat mortality has occurred. As incidents occur, TSE would respond appropriately through documentation via the Avian Reporting System (see Section 8.0). The post-construction monitoring procedures described in Section9.0 would also report and record mortality impacts resulting among avian and bat species interacting with the project facilities. These reports would be provided to the USFWS, NDOW, and BLM. The reported mortality impacts would be assessed by the three agencies in collaboration with TSE to determine whether the impact justifies mitigation by implementation of adaptive management actions. This determination would include several factors, including such factors as the avian or bat species impacted, whether that species is listed as threatened or endangered, the rarity of the species, the effects on the population level of that species, and consideration of previous mortality resulting to that species at the project site, or as a result of interaction with that project facility. Adaptive management actions would be developed based on many of these same factors. The development of specific adaptive management actions would occur collaboratively among the USFWS, NDOW, BLM, and TSE, and would be based on scientific data, effective actions implemented at similar projects, new

technology developed during the life of the project, and other similar or related information. Continued post-construction at the evaporation ponds would reveal if these adaptive management techniques have been successful in minimizing mortality as intended. The success of the techniques shall be determined collaboratively as well.

Not all impacts would warrant implementation of adaptive management techniques, such as reducing avian mortality at the evaporation ponds by implementing various avian deterrent devices at the ponds according to species and seasons. Although the mortality of a bat or bird or several bats and birds would occur for a reactive measure to be implemented, the population benefits through minimization or removal of the risk originally causing the mortality.

7.3.2 Preventative Approach

Preventative measures would include all of the initial protection measures described in this document that would be constructed into the project components in order to minimize mortality, such as anti-perching devices around the perimeter of the evaporation ponds or raptor-safe power poles and transmission lines. Preventative measures attempt to avert potential bat and avian mortality before the potential becomes reality. Effective preventative measures can help prevent possible violations of the MBTA, ESA and BGEPA.

Preventative measures also include mitigation measures implemented to minimize or eliminate the potential for avian mortality resulting from non-operational risks associated with the project, such as construction impacts. Appendix B contains several of the mitigation measures that TSE would implement for non-operational impacts.

7.4 PERMIT COMPLIANCE

There may be situations where TSE finds it necessary to obtain additional federal and state permits regarding avian or bat species as it relates to mortality and to avian nest removal and relocation. These could include incidental take permits, collection or salvage permits, and nest removal and relocation permits. In such a situation, TSE would work with the federal and state resource agencies listed in Section 7.10, Key Resources, to determine which permits are necessary and to acquire relevant permit applications. Under no circumstances would TSE perform any activity requiring a permit without first obtaining the proper permit or authorization to do so.

7.5 PERSONNEL TRAINING

In order to effectively implement the ABPP, TSE would ensure that all appropriate personnel (Facilities Maintenance Department, Resident Officer in Charge of Construction, etc.) undergo training on the issues and protocols outlined in the ABPP. This training would ensure that all appropriate personnel have a thorough understanding of the ABPP and their responsibility to avian and bat protection and regulatory compliance.

7.6 AVIAN AND BAT ENHANCEMENT OPTIONS

TSE would continue to protect natural resources and promote actions that benefit local and regional bird and bat populations. TSE would limit project disturbance to the area within the perimeter fence to the extent possible, thus maintaining local vegetation outside of the project perimeter fence that would maintain nearby nesting and foraging habitat for avian and bat species. TSE would avoid construction of new roads, and if necessary, new roads outside of the perimeter fence would be kept to a minimum.

In addition to enhancing habitat, TSE would install anti-perching guards on power poles outside of the project fence perimeter. Anti-perching guards would enhance the overall safety of the immediate habitat area. Based on agency consultation and approval, nesting platforms or nesting boxes could be constructed by TSE at a future date. Such construction would depend on future observations and monitoring data during operation of the facility, and would be coordinated with the USFWS, BLM, and NDOW.

7.7 NOISE EMISSIONS

Anthropogenic noise has generally been found to have negative effects on various avian species. With the exception of occasional motorized travel on existing roads in the area, the existing ambient noise in the vicinity of the project facility is free of anthropogenic noise. Ambient noise would generally be attributed to natural sources, predominantly wind. Wind blowing over grass and brush is reported to generate a noise level of 30 decibels (Kariel 1991).

Operation of the project facility would introduce anthropogenic noise to the area. The project facility would be operated in conformance with the OSHA standards for occupational noise standards (29 CFR 1910.95). Pursuant with the standard, a time-weighted average sound level (TWA) of 85 decibels or less would be maintained at the project facility. The power block would be the only source of consistent and regular anthropogenic noise that approaches the 85 decibel level. The power block is located near the center of the heliostat field and is separated by a distance of 3,800 feet from the project perimeter fence, which is where the nearest avian habitat would be located. Although several factors can alter the rate at which noise attenuates, including atmospheric absorption, scattering, and boundary interference, noise generally attenuates at a rate of 6 decibels each time the distance from the noise source is doubled (Crocker 2007). Applied to the project, the anthropogenic noise of 85 decibels at the power block would be reduced to approximately 25 decibels at 3,800 feet away. Noise of 25 decibels is comparable to a whisper (Olishifski and Harford 1975) and is less than the estimated ambient noise of the existing environment (30 decibels). Other noise sources associated with the project would occur infrequently and would be temporary, including occasional use of vehicles or water pumps at the evaporation ponds. Therefore, anthropogenic noise would not be expected to have negative impacts to avian species.

If operations later require a source of anthropogenic noise to be placed within a distance of avian habitat that would substantially increase the existing ambient noise level at that habitat, the source would be fitted with sound muffling devices or similar mechanisms to reduce noise emissions to the extent practicable.

7.8 QUALITY CONTROL

Periodically, TSE would assess various parameters and protection measures as described in the current ABPP to ensure that it is as efficient and effective as possible. Parameters that TSE would assess periodically include:

- assessing remedial action techniques through follow-up surveys to evaluate their effectiveness in reducing avian and bat mortality;
- assessing avian and bat protection devices to identify products preferred for avian and bat protection as well as ease of application and durability;
- assessing mortality reporting procedures to ensure that discoveries of avian mortalities are properly documented;
- assessing response to avian mortalities to ensure that appropriate actions are taken in a timely manner;
- assessing compliance with company procedures to ensure that personnel are consistently following company methods for avian- and bat-safe construction, mortality reporting, nest management, etc.; and,
- assessing public and agency opinions on system reliability and avian protection.

These parameters would be assessed during each periodic review of the ABPP if necessary or if appropriate for that period. Additional parameters other than those listed above may be assessed during review of the ABPP if determined necessary by TSE. Although it is only practical to periodically revise or update the ABPP, the quality control component would be an ongoing process. Daily observations, internal operating procedures, personnel input, and new technologies would be applied to assessments during the periodic reviews of the ABPP. Revisions and updates to the ABPP would be made in consultation with the USFWS, BLM, and NDOW. Revisions and updates to the ABPP would be addressed with personnel at the project area.

7.9 PUBLIC AWARENESS

A public awareness program can be an integral part of an APP. This program can be used to enhance general public awareness and support for a project's APP. It allows stakeholders such as government agencies, Tribes, non-profit organizations, wildlife rehabilitators, and other interested parties an opportunity to provide input to the decision-making process, enabling all parties to work openly and collaboratively toward recommendations that can be effectively implemented. This collaboration often leads to improved relationships within the community and to more efficient and positive projects. The relationships developed through this process may also encourage the public to report bird and bat mortalities and encourage them to seek assistance for birds and bats that have been injured in power line related accidents (APLIC and USFWS 2005).

TSE would include avian and bat protection in its ongoing public awareness campaign. Ongoing public awareness would include TSE's cooperative and innovative efforts to minimize avian and bat mortality, effectiveness of the ABPP, and ongoing monitoring to detect problem areas. Public awareness may be made available through brochures, websites, advertisements, or other media.

7.10 KEY RESOURCES

TSE will consult with the following key resources to assist in providing expertise in permitting, bird and bat populations and behavior, and avian- and bat-safe design features.

- U.S. Fish and Wildlife Service
- Nevada Department of Wildlife
- The Bureau of Land Management
- Nevada Natural Heritage Program
- Great Basin Bird Observatory
- Western Bat Working Group
- Nevada Bat Working Group
- Edison Electric Institute
- Avian Power Line Interaction Committee

These resources will be utilized as necessary and will further ensure that TSE has a successful and effective ABPP. Resources other than those listed may also be consulted, including consultants, company specialists, and other solar energy facilities with proven effective avian and bat protection programs.

8.0 Avian and Bat Reporting System

8.1 Purpose of the Avian and Bat Reporting System

In order to assess the effectiveness of the ABPP and prioritize avian and bat protection needs, TSE would report, monitor, and manage all bat and avian injury or mortality in accordance with the methodology below. All appropriate TSE personnel, including managers, supervisors, line crews, and engineers would be provided with instruction on implementing the methodology and properly reporting bat and avian mortality. The reporting of avian and bat mortality would be standard practice by TSE for the duration of the operation of the project. The reporting of avian mortality from electrocution with transmission structures would also allow the development of measures to reduce potential power outages resulting from avian conflicts. Reporting of avian nesting sites would also be performed according to the methodology below.

8.2 Avian Reporting System Components

8.2.1 Detection

Avian and bat injury or mortality would be detected through investigation of avian- or bat-caused power outages, through monitoring efforts during operation, and through incidental observations by TSE personnel or others. To improve the probability that birds or bats that have suffered injury or death do not go undetected, TSE field staff would be directed to remain alert for birds and bats within the project area and near the project area. The detection of avian nest sites would occur through monitoring efforts during operation and through incidental observations.

8.2.2 Response and Documentation to Injured, Deceased, and Nesting Birds

In the event that an avian or bat injury or mortality is detected through monitoring efforts or incidental observations, TSE personnel would record the circumstances and conditions associated with the death or injury. Among the information recorded would be the date and time that the bird or bat was detected, the location where the bird or bat was detected, the apparent cause of injury or mortality, and if possible, the species of the bird or bat. TSE personnel would be provided with a standardized Avian Incident Form for recording the necessary information when an incident is detected. An example form is provided in Appendix A.

TSE would perform a site assessment in response to any power outage that may occur in order to determine the cause and circumstances resulting in the outage. If it is determined that the power outage is related to avian interaction with the utility system, TSE would record the pertinent avian information using the standardized Avian Incident Form in Appendix A. Assuming the bird causing the outage suffers mortality from the incident, the information recorded would include the species of the bird, the nearest power pole number if applicable, the specific cause of the fatality if possible, and as much other relevant data as possible. Photographs of the bird carcass would be taken to accompany the standard reporting form if possible. It is unlikely that bat species would be capable of causing a power outage due to the lack of system damage that would be sustained from these smaller sized mammals colliding with utility facilities.

In the event that an avian nesting site is observed through monitoring or incidental observations within the project area, TSE personnel would record the circumstances and conditions associated with the nest site and nest. The recorded information would be used to determine if the nest and its locations present risk of injury or mortality to the nesting birds, and if the nest presents risk to the functionality of the solar project.

8.2.3 Remedial Action

While there are no legal provisions for an unauthorized take of protected species, the USFWS recognizes that some avian species may be killed even after all reasonable measures to avoid a take are implemented. Based upon the information gathered from site investigations and reported on Avian Incident Forms, TSE would determine whether implementation of remedial protection measures is substantiated. This determination would be dependent on the frequency of incident occurrences at a particular utility facility, the species that suffered mortality, the likely effectiveness of remedial actions, and agency input and guidance. Likewise, these same factors would determine what types of remedial protection measures and practices TSE would implement if such measures are determined necessary.

8.2.4 Reporting

TSE's Environmental Representative would complete and submit an Avian Incident Form (Appendix A) during, or immediately following the site investigation for future risk assessment. Although this form would be for internal submittal, it would be used for mortality monitoring studies at the site and would be available to regulatory agencies should data be requested. TSE's Environmental Representative would also complete the USFWS's online "Bird Fatality/Injury Report", an online database of voluntarily submitted incidents of bird mortalities and injuries resulting from electrocutions or collisions with utility structures. The intent of the database is to gain information that can be used to prevent future avian mortality.

Mortality of a bald or golden eagle would be immediately reported to the USFWS, BLM, and NDOW. Any other avian nesting or avian and bat mortality data reported in the area by persons not employed by TSE would be recorded by TSE in the USFWS online database as well.

8.2.5 Disposal Procedures for Injured, Deceased, and Nesting Birds

The USFWS issues permits to take, possess, or transport bald and golden eagles under the BGEPA. Considering that mortality of a golden or bald eagle is unlikely to result from the project, especially after implementation of the mitigation measures described in this ABPP, the need for a take permit under the BGEPA is not warranted at this time. TSE personnel are strictly prohibited from handling, transporting, or disposing of a golden or bald eagle carcass without a take permit issued under the BGEPA. As a result, in the unlikely event that such mortality does occur, TSE would contact the USFWS immediately to report the incident and arrange for retrieval and receipt of the carcass. The BLM would also be notified of the mortality. In the event that an eagle mortality occurs, TSE would conduct a Resource Equivalency Analysis (REA) and meet with the agencies to determine appropriate compensatory mitigation and to determine if further avoidance measures should be implemented.

Under the MBTA, it is unlawful to collect, salvage, or otherwise have in possession any raptor or raptor

part, including feathers, without a state and federal permit. Most other avian species with potential to occur in the project area, including those that are not raptors, would be protected under the MBTA as well. There may be occasion however, for TSE or appointed biologists to collect bird carcasses in order to determine the cause of death, for disposal purposes, for temporary collection for onsite inspection, or for extraction from electrical components. If such occasion becomes necessary, TSE would coordinate with the USFWS, BLM, and NDOW to determine the need for a permit and, if necessary, would apply for permits to allow the handling of dead and injured birds. TSE would immediately notify the USFWS and the NDOW regarding any apparent injury or death occurring to an eagle during project activities. TSE would ensure that any injured eagle would be immediately transported to the nearest federally permitted eagle rehabilitator. Dead eagles will be reported to the USFWS Division of Migratory Bird Management and Law Enforcement within 24 hours and shipped to the eagle repository in Colorado. A Migratory Bird Salvage permit maybe required. When Programmatic Eagle Permits (take permits) become available, the salvage and shipment of eagles would be included in the permit and could be handled by TSE or appointed biologists.

The protected bat species with potential to occur in the project area are considered BLM sensitive species in the state of Nevada. Several of the species are also classified as protected by the state of Nevada. In the event that a bat sustains injury or experience death from interaction with utility facilities, TSE or TSE appointed biologists may need to handle, transport, or dispose of protected-bat carcasses. If the need for such actions becomes apparent, TSE would coordinate with the BLM and NDOW to ensure that all necessary permits are obtained and that all activities are in accordance with applicable regulations and laws.

9.0 Mortality and Monitoring Studies and Mitigation

9.1 GOALS AND OBJECTIVES

The primary goal of the post-construction monitoring program is to ensure that the adaptive management approach is as successful as possible at minimizing the potential for avian and bat mortality sustained from interactions with the project facilities during operations. In order to accomplish this goal, it is critical that an estimate of the impacts of the project facility to avian and bat species is obtained regularly. This would ensure that the adaptive management actions that have been implemented are routinely assessed for effectiveness and that avian and bat mortality remain minimized. To facilitate this, the objective of the post-construction monitoring program is to:

- estimate direct impacts to birds and bats in terms of mortality resulting from operation of the project facilities;
- assess avian and bat utilization of the project facilities and areas under or immediately adjacent to the project facilities; and,
- estimate the success of adaptive management actions that have been implemented to minimize avian and bat mortality and, if necessary, identify other actions to implement.

Since solar energy technology is rapidly developing, monitoring methods are constantly improving as researchers develop new and more accurate methods of survey and mitigation techniques. TSE will consider refinement of monitoring methods and mitigation practices described below and adoption of new survey techniques or protocols as they become available. Refinement of the monitoring program may also occur through consultation with the USFWS, BLM, and/or NDOW. The monitoring program may be adjusted to include additional objectives as determined necessary during implementation and practice, or through consultation with the USFWS, BLM, and/or NDOW.

9.2 POST-CONSTRUCTION MONITORING COMPONENTS

Post-construction monitoring protocols follow *Monitoring Migratory Bird Take at Solar Power Facilities: An Experimental Approach*, USFWS, April 26, 2011, and ensure that monitoring includes all aspects of the project including the central receiving tower and heliostat field, the transmission lines and power poles, and the evaporation ponds. Post-construction monitoring protocols for the evaporation ponds also follow the requirements identified in the Industrial Artificial Pond Permit issued by NDOW for the Crescent Dunes Solar Energy Project (NDOW 2011).

9.2.1 Methods

9.2.1.1 Intensity of Mortalities

TSE would provide data from initial studies controlling for detection rate, method of mortality, scavenging rate, and locations of mortality. There is the potential in the future to adapt monitoring protocols for the project based on these initial studies to set forth the monitoring effort (USFWS 2011).

9.2.1.2 Detection Rate

Data from initial studies would include the detection rate as a function of distance from established

transect lines. This would allow TSE to help develop future protocols and set distances from transect lines to monitor mortalities (USFWS 2011).

9.2.1.3 Method of Mortalities

TSE would provide data from initial studies. Descriptions of found mortalities and location within the project area would aid in this assessment. These initial studies would identify where in the solar development mortalities occur and direct future efforts to reduce take resulting from specific causes (USFWS 2011).

9.2.2 Considerations

Capture/recapture would be used to estimate the abundance of dead migratory birds, considering variation in frequency of carcasses that may vary over time and location across and within transects and considering scavenging rates that may vary over time and location across and within transects (USFWS 2011).

9.2.3 Sampling Design

9.2.3.1 Strata

The following three strata are included in this design: (1) within the mirror array and central tower (for power tower developments); (2) ponds; and (3) along transmission lines (USFWS 2011).

9.2.3.2 Transects

Transects are used as replicates within strata. Transects should cover 10 to 30 percent of the stratum area. Coordinates for transect lines should be established. Then sampled areas would be extrapolated to the overall area within each stratum (USFWS 2011).

9.3 TRANSECT LAYOUT

Within the mirror array and central receiving tower (for power tower developments), mirror or photovoltaic cells typically are created in a circular or tetragon shape. Given the difference in these developments, there are two different approaches to laying out transects. Transect design should result in 10 to 30 percent of the total area coverage within the stratum. A minimum of eight transects should occur within this stratum to obtain good replication and enough data to test for effects of distance on mortality events (USFWS 2011).

9.3.1 Central Receiving Tower and Heliostat Solar Field

Transect layout in a power tower array (typically circular) encompasses the 360 degree area surrounding the central tower (Figure 1). Carcasses are considered to be detected randomly throughout the mirror array. Eight transects which originate at the central tower and extend to the edge of the mirror array should be sampled. These transects shall be at every 45 degrees, which should result in 10 to 30 percent coverage (USFWS 2011).

9.3.2 Transmission Lines and Power Poles

The overall length of the sampled transmission line should be determined, and transects should be

randomly assigned to result in 10 to 30 percent coverage. Transects should run down the middle of the transmission lines. A minimum of four transects should be performed in this stratum (USFWS 2011).

9.3.3 Evaporation Ponds

Transect lines should be placed randomly along the immediate edges of ponds (Figure 1) to monitor floating or pulled-out carcasses. One transect should occur for each cardinal direction (i.e., north side, south side, east side, and west side) within this stratum due to the effects of wind or current. If multiple ponds occur, efforts should be made to sample each pond with at least one transect. There should be a minimum of four transects in this stratum (USFWS 2011). In addition to the transect surveys, monitoring of the evaporation ponds would occur not less than weekly and a log of monitoring efforts would be maintained in compliance with the NDOW Industrial Artificial Pond Permit (NDOW 2011). Monitoring would be performed by TSE staff. Also in compliance with the Industrial Artificial Pond Permit, water quality parameters of Total Dissolved Solids (TDS) and pH will be monitored on a quarterly basis at all ponds.

Figure 1. Typical Footprint for a Circular Solar Facility

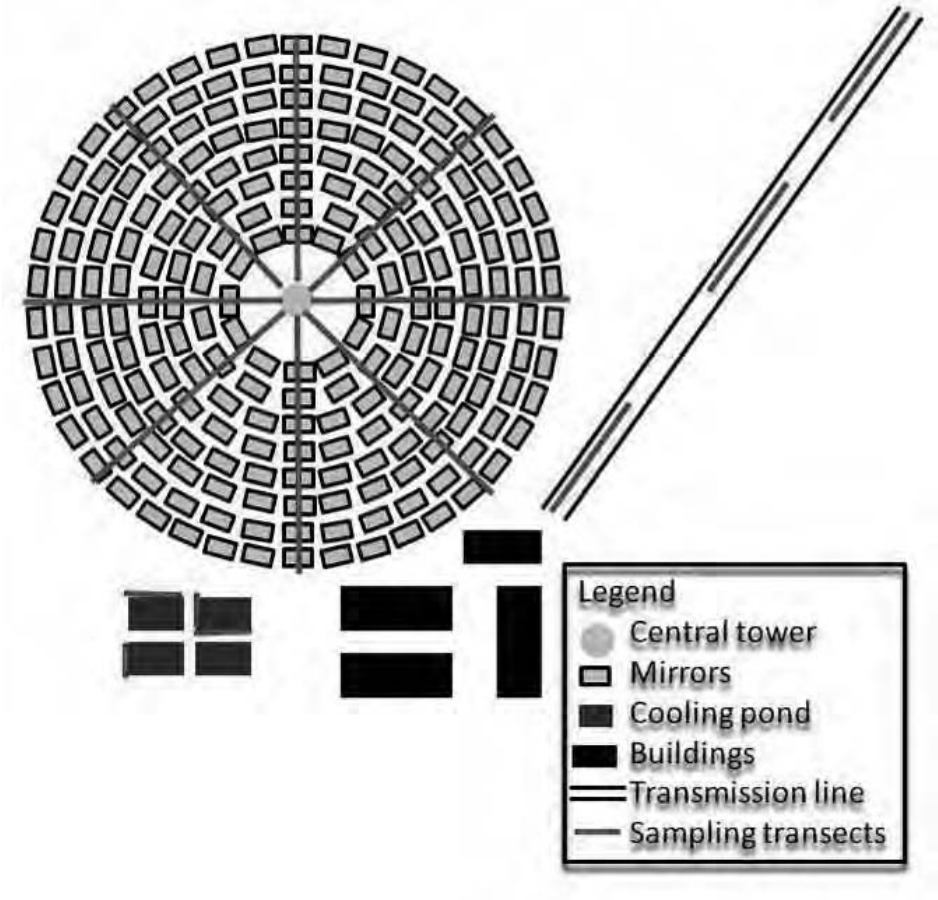

Figure 1 is a general diagram showing a typical footprint for a circular solar facility with a central power tower. Included is an approximation of the layout for transects to estimate migratory bird mortality.

For solar facilities in a tetragon shape, transects should be modified to run in a parallel fashion across the array.

9.4 SAMPLING ALONG TRANSECTS

Use of a single qualified observer is preferred. The observer would walk along pre-determined transects searching for bird carcasses, scanning away from the transect. When a carcass is observed, the observer should walk the shortest distance to the carcass. At each discovery of a carcass, a GPS location (UTM) would be recorded, the species would be identified, and information regarding carcass condition would be collected. Each carcass (not the location) would be uniquely and inconspicuously marked with tape and permanent marker. By recording UTMs, distances from the transect can be calculated for analysis in Program DISTANCE. All carcasses would be left exactly as found. By marking carcasses, future encounters would be used as recaptures. Once data are collected at a carcass, the observer would return to the pre-determined transect and continue with the survey. All sampling periods would be seven consecutive days. Observers would continue to record the presence, location (UTM), and condition of all observed carcasses. A sample data sheet is included in Appendix A. Carcasses would be

assigned to one of the following four classes at each encounter: (1) fresh (eyes are still wet and not totally sunk into sockets); (2) medium (eyes are totally sunk into sockets and breast muscle and viscera are still present); (3) non-scavenged carcass (a stiff carcass consisting of a dried complete carcass); or (4) remnant (a dried carcass consisting of non-edible parts). Additionally, the presence or absence of evidence of superheating (singed feathers) should be recorded (USFWS 2011).

9.5 DATA TO BE PROVIDED

The USFWS has a definitive interest in the analysis of the data and the results. Shapefiles showing the solar development including each mirror, tower, building, road, transmission line, and cooling pond are to be provided to the USFWS, as well as separate shapefiles showing all transects. Completed data sheets, or copies of them, also should be provided to the USFWS (USFWS 2011).

9.6 ANALYSIS

Two primary analyses would be conducted. The first would use Program DISTANCE to determine the most effective transect width to search for carcasses. The second would use Program MARK to estimate the total number of mortalities controlling for detection rate, scavenging rate, and proximity to the power tower (USFWS 2011).

9.6.1 Program DISTANCE

The preliminary analyses would benefit from the use of Program DISTANCE to determine the distance from established transects and which detection probabilities remain greater than 0.95. ARC GIS can use shapefiles containing the transect routes and separate shapefiles identifying the locations of carcasses to develop distances from the transect in which carcasses were detected. This initial analysis would develop protocols in which to sample along transects and whether a set transect width should be implemented in future surveys (USFWS 2011).

9.6.2 Program MARK

A suggested analysis would use the closed captures design within Program MARK to estimate the number of dead birds in the sampled area (10 to 30 percent of total area). This approach would allow the estimation of the number of dead birds, apparent survival to be the inverse of scavenging rate, and capture probability to be the observer detection rate; therefore, the estimate of the number of carcasses would include variation in scavenger and detection rate. The estimate of number of carcasses would be extrapolated to the full area within each stratum and would be summed to provide an estimate of total number of carcasses for the facility.

Consideration of multiple models would allow determination of source of mortality (e.g., central tower (models including distance from tower is selected); USFWS 2011).

9.7 ADAPTIVE STRUCTURE

Initially, all transects would be sampled for seven consecutive days at the beginning of each month for a year. We suggest that this year-round monitoring program be initiated at the beginning of the most active migratory period for the area. Analyses should be updated seasonally (every three months). At the end of the first year, the extrapolated full-year estimate of number of bird mortalities would be

considered for future refinement of monitoring protocol.

9.8 MITIGATION

Specific mitigation measures for impacts to avian and bat species from the project have not been specified; however, the USFWS would contribute to accessing site-specific mitigation.

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Appendix A

Avian Incident and Nest Assessment Forms

SAMPLE DATA SHEET (Excel file is available)

XXX Solar Facility Migratory Bird Monitoring Project

Date:

(use a different sheet for each day)

Observer:

Transect #	Unique Carcass ID	Species	Carcass Condition	UTM	Cause of Death		Transect #	Unique Carcass ID	Species	Carcass Condition	UTM	Cause of Death

Daily Summary

Transect	Total Number of carcasses (include zeros for transects with no carcasses; put X if not sampled)	Transect	Total Number of carcasses (include zeros for transects with no carcasses; put X if not sampled)
Mirror 1		Pond 1	
Mirror 2		Pond 2	
Mirror 3		Pond 3	
Mirror 4		Pond 4	
Mirror 5		Line 1	
Mirror 6		Line 2	
Mirror 7		Line 3	
Mirror 8		Line 4	

Appendix B

Partial List of Avoidance and Minimization Measures for Non-Operational Impacts

Pre-Construction Migratory Bird Nesting Surveys

- All ground-disturbing activities will be conducted outside the migratory bird nesting season (March 15 – July 31). If ground-disturbing activities cannot be avoided during this time period, pre-construction nest surveys shall be conducted by a BLM-approved biological monitor with the following guidelines:

- For raptors specifically, the holder will use the USFWS Utah Field Office Guidelines for Raptor Protection from Human and Land Use Disturbances (1999) to determine appropriate survey areas and disturbance buffers for active nests.

- For all non-raptor bird species, surveys shall cover all potential nesting habitat in and within 300 feet of the area to be disturbed.

- Surveys must be conducted between sunrise and 3 hours post-sunrise when birds are most active.

- Because there are no standardized disturbance buffers for active non-raptor bird nests, if active nests are detected, a no-disturbance buffer zone (as determined by USFWS, NDOW, and BLM) will be established. Nest locations shall be mapped and submitted to the BLM as needed.

- Active bird nests will not be moved during the breeding season unless the holder is expressly permitted to do so by the USFWS, BLM, and NDOW.

- All active nests and disturbance or harm to active nests will be reported within 24 hours to the USFWS, the BLM, and NDOW upon detection. The biological monitor will halt work if it is determined that active nests are being disturbed by construction activities, until further direction or approval to work is obtained from the appropriate agencies.

Golden Eagle Nest Monitoring

- Nest monitoring will be performed in accordance with the *Interim golden eagle inventory and monitoring protocols; and other recommendations* (Pagel et al 2010).

- Monitoring of the known golden eagle nest will be required during construction and at least five (5) years post-construction.

- Monitoring can and should be done from the main road.

- At least two (2) observation periods per season shall be completed between March and June. Observation periods will last at least four (4) hours, or until nest occupancy can be confirmed. Observation periods will be at least 30 days apart.

- Surveyors need to be experienced with raptor identification and survey techniques. A report of

findings should be submitted to Tonopah Solar Energy, NDOW, and the BLM that includes dates, times, species seen, activity, etc.

Appendix C

Evaporation Pond Operations Discussion

EVAPORATION POND OPERATIONS

INTRODUCTION

An Operations Plan is required for the three evaporation ponds at the Crescent Dunes Solar Energy Project to ensure the operational personnel are aware of the evaporation pond design features and operational techniques required to maximize evaporation and protect avian and bat species. Operational features of the evaporation ponds and potential operational methods that can be implemented to decrease the risks associated with the ponds on avian and bat species are outlined below.

The evaporation ponds are designed to contain 3 feet of evaporative residue, 3 feet of wastewater and a minimum of 3 feet of freeboard. However the depth of evaporative residue and wastewater in each pond is determined by the volume of wastewater pumped into each pond, chemistry of the wastewater discharged into the ponds, chemical and biological processes occurring within the ponds, and the weather (evaporation potential). Generally, the wastewater in the evaporation ponds will be a brine solution with the salt acting as the primary solute and water acting as the primary solvent. As the wastewater levels increase, the concentration of salt decreases due to the dilution, alternatively, as the wastewater levels decrease, the salinity increases.

Avian and bat species may be effected if there are high concentrations of total dissolved solids (TDS) in the wastewater. The ponds are not covered by netting to prevent entanglement or trapping of avian and bat species.

The following components need to be balanced to managing the evaporation ponds:

- Depth of wastewater
- Concentrations of TDS in the wastewater
- Temperature of the wastewater
- Visual monitoring

The following sections outline the operational procedures of each component.

DEPTH OF WASTEWATER

To keep the concentrations of TDS as low as possible, the following operational procedure has been designed on basis that there must be a depth of between 1 to 3 feet of wastewater in each operating evaporation pond:

- At the commencement of operation of the Crescent Dunes Solar Energy Project, only one evaporation pond is to be used (“Pond A”). Wastewater will be discharged into

Pond A only until it contains three feet of wastewater. This may take several months, depending on what time of year operation commences and the monthly evaporation rate. The other two evaporation ponds ("Pond B" and "Pond C") are to remain empty.

- When Pond A reaches capacity (3 feet of wastewater), 1 foot of wastewater will be pumped into Pond B, then Pond B used solely for the discharge of wastewater, and the wastewater in Pond A allowed to evaporate.
- When either Pond B reaches capacity (3 feet of wastewater), or there is less than 1 foot (12 inches) of wastewater remaining in Pond A, one of the following practices must occur:
    - Pond A will receive the ongoing discharge of wastewater from the plant (as long as there is more than 12 inches of wastewater remaining in Pond B);
    - Excess wastewater from Pond B will be pumped into Pond A (as long as there is more than 12 inches of water remaining in Pond B after the transfer of wastewater) and either Pond B or Pond A receives ongoing discharge of wastewater from the plant;
    - ALL of the wastewater from Pond A will be pumped into Pond B and Pond B will continue to receive the ongoing discharge of wastewater from the plant. This operation may be used (dry out a particular pond) if excessive evaporative residue has developed and must be removed.
- If Pond A and Pond B both reach capacity (3 feet of wastewater each), Pond C will be activated, with 1 foot of wastewater pumped into Pond C from either Pond A or Pond B, and then Pond C operated until either Pond A or Pond B evaporates down to only 12 inches of wastewater. At that point, wastewater will be pumped between the ponds to ensure each pond is either dry or contains more than 12 inches of wastewater.

This procedure of routing wastewater between the evaporation ponds to maintain wastewater levels will be up to the discretion of the Facility personnel. Each evaporation pond will be fitted with water level gauge which will be used to record the water level in each pond on a daily basis.

During the initial months of operation, there will be less that 12 inches of wastewater in Pond A, however the concentration of TDS is expected to be low and therefore the wastewater is expected to have minimal impacts on avian and bat species as there will have been no previous salt accumulation occurring in the ponds.

If required, the evaporation ponds can be fitted with evaporative spray nozzles during the life of the Project to accelerate evaporation rates to maintain the minimum freeboard requirements. This task would be undertaken at the discretion of the Facility Manager.

TDS CONCENTRATIONS IN WASTEWATER

The concentration of salt in the wastewater is dynamic, based on the concentration of constituents and chemical and physical processes occurring within the water body. Concentrations of total dissolved solids (TDS) in the wastewater may vary from approximately 11,000 ppm (estimated incoming TDS concentration) up to 250,000 to 300,000 ppm. Therefore a hydrometer will be installed at each active evaporation pond to gather daily data on the salinity. If there are any periods where high concentrations of TDS are recorded, then one of the two following procedures must occur:

- Pump wastewater from another operating pond(s) into the pond with the high TDS concentrations to allow for dilution; or
- Pump ALL the wastewater from the pond with high TDS concentrations into another operating pond(s), and allow the evaporative residue to solidify.

NOTE: The term "high concentrations of TDS" is considered a level of TDS in the wastewater that may cause health issues with birds that use the pond. This will be evaluated through monitoring of the evaporation ponds as outlined in the ABPP.

TEMPERATURE OF THE WASTEWATER

Salt crystallization is known to increase in cooler temperatures, particularly in temperatures of 4 degrees Celsius (39.2 degrees Fahrenheit) or lower. Each evaporation pond will be outfitted with a direct reading thermometer to record temperature data. The operational personal will monitor the temperature gauge, and if the average overnight water temperature in the active evaporation ponds is at or below 4 degrees Celsius, the following procedures will be implemented:

- Conduct a visual survey of the ponds the following morning to observe evidence of recent substantive increases in salt crystallization anywhere within the pond (e.g., at or near the waterline).
- If there are no signs of salt crystallization, then no further actions are required, however if there is evidence of salt crystallization, then one of the two following procedures will be undertaken:
    - Pump wastewater from another operating pond(s) into the pond with the evidence of salt crystallization to allow for dilution; or
    - Pump ALL the wastewater from the pond with evidence of salt crystallization into another operating pond(s), and allow the evaporative residue to solidify.

EVIDENCE OF WILDLIFE USE/MONITORING

The Facility will have an appointed biologist or Environmental Compliance Manager (ECM) to conduct avian monitoring at the evaporation ponds. Avian monitoring would be conducted in

accordance with the ABPP. The data collected (water level, water quality, and water temperature) can be used in conjunction with the monitoring to provide information to help plant personnel determine the best ways to operate the evaporation ponds to minimize impacts to avian and bat species.

The adaptive management technique(s) implemented will be dependent on the avian or bat species mitigation and the time of year mitigation is implemented (bird cannon would be used primarily during migration periods when waterfowl would have the greatest potential be present). The rate at which a particular management technique has been utilized would also be considered in order to prevent birds from becoming acclimated to the mitigation measure.

CONCLUSION

The main objectives of the operation procedures for the evaporation ponds is maintaining 3 feet of freeboard, whilst balancing the TDS concentrations by varying the depth of the wastewater, and monitoring the TDS concentrations and wastewater temperatures. The data from the daily measurements of water levels, salinity concentrations and temperatures will be kept on site and available to the personnel monitoring the evaporation ponds. The operating personnel will be required to assess all three components to ensure that the ponds are managed effectively while protecting avian and bat species.

ATTACHMENT 2

STORMWATER GENERAL PERMIT

ndep
NEVADA DIVISION OF ENVIRONMENTAL PROTECTION
protecting the future for generations

STATE OF NEVADA
Department of Conservation & Natural Resources
DIVISION OF ENVIRONMENTAL PROTECTION

Brian Sandoval, Governor
Leo M. Drozdoff, P.E., Director
Colleen Cripps, Ph.D., Administrator

7/1/2011

MR. ROB HOWE
TONOPAH SOLAR ENERGY LLC
2425 OLYMPIC BLVD STE 500 EAST
SANTA MONICA, CA 90404

Dear: MR. ROB HOWE

Re: Stormwater General Permit: NVR100000

Project ID Number: CSW-21953

Project Name: Tonopah Solar Energy LLC

Your submittal to be included under the Stormwater General Permit has been approved effective 07/01/2011 . Please note that by submitting an NOI the permittee has certified that the project's Storm Water Pollution Prevention Plan (SWPPP) has been completed, that the SWPPP will be updated as necessary, and that it will be maintained at the permitted site.

At the time of any on-site inspections, our inspectors will ask to review your copy of the SWPPP in an effort to ensure proper compliance with the program.

Also note that Nevada Administrative Code (NAC) 445A.268 Section (5)(b) reads, in part, that a Permittee (discharger) who is covered under a general permit shall pay to the Director a nonrefundable fee of $200 not later than July 1 of each year that the discharger is covered under that permit.

To Terminate coverage of the Nevada NPDES General Permit for Stormwater Discharges, the Permittee must submit a Notice of Termination ("NOT") form when their facilities no longer have any stormwater discharges associated with Construction activity as defined in the Nevada's General Stormwater Permit or EPA regulations at 40 CFR 122.26, or when they are no longer the operator of the site.

Should you have any questions, I can be reached at (775) 687-9434.

Sincerely,

Michele Reid
Environmental Scientist
Stormwater Program
Nevada Division of Environmental Protection

CC: Mr.Miguel Carlos Vinado Cobra Thermosolar Plants Inc 7380 W Sahara Ave Ste 160 Las Vegas NV 89117

TONOPAHSOLAR

PROJECT

cobra

Crescent Dunes Solar Energy Project

TITLE

StormWater Pollution Prevention Plan

PROJECT DOCUMENT Nº

CDS-ADM-PER-HGI-006

REV	**5**	ISSUED FOR	**Implementation**
DATE	**07/27/2011**		

Worley Parsons	**Harris Group Inc.**	**Cobra Thermosolar Plants Inc.**
PREPARED BY	CHECKED BY	APPROVED BY

cobra
Plantas Industriales

REVISION SUMMARY

Revision	Date	Description of the changes
0	04/11/2011	First issue. Review of adequacy by HGI
1	06/22/2011	NOI and Updated Contact Information included by CPI
2	07/15/2011	Attachment 1-Sediment Basin Sizing Revision by HGI
3	07/20/2011	Modifications requested by TSE done by CPI
4	07/22/2011	Power Block updated (Rev1) by CPI
5	07/27/2011	BLM comments incorporated by CPI

STORM WATER POLLUTION PREVENTION PLAN (SWPPP) FOR CONSTRUCTION ACTIVITIES

Project and Permitting Information

Project Name:	**Crescent Dunes Solar Energy Project**

Project Location:			
Street Address:	**BLM Land Along State Route 89, North of US Route 95/6**		
City:	**North of Tonopah**	**County:**	**Nye**
APN (at least one):	**(Township 5 North, Range 41 East, Section 34)**		

Permittee* Information:			
Company or Agency :	**COBRA THERMOSOLAR PLANTS, INC**		
Address:	**7380 West Sahara Ave, Suite 160**		
City, State, Zip:	**Las Vegas, NV 89117**		
Contact Person:	**Miguel Carlos Vinado**	**Phone :**	**702-493-7666**

Person Responsible for Implementing SWPPP:			
Name:	**Miguel Carlos Vinado**	**Phone :**	**702-493-7666**
Address:	**7380 West Sahara Ave, Suite 160**		
City, State, Zip:	**Las Vegas, NV 89117**		

Notice of Intent Filing Date:	**June 17, 2011**

* The Permittee is defined as the owner and/or operator of the construction site. This is the person that has operational control of the construction plans and specifications, or has day-to-day operational control of the activities necessary to ensure compliance with the SWPPP.

NOTES:

1. **A WORKING COPY OF THIS SWPPP MUST BE KEPT AT THE CONSTRUCTION SITE OR BE LOCALLY AVAILABLE FOR REVIEW BY NDEP AND LOCAL REGULATORY AGENCIES**

2. **THIS MODEL SWPPP TEMPLATE WAS DEVELOPED FOR COMPLIANCE WITH STORM WATER GENERAL PERMIT NVR100000, DATED SEPTEMBER 16, 2007. ALL SECTION NUMBERS REFERENCED IN THIS DOCUMENT REFER TO THE 2007 PERMIT. A COPY OF PERMIT NVR100000 MUST BE ATTACHED TO THIS DOCUMENT**

3. **GUIDANCE FOR SELECTING AND IMPLEMENTING BMPs IS AVAILABLE IN THE TRUCKEE MEADOWS CONSTRUCTION SITE BMP HANDBOOK.**

4. **ATTACH ADDITIONAL PAGES WHEN NECESSARY TO PROVIDE THE REQUIRED INFORMATION**

NOTICE OF INTENT

Re: Stormwater General Permit NVR100000
Confirmation Number: CSW- 21953
Project Name: TONOPAH SOLAR ENERGY, LLC
Date: 6/17/2011

Owner
TONOPAH SOLAR ENERGY, LLC
Mr. Rob Howe
2425 Olympic Blvd, Suite 500 East

Santa Monica, CA 90404-____

Operator
COBRA THERMOSOLAR PLANTS, INC.
Mr. Miguel Carlos Vinado
7380 West Sahara Avenue, Suite 160

Las Vegas, NV 89117-

Renewal: No *** If this is a Renewal Application, NO filing fee is required.**

Submission of this Electronic Notice of Intent constitutes notice that the Permittee identified in this request intends to be authorized by a National Pollutant Discharge Elimination System (NPDES) permit issued for storm water discharges in the State of Nevada and has or will comply with the following:

1. The Permittee will comply with all applicable permit conditions,
2. The Permittee understands that implementation of the Storm Water Pollution Prevention Plan, which is required under by the General Permit will begin at the time the permittee commences work on the project identified in Section I of this application,
3. The Permittee understands that failure to submit the required $200.00 fee and this signed Section Certification within 30 days of the electronic submittal will result in failure for eligible coverage under the General Permit; and,
4. That Nevada Administrative Code (NAC) 445A.268 Section (5)(b) reads, in part, that a Permittee (discharger) who is covered under a general permit shall pay to the Director a nonrefundable fee of $200 not later than July 1 of each year that the discharger is covered under that permit.
5. To Terminate coverage of the Nevada NPDES General Permit for Stormwater Discharges, the Permittee must submit a Notice of Termination ("NOT") form when their facilities no longer have any stormwater discharges associated with Construction activity as defined in the Nevada's General Stormwater Permit or EPA regulations at 40 CFR 122.26, or when they are no longer the operator of the site.

For Construction sites, elimination of all stormwater discharges associated with construction activity occurs when disturbed soils at the construction site have been finally stabilized and temporary erosion and sediment control measures have been removed or will be removed at an appropriate time. Final stabilization means that all soil-disturbing activities at the site have been completed, and that a uniform perennial vegetative cover with a density of 70% of the native cover for unpaved areas and areas not covered by permanent structures has been established, or equivalent permanent stabilization measures (such as the use of riprap, gabions, or geo-textiles) have been employed.

Please mail the filing fee of $200.00 along with this notice to:

Stormwater Coordinator 3173
Bureau of Water Pollution Control
Nevada Division of Environmental Protection
901 South Stewart Street, Suite 4001
Carson City, NV 89701-5249

Should you have any questions, please call Bonnie Hartley at (775) 687-9430.

NOI Certification Statement

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. I also confirm that a storm water pollution prevention plan (SWPPP) has been completed, will be maintained at the project site from the start of construction activities, and that the SWPPP will be compliant with any applicable local sediment and erosion control plans. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines for knowing violations.

Owner or Operator Name (Please Print): MIGUEL CARLOS VINADO

Signature (Please use a Non-Black Ink Color):

Table of Contents

ACRONYMS

BLM	**Bureau of Land Management**
BMPs	**Best Management Practices**
CDSEP	**Crescent Dunes Solar Energy Project**
CFR	**Code of Federal Regulations**
CSP	**Concentrating Solar Power**
lbs	**Pounds (weight)**
NDEP	**Nevada Division of Environmental Protection**
RECP	**Rolled Erosion Control Product**
SWPPP	**Stormwater Pollution Prevention Plan**
VDD	**Velocity Dissipation Device**

I. PROJECT DESCRIPTION

1.1. A. Description of the Proposed Construction Activity [§ III.A.1.f]

The Crescent Dunes Solar Energy Project (herein "CDSEP" or "Project") is a proposed Solar Thermal Power Generating Project to be built on Bureau of Land Management (BLM) managed land, approximately 15 miles northwest of the town of Tonopah, Nevada in Nye County, by Tonopah Solar Energy, LLC.

The proposed solar power project is based on concentrating solar power (CSP) technology with a nominal generating capacity of 110 megawatts (MW). 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 (liquid salt) is heated as it passes through the receiver and is 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. Thermal storage tanks will be used to store the hot and cold liquid salt. Other facilities to be constructed include transmission lines, access roads, support buildings and evaporation ponds.

Construction of the CDSEP, from site preparation and grading to commercial operation, is expected to take about 30 months, and 100 man-years of construction workers' time. The construction phases of the CDSEP as they pertain to stormwater management are expected to be as follows:

- **Site Disturbance (Clearing)** – The boundaries of the construction zone will be delineated and marked**.** Although the site currently contains very little vegetation, existing vegetation will be cleared within all areas being disturbed using a bush rake or equivalent, in order to separate the vegetation from the soil**.** Waste vegetation will be chipped and incorporated into the topsoil, and spread on disturbed areas that are not part of the permanent project or burnt.

- **Site Preparation** - A temporary staging area will be established including fenced parking (approximately 500 vehicles and construction equipment), covered trash disposal facilities, equipment/materials delivery and storage areas, concrete batch plant and washouts, construction trailers, laydown area, 10,000 gallon above ground storage tank for diesel supply within a containment area, and sufficient portable toilets and portable water for the construction staff and other identified Best Management Practices (BMPs) identified in this SWPPP.

- **Site Access –** Primary access to the CDSEP is from State Route 89, and access road beds will typically be 24 foot wide asphalt roads with 2 foot wide crushed rock shoulders. A stabilized entrance/exit will be provided to clean vehicle wheels prior to exiting the construction area.

- **Site Grading** – The existing site has a slope of approximately 2%, which is suitable for the construction of heliostats, therefore grading will only take place to maintain the minor slopes of the terrain. When light grading is needed (i.e. to create a smooth surface), only nominal cuts and fills will be undertaken (generally less than 6") and it will most likely be limited to the power block areas, receiving tower, access road and any associated roadside drainage ditches. High points (generally were wind blown sediment has accumulated to form 4" to 8" ridges) will be leveled, and slopes will be a maximum of 3H:1V (and flatter where possible) to allow vehicle access from and to road shoulders. The site will not generate excess soil or require import. Any topsoil that is encountered that is not suitable for structural fill will be stockpiled temporarily and reused in the disturbed areas outside of the permanent project facility (for example, the construction lay down and parking area).

- **Foundation –** All underground piping and wiring will be installed, followed by installation of the foundation for the new power blocks, solar towers and associated structures. Foundation construction will involved minor excavation (if necessary), form and rebar work preceding a number of concrete pours.

- **Power Plant Construction** – Activities include assembly and deployment of heliostats, construction of the power block (i.e. structural frames and buildings, installation of equipment including generators, condensers, pumps, buildings, cooling structure, storage tanks and central receiver tower) and evaporation ponds.

- **Site Stabilization –** All temporarily disturbed areas will be restored to their preconstruction conditions, as required by the BLM. 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 predominate surface soil is expected to be relatively well graded soil, sand and gravel, very similar to the existing surface conditions that currently exist on site. The power block area will be graded with moderate slopes to direct run off into the salt containment basin, allowing stormwater to infiltrate locally. The western areas of the site will contain a detention pond that will provide an area to allow sediment to be deposited and on-site stormwater controlled.

- **Demobilization –** All temporary construction facilities will be removed and the area re - contoured and re-vegetated as necessary.

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 will be obtained from a local borrow area, rather than within the project excavation. It is estimated that approximately 250,000 CY of material will be sourced from the borrow pit.

A new generator transmission tie line (gen-tie line) will be installed along the Anaconda-Moly Mine Access Road, parallel the existing Milers to Anaconda transmission line, to interconnect the CDSEP to the existing Sierra Pacific Power Company Anaconda-Moly Substation. The Anaconda-Moly Substation, located six miles due north of the CDSEP, will also be expanded to cater for the interconnection. Construction associated with the gen-tie line will occur along the existing Anaconda-Moly Mine Access Road and approved Right of Way (ROW) and include the following activities as they pertain to stormwater management:

- **Site Preparation** – Staging area to contain the materials for the transmission line (i.e. wooden posts for the wooden H-frame structures).

- **Pole Pads -** At each site, a temporary work area will be required for the structure location and access. The temporary work area will be cleared of vegetation only to the extent necessary for access and installation of the posts. A post will be placed approximately every 500 feet along the route, therefore estimated to be 70 sites.

- **Pole Erection –** An auger will be used to excavate the hole and the wooden posts would be installed in the holes, backfilled and compacted.

- **Cable –** Electrical cables will be pulled (strung) from structure to structure and tightened as necessary to achieve the required tension.

The expansion of the Anaconda-Moly Substation will include the following activities as they pertain to stormwater management:

- **Site Clearing and Grading** – Existing vegetation will be cleared within all areas being disturbed and minor grading undertaken to ensure consistent surface. A rock / aggregate material will be applied to the surface.

- **Substation Expansion** – additional substation equipment will be installed as well as a perimeter fence.

Total Area of Site (acres)	2,095 acres
Total Area to be disturbed by excavation, grading, or other construction activities including on and off-site borrow and fill areas (acres) [§ III.A.1.h]	CDSEP Site: • Permanent – 1,620 acres • Temporary – 52 acres Borrow Pit - 40 acres Gen-Tie Line: • Permanent (estimate 6 feet x 6 feet per site) – 0.06 acres • Temporary (estimate 100 feet by 10 feet per site) – 1.6 acres Substation Expansion – 1 acre

1.2. **B. Intended Sequence of Major Soil Disturbing Activities [§ III.A.1.g]** (include dates when these activities occur.)	
1.	**Start Construction & Mobilization – Month 1 (estimated August 2011 however this start date is subject to change)**
2.	**Install BMPs – Month 1 (estimated August 2011):** • **Delineate and mark the boundaries** • **Stabilize construction entrance/exit and roadway** • **Install tire wash** • **Establish parking and staging areas for vehicle and equipment storage, maintenance** • **Establish laydown area(s) for materials storage/staging** • **Establish concrete washout area** • **Install certified weed-free fiber rolls or silt fence at the base of slopes adjacent to delineated sensitive areas (i.e., wetlands), if any**
3.	**Clear and Grub (Strip topsoil) – Month 1 & 2 (estimated August to September 2011)**
4.	**Construct stormwater infiltration/evaporation area – Months 2 to 4 (estimated September to November 2011)**
5.	**Assemble and erect heliostats – Months 9 to 19 (estimated April 2012 to February 2013)**
6.	**Power block construction including sourcing aggregate from off-site borrow pit as necessary – Months 5 to 23 (estimated December 2011 to June 2013)**
7.	**Construct reinforced concrete foundations – Months 5 to 23 (estimated December 2011 to June 2013)**
8.	**Construct and install Gen-tie line – Months 11 to 17 (estimated June 2012 to December 2012)**
9.	**Expand Anaconda-Moly Substation – Months 14 to 20 (estimated September 2012 to March 2013)**
10.	**Construct administration/warehouse building – Months 19 to 21 (estimated February 2013 to April 2013)**
11.	**Final stabilization of site – Month 26 (estimated September 2013)**
12.	**Commissioning and testing – Months 26 to 30 (estimated September 2013 to January 2014)**

1.4. C. Existing Soil and Water Quality Data [§ III.A.1.i]

Provide a description of the existing soil and/or water quality data of any discharges from the site, if available. Water quality data for adjacent waterways that may receive discharges from the site is also recommended.

Under the United States Department of Agriculture (USDA) National Resources Conservation Service (NRCS) Hydrological Soils Group classification, approximately 1,290 acres on site is classified as Group A soils and the remaining 330 acres is classified as Group D. The gen-tie line and Anaconda-Moly Substation are also in the Group A soils classification.

The definition for Group A and D soils are as follows:

- *Group A – Low run off potential*. Soils having a high infiltration rates even when thoroughly wetted and consisting chiefly of deep, well drained sands or gravels. These soils have a high rate of water transmission.
- ***Group D – High run off potential*. Soils having very slow infiltration rates when thoroughly wetted and consisting chiefly of clay soils with high swelling potential, soils with a permanent high water table, soils with a claypan or clay layer at or near the surface, and shallow soils over nearly impervious material. These soils have a very slow rate of water transmission.**

No water quality samples taken from the CDSEP site pre-construction. There is limited development in the vicinity of the CDSEP which includes transportation routes, mines at least 4 miles northeast of the site, and the City of Tonopah approximately 15 miles southeast of the site. Typically, a majority of the stormwater run off infiltrates through the soils on site and into the groundwater basin rather than sheet flowing downstream and discharging into the surface water (Peavine Creek).

1.5. D. Runoff Coefficients [§ III.A.1.i].

Use the following worksheet for sites with only 1 or 2 land uses, such as an undeveloped site with a proposed parking lot. For sites with 3 or more land uses (pre and/or post-project) attach a separate worksheet.

1. Describe Pre-Project Conditions and Land Use(s)

The CDSEP is located on unincorporated lands administered by the BLM, under the jurisdiction of the BLM Tonopah Field Office. According to the Tonopah Resource Management Area offers a wide variety of recreational opportunities in the region, however this site is located in an area that is "Limited to Existing Roads and Closed to Competitive Events". Generally, the site (pre developed) is unused and comprised of low scrub vegetation.

Assumptions for Post-Development Calculation below –

- **In the Group A Soils area, the power block covers approximately 6 acres – assume that 3 acres is impervious (equipment and buildings).**
- **In the Group D Soils area, buildings cover approximately 3 acres.**
- **Remaining area in Group A and D soils are roads / heliostat field – assume minor increase in run-coefficient due to foundations and compaction by use.**
- **Gen-tie and Anaconda-Moly Substation expansion are not included in the runoff coefficient calculations as there is no expected change in pre to post project runoff coefficients.**

2. Pre-Project Land Use 1	**Coefficient**		**Acres (A1)**			**C1**
Undeveloped (Group A soils)	**0.2**	**x**	**1290**	**=**		**258**
3. Pre-Project Land Use 2	**Coefficient**		**Acres (A2)**			**C2**
Undeveloped (Group D soils)	**0.3**	**x**	**330**	**=**		**99**
4. Average Pre-Project Runoff Coefficient			**(C1 + C2) / (A1 + A2) =**			0.22
5. Post-Project Land Use 1	**Coefficient**		**Acres (A3)**			**C3**
Power Block / Buildings	**0.9**	**x**	**6**	**=**		**5.4**
6. Post -Project Land Use 2	**Coefficient**		**Acres (A4)**			**C4**
Heliostat Field & Other (Group A)	**0.25**	**x**	**1287**	**=**		**321.75**
7. Post -Project Land Use 3	**Coefficient**		**Acres (A5)**			**C5**
Heliostat Field & Other (Group D)	**0.35**	**x**	**327**	**=**		**114.45**
8. Average Post -Project Runoff Coefficient			**(C3 + C4 + C5) / (A3 + A4 + A5) =**			0.27

II. SITE LAYOUT MAPS

Attach the Following:

1.6. **A. General Location Map showing nearby roads and highways [§ III.A.1.j.]**

1.7. **B. Detailed Site Map [§ III.A.1.j.i. - xiii.]** ***updated and revised as site conditions change, new BMPs are implemented, and areas are stabilized*.**

The Detailed Site Map must be drawn to scale and indicate the following:

1. Existing and proposed topography, including drainage patterns and approximate slopes.
2. Areas where soils will be disturbed and areas that will not be disturbed.
3. Locations of onsite and offsite soil borrow and stockpile areas.
4. Locations of major structural and non-structural BMPs identified in this SWPPP.
5. Locations where stabilization practices will be applied.
6. Locations where vehicles and equipment will be stored and maintained.
7. Locations of onsite and offsite material and waste storage areas.
8. Locations of concrete washout areas.
9. Locations and aerial extent of all surface waters (including ephemeral water bodies, dry washes and wetlands) that may receive discharges from the disturbed areas of the project.
10. Locations where storm water discharges will enter surface waters, the municipal storm drain system and/or ephemeral waters or dry washes at or near the site.
11. Location and description of any discharge associated with industrial activity other than construction, including storm water discharges from dedicated asphalt or concrete plants;
12. Areas where final stabilization has been accomplished;
13. A legend describing all symbols, BMP numbers and abbreviations used on the map.
14. A north arrow and a map scale.

There are four detailed site maps attached:

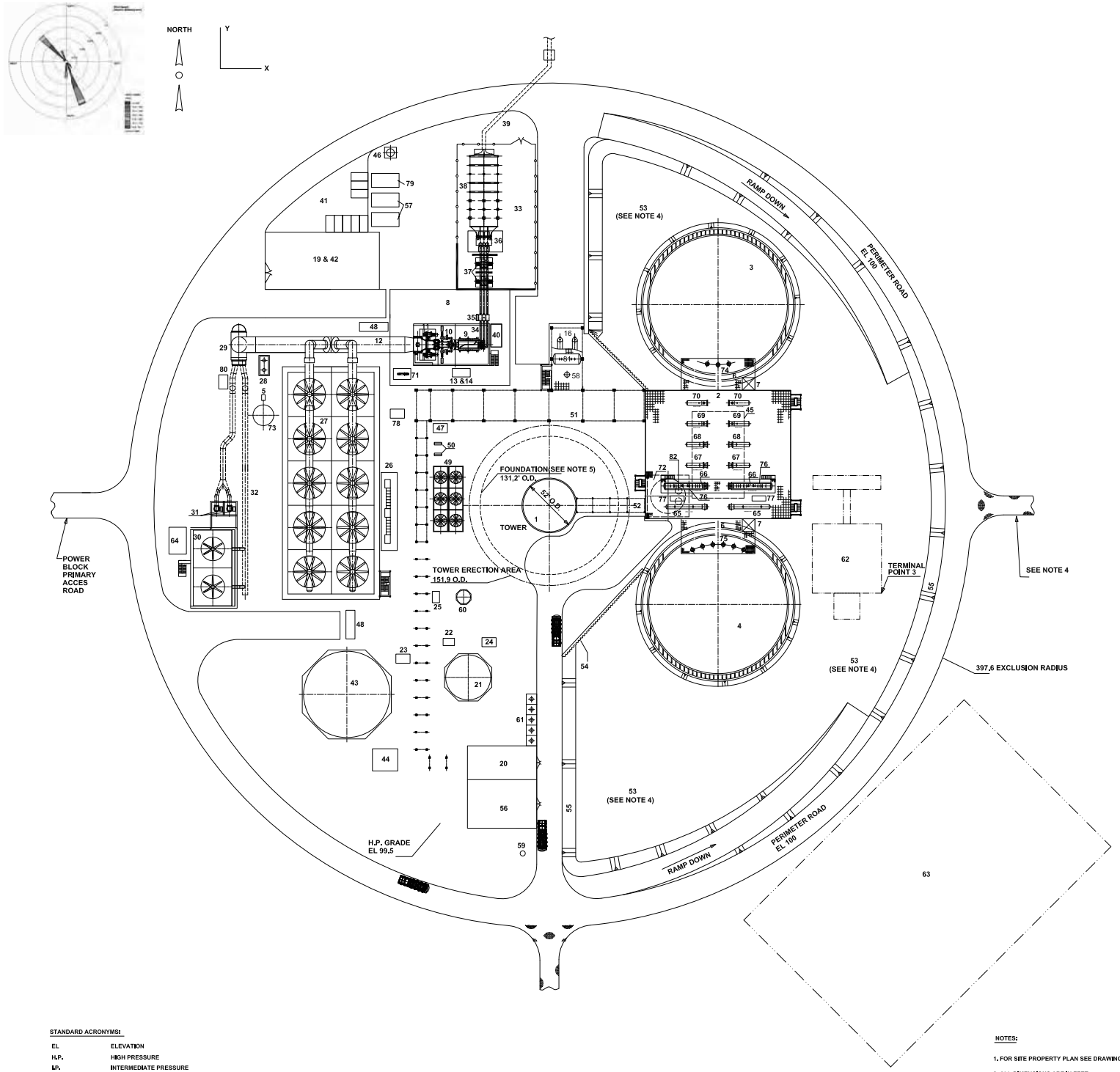
- Overall Site Layout
- CSDEP Generating Facility Detail
- Borrow Pit Detail
- Substation and Gen-Tie Detail

1.8. **C. Industrial Discharges [§III.A.1.j.xi]**

Provide the location and description of any discharge(s) associated with industrial activity other than construction, including any storm water discharges from dedicated asphalt or concrete plants covered under General Permit NVR100000.

There will be discharges from the concrete batch plant, which has BMPs as outlined in Section V.F.

CDSEP Power Block Arrangement (next Page)



LEGEND

1 SOLAR RECEIVER TOWER
2 STEAM GENERATION STRUCTURE
3 HOT SALT STORAGE TANK
4 COLD SALT STORAGE TANK
5 ALTERNATIVE MAKE UP PUMP
6 PUMP MAINTENANCE AREA
7 PUMP REMOVAL HATCH
8 STEAM TURBINE/GENERATOR AREA
9 GENERATOR
10 H.P. TURBINE
11 I.P/L.P. TURBINE
12 TURBINE EXHAUST DUCT
13 HYDRAULIC OIL UNIT
14 LUBE OIL UNIT
15 FLOOR TRENCH
16 HEATER BAY
17 BOILER FEEDWATER PUMPS (NOT SHOWN)
18 DEAERATOR (NOT SHOWN)
19 ELECTRICAL BUILDING
20 WATER TREATMENT AREA/BUILDING
21 DEMINERALIZED WATER TANK
22 DEMINERALIZED WATER PUMPS
23 SERVICE WATER PUMPS
24 HELIOSTAT CLEANING WATER PUMP SKID
25 POTABLE WATER PUMP SKID
26 ACC POWER CENTER
27 AIR COOLED CONDENSER
28 CONDENSATE PUMPS 2x100%
29 WATER COOLED CONDENSER
30 MECHANICAL DRAFT COOLING TOWER
31 CIRCULATING WATER PUMPS
32 CIRCULATING WATER PIPES (BURIED)
33 ELECTRICAL TRANSMISSION AREA
34 ISOLATED PHASE BUS
35 GENERATOR CIRCUIT BREAKER SWITCHGEAR
36 GENERATOR STEP-UP TRANSFORMER
37 UNIT AUXILIARY TRANSFORMER
38 STEP-UP CIRCUIT BREAKER
39 230kV UNDERGROUND LINE
40 EXCITATION ROOM
41 PARKING
42 CONTROL & OPERATIONS BUILDING
43 SERVICE/FIRE WATER STORAGE TANK
44 FIRE WATER PUMP HOUSE
45 ELECTRICAL BUILDING/SGS
46 DIESEL FUEL STORAGE TANK
47 COMPRESSED AIR SYSTEM
48 OIL / WATER SEPARATORS
49 FIN FAN COOLER
50 CLOSED COOLING WATER PUMPS
51 HIGH ENERGY PIPE RACK
52 SALT PIPE RACK
53 MOLTEN SALT CONTAINMENT AREA
54 RETAINING WALL
55 2:1 SLOPED SOIL
56 WAREHOUSE AND WORKSHOP
57 M.V. EMERGENCY GENERATOR
58 CLOSED COOLING CIRCUIT TANK
59 RAW WATER SUPPLY WELL 1 & PUMPS
60 POTABLE WATER TANK
61 REAGENTS
62 SALT MELTING (TEMPORARY)
63 SALT STORAGE (TEMPORARY)
64 CIRCULATING WATER TREATMENT
65 PREHEATER
66 EVAPORATOR
67 SUPERHEATER 1
68 SUPERHEATER 2
69 REHEATER 1
70 REHEATER 2
71 GLAND STEAM CONDENSER
72 SALT DRAINAGE TANK
73 CONDENSATE STORAGE TANK
74 HOT SALT PUMPS
75 COLD SALT PUMPS
76 STEAM DRUM
77 SGS CIRCULATION PUMPS
78 AUXILIARY BOILER
79 L.V. EMERGENCY GENERATOR
80 VACUUM PUMPS
81 DEAERATOR
82 SALT DRAINAGE PUMPS

STANDARD ACRONYMS:

EL	ELEVATION
H.P.	HIGH PRESSURE
I.P.	INTERMEDIATE PRESSURE
L.P.	LOW PRESSURE
H.P. GRADE	HIGH POINT OF GRADE
O.D.	OUTSIDE DIAMETER
TYP	TYPICAL
L.V.	LOW VOLTAGE
M.V.	MEDIUM VOLTAGE

SCALE IN FEET
0 10 20 30 40 50 100 150 ft

NOTES:

1. FOR SITE PROPERTY PLAN SEE DRAWING CDS-10-U-TDF-IEM-850.
2. ALL DIMENSIONS ARE IN FEET.
3. PLANT EL 100' IS A REFERENCE ELEVATION EQUAL TO AN APROXIMATE ACTUAL GRADE LEVEL OF EL "LATER".
4. BOTTOM ELEVATION OF CONTAINMENT AREA TO BE DETERMINED LATER.
5. FINAL TOWER FOUNDATION O.D. WILL DEPEND ON TOWER SUPPLIER

REV.	DESCRIPTION	DATE	DRAWN	CHECKED	CONSTRUCTION	Q.A.	APPROVED
1	FOR APPROVAL	01-01-2011	[illegible]	[illegible]		MPB	JGL
0	FOR APPROVAL	11-04-2011	TGG	NCR		MPB	JGL

MODIFICATIONS

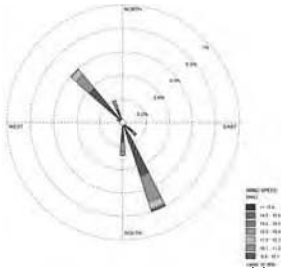
OWNER: TONOPAH SOLAR
EPC CONTRACTOR: cobra
OWNER N°:
PROJECT: Crescent Dunes Solar Energy Project

ISSUED: ☐ FOR INFORMATION ☐ FOR CONSTRUCTION ☒ FOR APPROVAL ☐ AS-BUILT ☐ FOR ASKING QUOTATION PURCHASING

FORMAT: Ansi E
SCALE: 1 : 400 -
DRAWING TITLE: BOP GENERAL ARRANGEMENT
DRAWING N°: CDS-10-U-TDA-IEM-860
File:
Job Number: 11031
SUBCONTRACTOR N°: CDS-10-U-TDF-IEM-860
SHEET 1 OF 1
REV. 1

INITEC energías

CDSEP Generating Facility Site Map (next Page)



SITE WIND SPEED AND DIRECTION DATA
(REFERENCE:NREL)

NORTH OF
POWER PLANT

33 34 35

04 03 02

RADIUS 4643

RADIUS 4613

5407

3879

T5N

T4N

4551

POWER BLOCK (R 397.6)
ASPHALT SURFACED ROAD

WELL # 2
(NOTE 2)

WELL # 1
(NOTE 2)

(NOTE 1)

(NOTE 6)

ASPHALT SURFACED ROAD

GRAVEL SURFACED ROAD

GRAVEL SURFACED ROAD

GRAVEL SURFACED ROAD

GABBS POLE LINE ROAD

TERMINAL POINT 2
(NOTE 4)

1 ACCESS CONTROL
2 CONSTRUCTION TRAILERS
3 CONSTRUCTION LAYDOWN
4 HELIOSTAT ASSEMBLY BUILDING AND WAREHOUSE
5 FUEL TANK
6 EVAPORATION PONDS
7 CONSTRUCTION LAYDOWN AND PARKING
8 EXISTING ANACONDA-MILLERS 120 KV LINE
9 NEW TONOPAH-ANACONDA 230 KV LINE (ROUTE TBD)

LEGEND

PERMANENT FENCE

PROJECT SITE RIGHT-OF-WAY BOUNDARY

NOTES:

1.-TOWER CENTERLINE AT 38° 14' 20" N
117° 21' 48.90" W (NAD83)

2.-WELL-1-LOCATION ALLOWABLE AREA.
AREA OF RADIUS 300' AROUND POINT WITH
COORDINATES 38° 14' 16.73" N - 117° 21' 49.20" W (NAD83)
WELL-2-LOCATION ALLOWABLE AREA.
AREA OF RADIUS 300' AROUND POINT WITH
COORDINATES 38° 14' 27.35" N - 117° 21' 44.72" W (NAD83)

3.-ANCILLARY FACILITIES SUCH AS
ADMINISTRATION BUILDING, HELIOSTAT
ASSEMBLY BUILDING, PARKING AND LAYDOW
TO BE GENERALLY LOCATED AS SHOWN AND
OPTIMIZED DURING DETAILED DESIGN.

4.-CONNECTION WITH SR-89
(GABBS POLE LINE ROAD) AT TBD.

5.-DIMENSIONS ARE SHOWN IN FEET
(US CUSTOMARY SYSTEM)

6.-DISTANCE REFERED TO ROAD AXES

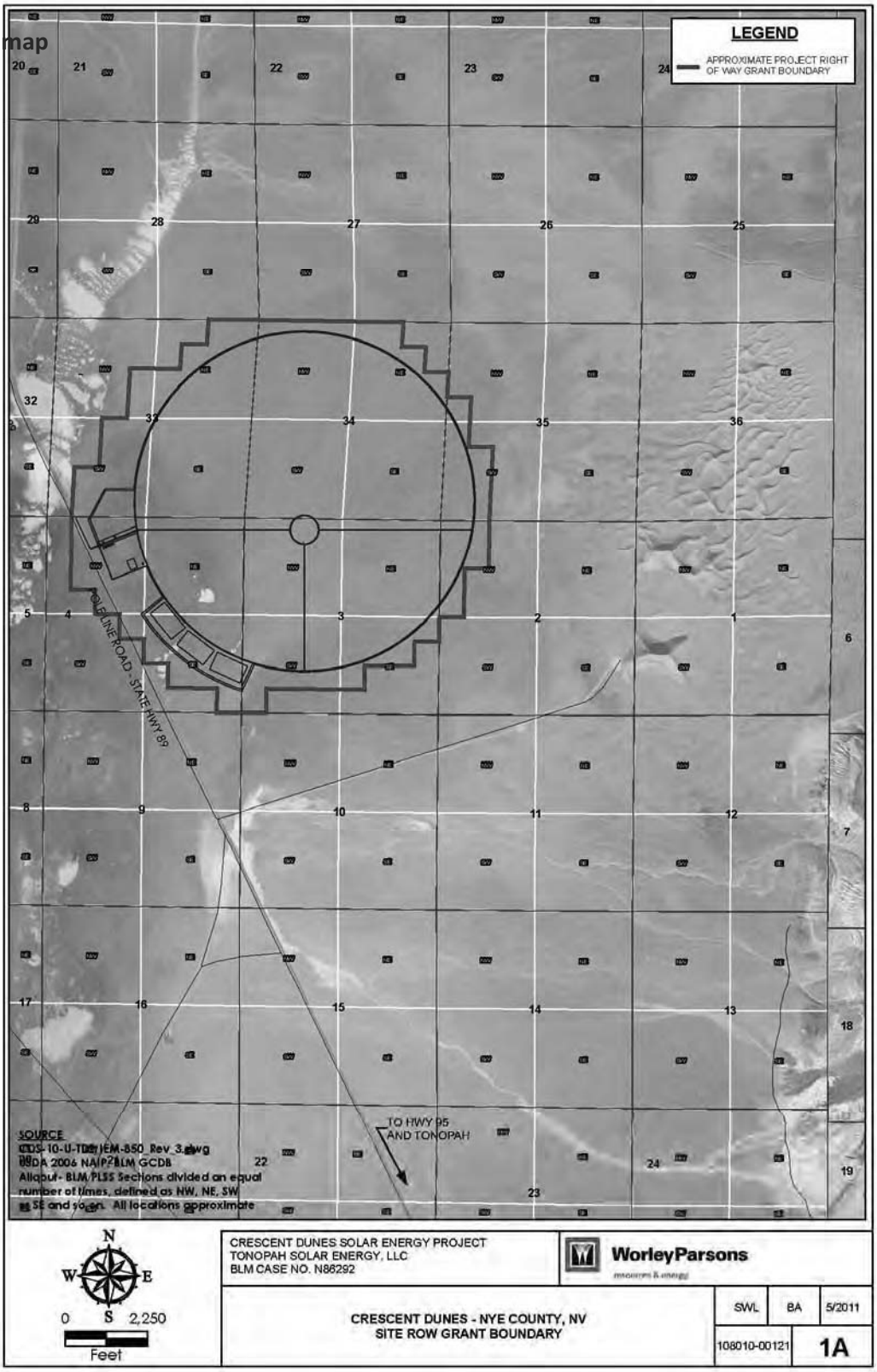
7.-TEMPORARY FACILITIES ZONE IN DRAWING
CDS-10-VOD-TDA-IEM-001

SCALE IN FEET
0' 100' 250' 500' 1000'

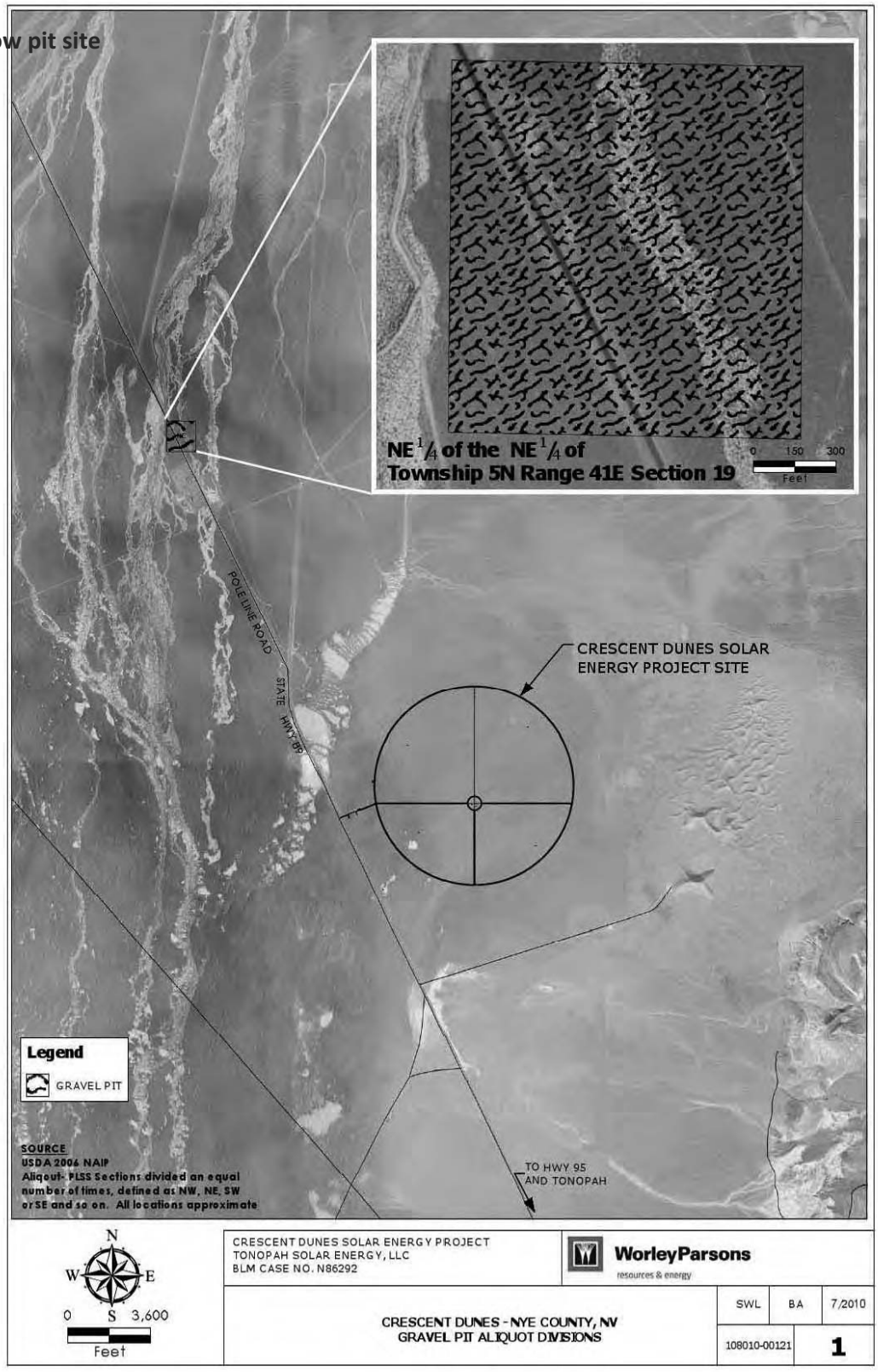
REV.	DESCRIPTION	DATE	DRAWN	CHECKED	Q.A.	APPROVED
	MODIFICATIONS					
5	FOR DESIGN	04-01-01	EFA	NCR	MPB	JGL
4	FOR DESIGN	11-05-13	EFA	NCR	MPB	JGL
3	FOR DESIGN	11-04-29	DHR	NCR	MPB	JGL
2	FOR DESIGN	11-04-27	DHR	NCR	MPB	JGL
1	FOR DESIGN	11-04-20	DHR	NCR	MPB	JGL
0	FOR APPROVAL	11-03-24	TQG	NCR	MPB	JGL

OWNER: TONOPAH SOLAR
EPC CONTRACTOR: cobra
OWNER N°:
PROJECT: Crescent Dunes Solar Energy Project
ISSUED: FOR INFORMATION / FOR APPROVAL / FOR ASKING QUOTATION PURCHASING / FOR CONSTRUCTION / AS-BUILT
FORMAT: Ansi E
SCALE: 1 : 5000 -
DRAWING TITLE: PLOT PLAN GENERAL
DRAWING N°: CDS-10-U-TDA-IEM-850
File:
SUBCONTRACTOR N°: CDS-10-U-TDF-IEM-850
INITEC energia
Job Number 11601
SHEET 1 OF 1
REV. 5

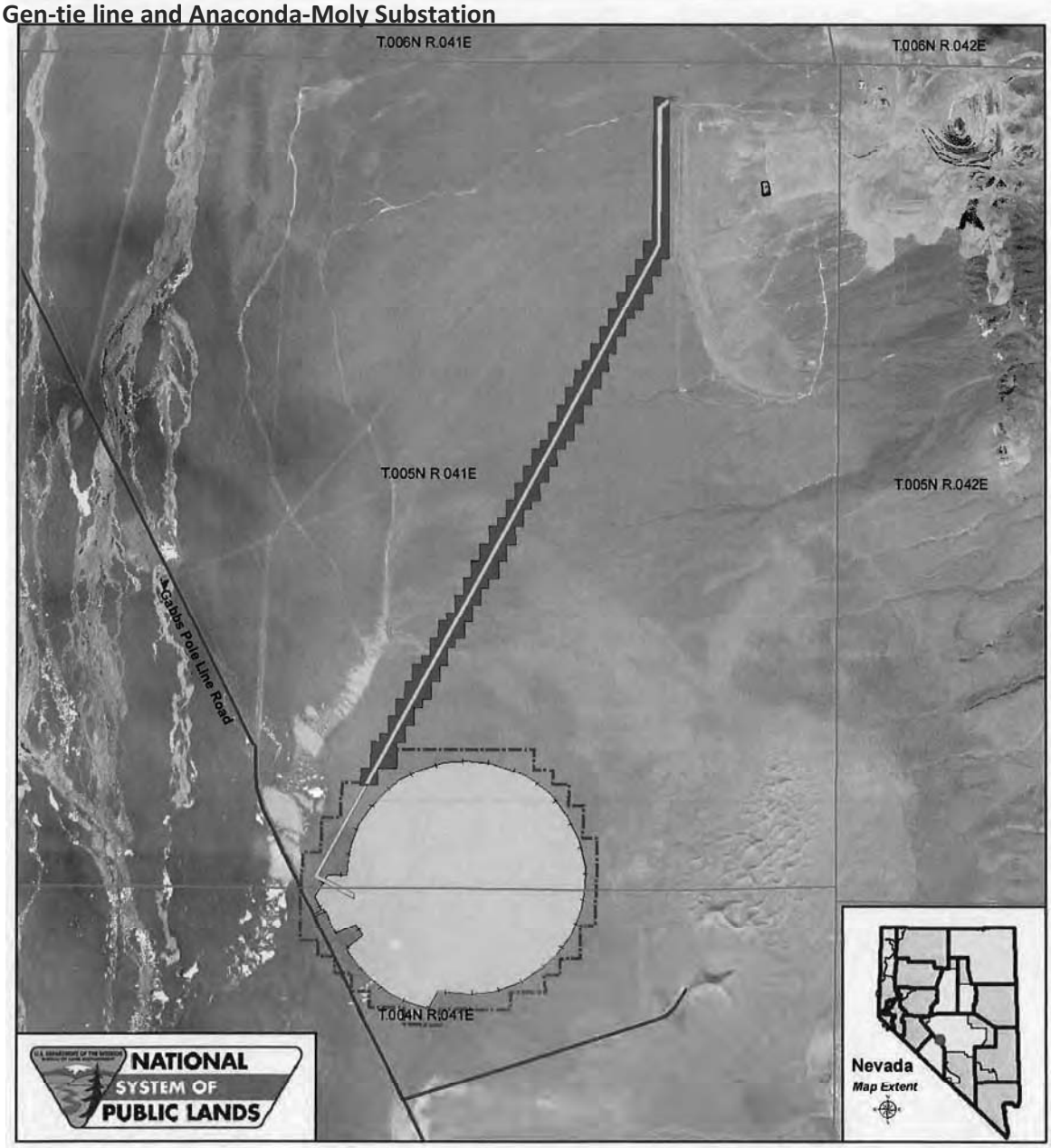
Site map



Borrow pit site



Gen-tie line and Anaconda-Moly Substation



Exhitbit A

N-86292, N-87933

N
W E
S

Legend

ProjectSite
- Approximate Project Site
- Approximate Project Site Fenceline
- Approximate Transmission Line
- Gen-Tie Line Legal Description
- PLSS Township

0 1.25 2.5 Miles

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources. This information may not meet National Map Accuracy Standards. This product was developed through digital means and may be updated without notification.

III. RECEIVING WATERS

1.9. **A. Receiving Water(s) Identification [§III.A.1.i.xii]:**

Identify the name and location of the streams, rivers, ditches, drainages, lakes, wetlands (both perennial and intermittent), or other special aquatic sites that will be disturbed or will receive runoff from the construction site. If the site will drain to the municipal storm drain system, identify the receiving water to which the system discharges.

The CDSEP is located in the Great Basin Watershed within the Tonopah Flat Basin and is isolated from a majority of the upstream off-site stormwater run off by the Crescent Dunes. The site is located on Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) 320018-1950C. The Project Site is in Zone X which is defined as "*Areas determined to be outside the 500-year flood plain".*

There are several blue line washes identified in United States Geological Survey (USGS) maps in the vicinity of the CDSEP, that discharge into the Peavine Creek (approximately a mile downstream of the CDSEP). Peavine Creek discharges south into the Big Smokey Valley in Esmeralda County, which contains several small lakes (approximately 120 acres each) and two larger lakes at the low point (approximately 1,300 acres and 2,700 acres each) classified by the US Fish and Wildlife Service National Wetlands Inventory.

The existing Anaconda-Moly Mine Access Road crosses several blue line washes, therefore the construction workers will also cross the washes in vehicles when installing the gen-tie. No construction work will be undertaken in the washes.

It is anticipated that the construction activities will have no impact on these waterways as all runoff from the CDSEP construction site will be contained within a sediment basin, installed as part of the BMPs program.

1.10. **B. 303(d) Impaired Water Body Listing [§III.A.10.b]:**

Check the current 303(d) listing of Impaired Water Bodies, issued by the Nevada Division of Environmental Protection (http://ndep.nv.gov/bwqp/standard.htm). If any of the receiving waters noted above appear on the 303(d) list, describe: a) the condition for which the water body has been listed, b) whether discharges from the site will contribute significantly to any 303(d) listing, and c) the BMPs that will be implemented to ensure that discharges from the site will not cause or contribute to an exceedance of State water quality standards.

Under NDEP 303(d) listing documents, issued in February 2009, the CDSEP is located within Region 10, Central Region. The only 303(d) listed impaired water body in this region is the Comins Reservoir, which is a 410 acre fishing location near Ely, in White Pine County, which is over 150 miles north east of the CDSEP.

1.12. **C. Total Maximum Daily Load (TMDL) requirements [§III.A.10.b]:**

Does the construction site discharge runoff into a water body with an established TMDL?
☐**YES** ☒**NO**

Describe the BMPs that will be applied to comply with all applicable TMDL requirements

N/A

IV. BMP IMPLEMENTATION

1.14. **A. Storm Water Best Management Practices (BMPs)**	
Describe each storm water control measure and the general sequence of implementation during the construction process. Clearly identify the BMPs that will be used for each of the major soil-disturbing activities identified in Section I.B, above [§ III.A.2]. Describe the design, installation and maintenance of each BMP, and indicate the parties that will be responsible for carrying out these functions for each control measure. Control measures must be properly selected, installed, and maintained in accordance with the manufactures specifications and good engineering practices. Offsite material storage areas used solely by the permitted project must also be addressed [§ III.A.3].	
1.	Pre-Construction to Completion: Scheduling • **The project schedule will sequence construction activities with the installation of the BMPs including soil stabilization and sediment control measures.** • **The schedule will be arranged as much as practicable to leave existing vegetation undisturbed until immediately prior to grading, and minimize the amount of disturbed area at any one time and avoiding exposing large areas of bare soil to the wind and water erosion.** • **Grading operations shall be undertaken during dry months when practicable to allow enough time before rainfall begins to stabilize the soil.** • **Contractor to monitor the weather using National Weather Service reports to track conditions and alert crews to the onset of rainfall events.** • **When rainfall is predicted, the construction schedule shall be adjusted where practicable and BMPs shall be installed on all disturbed areas prior to the onset of rain.** • **Mitigate impacts in sensitive areas during severe weather events.** **Undertaken at commencement of project and throughout construction.**
2.	Pre-Construction to Completion: Education • **Prior to work on the project, inform all construction personnel of environmental concerns, pertinent laws and regulations, and elements of the SWPPP.** • **During work, hold meetings with employees, contractors and sub contractors to discuss the relevant BMPs and ensure being implemented.**

3.	BMPS to be installed in first two months of construction:
	• **Designate Laydown area – to contain locations for:**
	  ○ **Material handling and storage (hazardous and non hazardous) (refer to Section V.A)**
	  ○ **Waste storage (hazardous and non hazardous) (refer to Section V.D and E)**

	○ **Sanitary facilities (refer to Section V.E)** ○ **Parking facilities** ○ **Equipment/Vehicle Cleaning Area (refer to Section IV.F)** ○ **Equipment/Vehicle Fueling Area (refer to Section IV.F)** ○ **Equipment/Vehicle Maintenance Area (refer to Section IV.F)** ○ **Batch Plant Area (including concrete washout area) (refer to Section V.F)** • **Structural Practice BMPs (refer Section IV.D) including silt fences and sediment basin.** • **Offsite Tracking Controls (refer Section V.B) including Construction Entrance/Exit and tire wash and Construction Roadway.** • **Soil Stabilization at culverts (refer Section V.G).**
4.	Site Clearing / Grubing: **Relevant BMPs are:** • **Temporary Soil Stabilization BMPs (refer Section IV.B) including preservation of vegetation and stockpile covers.** • **Structural Practice BMPs (refer Section IV.D).** • **Non Stormwater Discharge Control BMPs (refer Section IV.F) including equipment/ vehicle cleaning/fueling/maintenance.** • **Dust Control BMPs (refer Section V.C) including speed limits and covering trucks.**
5.	Assemble and erect heliostats **(Months 10 to 20); Relevant BMPS are:** • **Structural Practice BMPs (refer Section IV.D)** • **Non Stormwater Discharge Control BMPs (refer Section IV.F) including pile operations, equipment/vehicle cleaning/fueling/maintenance.** • **Material Storage, Spill Prevention and Control BMPs (Section V.A).** • **Dust Control BMPs (refer Section V.C) including speed limits and covering trucks.** • **Construction Waste Storage and Disposal BMPs (refer Section V.D).** • **Hazardous Waste Storage and Disposal BMPs (refer Section V.E).**
6.	Power block construction **(Months 6 to 24); Relevant BMPs are:** • **Permanent soil stabilization BMPs (refer Section IV.C).** • **Structural Practice BMPs (refer Section IV.D).** • **Non Stormwater Discharge Control BMPs (refer Section IV.F) including pile operations and equipment/vehicle cleaning/fueling/maintenance.** • **Material Storage, Spill Prevention and Control BMPs (Section V.A).** • **Dust Control BMPs (refer Section V.C) including speed limits and covering trucks.** • **Construction Waste Storage and Disposal BMPs (refer Section V.D).** • **Hazardous Waste Storage and Disposal BMPs (refer Section V.E).** • **Offsite Discharger BMPs (refer Section V.F) for the borrow pit.**
7.	Construct reinforced concrete foundations **(Months 6 to 24); Relevant BMPs are:** • **Structural Practice BMPs (refer Section IV.D).**

	• **Non Stormwater Discharge Control BMPs (refer Section IV.F) including equipment/vehicle cleaning/fueling/maintenance.** • **Material Storage, Spill Prevention and Control BMPs (Section V.A).** • **Dust Control BMPs (refer Section V.C) including speed limits and covering trucks.** • **Construction Waste Storage and Disposal BMPs (refer Section V.D).** • **Hazardous Waste Storage and Disposal BMPs (refer Section V.E).** • **Offsite Discharger BMPs (refer Section V.F) including batch plant operations.**
8.	Construct and install Gen-tie line **(Months 12 to 18); Relevant BMPs are:** • **Temporary Soil Stabilization BMPs (refer Section IV.B) including preservation of vegetation and stockpile covers.** • **Non Stormwater Discharge Control BMPs (refer Section IV.F) including equipment/vehicle cleaning/fueling/maintenance.** • **Material Storage, Spill Prevention and Control BMPs (Section V.A).** • **Dust Control BMPs (refer Section V.C) including speed limits.**
9.	Expand Anaconda-Moly Substation **(Months 15 to 21); Relevant BMPs are:** • **Temporary Soil Stabilization BMPs (refer Section IV.B) including preservation of vegetation and stockpile covers.** • **Structural Practice BMPs (refer Section IV.D).** • **Non Stormwater Discharge Control BMPs (refer Section IV.F) including equipment/vehicle cleaning/fueling/maintenance.** • **Material Storage, Spill Prevention and Control BMPs (Section V.A).** • **Offsite Tracking Controls (refer Section V.B) including Construction Entrance/Exit.** • **Dust Control BMPs (refer Section V.C) including speed limits and covering trucks** • **Construction Waste Storage and Disposal BMPs (refer Section V.D).** • **Hazardous Waste Storage and Disposal BMPs (refer Section V.E).** • **Offsite Discharger BMPs (refer Section V.F) for the borrow pit.**
10.	Construct administration/warehouse building **(Months 20 to 22); Relevant BMPs are:** • **Structural Practice BMPs (refer Section IV.D).** • **Non Stormwater Discharge Control BMPs (refer Section IV.F) including equipment/vehicle cleaning/fueling/maintenance.** • **Material Storage, Spill Prevention and Control BMPs (Section V.A).** • **Dust Control BMPs (refer Section V.C) including speed limits and covering trucks.** • **Construction Waste Storage and Disposal BMPs (refer Section V.D).** • **Hazardous Waste Storage and Disposal BMPs (refer Section V.E).**
11.	Final stabilization of site **(Month 27); Relevant BMPs are:** • **Permanent Soil Stabilization BMPs (refer Section IV.C).** • **Post construction soil stabilization BMPs (refer Section IV.E).**

1.15. B. Temporary Soil Stabilization Practices [§ III.A.5]

Describe the interim or temporary stabilization BMPs (e.g. soil binders, revegetation and/or mulching) that will be provided on stockpiles and disturbed portions of the site where construction activity is expected to cease for 14 days or more and will not be resumed within 21 days.

a) Description

The following Erosion Control Measures are designed to prevent soil particles from detaching and becoming transported in stormwater runoff by protecting the soil surface (i.e. covering and/or binding soil particles). The Construction Contractor may use the following BMPs as necessary:

- Preservation of existing vegetation
- Mulch (straw / hydraulic)
- Soil Binders
- Geotextiles and Mats
- Equipment Selection

Preservation of Existing Vegetation

- **Delineate all the areas within the construction zone.**
- **Only the areas within this construction zone will have vegetation disturbed, and shall be removed using a methodology to minimize the surface disturbance (i.e. cutting/mowing methods instead of blading) and the root structures shall be left in place were possible. All vegetation (i.e. desert shrub) outside this construction zone shall be preserved.**
- **The removed vegetation shall be collected and stockpiled on site for use after decommissioning of the facility (refer to Section IV. C).**
- **Temporary roadways / stockpiles and layout areas shall be located to avoid the desert shrub.**
- **Construction Contractors and subcontractors shall be instructed to honor protective devices and do not allow heavy equipment, vehicular traffic or storage of construction material within the protected area and outside of the access road area.**

Undertaken at commencement of project (Month 1-2) and during gen-tie and substation expansion construction activities.

Mulch

- All disturbed bare areas within the construction zone shall be identified, and those areas adjacent to excavations and on shallow slopes and stockpiles.
- Prior to application of mulch, the surface shall be roughened (i.e. using crimping or punching type roller or track walking) to assist in the incorporation of mulch to the surface.
- Straw/Hydraulic mulch may be placed on disturbed areas in uniform layer and incorporating it into the soil with a studded roller or anchoring with a tackifier stabilizer emulsion depending on the slope steepness, accessibility, soil conditions and longevity.

- Hydraulic mulch requires 24 hours to dry before rainfall occurs, and must contain wood fiber mulch (paper based hydraulic mulches are not used for erosion control). Typically hydraulic mulch shall be applied at the rate of 2,000 to 4,000 lbs per acre, however it is generally specified by the manufacturer.
- Straw mulch with tackifier should not be applied during or immediately before rainfall. Typically straw is applied at a minimum rate of 4,000 lbs / acre, however it is generally specified by the manufacturer. Generally, applying ½ ton of straw mulch per acre will reduce erosion up to 75%, while applying 2 tons per acre, reducing erosion up to 98% (Nevada BMP Field Guide).
- Excess mulch placement shall be avoided as it will be blown off-site or washed away into drainage channels, sediment basin, and/or silt fences.

Undertaken throughout the construction period – dependant on soil disturbing activities.

The Nevada BMP Field Guide (2008) contains a list of mulch products, application rates, benefits and limitations for consideration of the Contractor.

Soil Binders

- **A soil binder will be selected that is suitable for the soil conditions / regional soil type and be environmentally benign.**
- Prior to application of a soil binder, the surface will be roughened (i.e. using crimping or punching type roller or track walking) to assist in the incorporation of binder to the surface.
- **Soil binders will be applied based on manufacturers specifications, and the contractors need to allow suitable time (generally minimum 24 hours) and weather conditions (generally above 40°F with no rain) to facilitate curing process. Soil binders may require reapplying after a storm event.**

Undertaken throughout the construction period – dependant on soil disturbing activities.
The Nevada BMP Field Guide (2008) contains a list of soil binder products, application rates, benefits and limitations for consideration of the Contractor.

Geotextiles and Mats

Geotextiles and mats are used to cover the soil surface to reduce erosion from rainfall impact, hold soil in place and absorb and hold moisture near the soil surface. Biodegradable rolled erosion control products (RECPs) are typically composed of jute fibers, curled wood fibers, straw, coconut fiber, or a combination of these materials. In order for an RECP to be considered 100% biodegradable, the netting, sewing or adhesive system that holds the biodegradable mulch fibers together must also be biodegradable (CA Stormwater BMP Handbook). Non-biodegradable RECPs are typically composed of polypropylene, polyethylene, nylon or other synthetic fibers. In some cases, a combination of biodegradable and synthetic fibers is used to construct the RECP. Netting used to hold these fibers together is typically non-biodegradable as well (CA Stormwater BMP Handbook). BMPs include:

- Polyethylene covers may be used to cover exposed soil (including the berm) and stockpiled material areas. Covers will be placed over stockpiles prior to forecast storm

events, and anchored to prevent damage by wind.

- Generally these are applied on areas with short, steep slopes where the erosion hazard is high and vegetation will be slow to establish (or not applicable).
- Refer to the manufacturer's specifications for flow rate limitations and installation procedures for geotextiles, mats and plastic covers.
- Materials shall be are anchored appropriately, which may be undertaken using wire staples, metal geotextile stake pins or wooden stakes.

Undertaken throughout the construction period – dependant on soil disturbing activities.

Equipment Selection

- In areas of highly erodible soils, construction equipment and techniques will be used to minimize surface disturbance, soil compaction and loss of top soil, such as vehicles with low ground pressure tires.
- If wet areas can not be avoided, other BMPs can be implemented such as wide-track or balloon-tire vehicles and equipment, or other approved weight dispersing systems, geotextile cushions, pre-fabricated equipment pads.
- If the BMPs can not be successfully applied, construction / routine maintenance would not be allowed in these areas until the project conditions improve and construction activity can proceed without damage to the soils (refer to Section IV.A Scheduling).

Undertaken throughout the construction period – dependant on soil disturbing locations

b) Records

The following records shall be maintained and attached to the SWPPP (refer Section VIII.A and Attachment B) - the dates when:

- Major grading activities occur;
- Construction activities temporarily or permanently cease on a portion of the site; and
- **When stabilization measures are initiated.**

c) Deadlines for Stabilization

Slopes that are susceptible to erosion will be protected by the installed controls identified in this SWPPP, and stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than fourteen (14) days after the construction activity in that portion of the site has temporarily or permanently ceased, except for the following conditions:

i. Where the initiation of stabilization measures by the fourteenth (14th) day after construction activity temporary or permanently cease(s) is precluded by snow cover or frozen ground conditions, stabilization measures shall be initiated as soon as practicable.
ii. Where construction activity on a portion of the site is temporarily ceased, and earth-disturbing activities will be resumed within twenty-one (21) days, temporary stabilization measures do not have to be initiated on that portion of site.
iii. In arid areas (areas with an average annual precipitation of 0 to 10 inches), semiarid areas (areas with an average annual precipitation of 10 to 20 inches), and areas experiencing droughts where the initiation of stabilization measures by the fourteenth

(14th) day after construction activity has temporarily or permanently ceased is precluded by seasonal arid conditions, stabilization measures shall be initiated as soon as practicable.

1.16. **C. Permanent Soil Stabilization Practices [§III.A.5]**

Describe the permanent stabilization BMPs (e.g. permanent revegetation and/or rolled erosion control products) that will be provided on disturbed portions of the site where construction activities have permanently ceased.

The NDEP defines final stabilization as a uniform (e.g. evenly distributed, without large bare areas) perennial vegetation cover with a density of 70% of the native background vegetation cover on all unpaved areas and areas not covered by permanent structures or equipment.

Reestablishment of the native vegetation is generally an effective permanent soil stabilization practice, however reestablishing desert shrub in the heliostat field is a fire risk, and may cause damage to the mirrors when they are placed in the stow position. Therefore the soil will be permanently stabilized during operation without the reintroduction of desert shrub. Permanent soil stabilization practices considered for this site include:

- **Reestablishment of non-persistent and non-invasive vegetation that does not cause a fire risk or damage to facilities; or**
- **Installation of rock / geotextiles / erosion control blankets / RECP were reseeding is not viable option.**

The vegetation (including desert shrub) removed during clearing / grubbing will be collected and stockpiled on site, then protected from wind and water erosion by implementation of temporary BMPs throughout construction, operation and decommission of the facility. Following decommission, the stockpiled top soil would be replaced across the site where topsoil was previously removed to provide a proper soil substrate for seeding or planting and enhance reestablishment of native vegetation to preconstruction conditions.

1.18. **D. Structural Practices [§ III.A.6]**

Provide a description of the temporary and permanent erosion and sediment control BMPs (e.g. silt fences, fiber rolls, earth dikes, drainage swales, check dams, sediment traps, storm drain inlet protection, etc.) that will be used during construction to divert flows from exposed soils, and/or temporarily store flows and limit runoff from the exposed areas of the site.

For common drainage locations serving areas with ten (10) or more acres of disturbed soils, sediment basins shall be provided until final stabilization of the site. Sediment basins must be designed to the criteria outlined in the Truckee Meadows Construction Site BMP Handbook. From May to October, water must not be allowed to pond in any structural practice in excess of 7 days.

Velocity dissipation devices (e.g. rock outlet protection, channel lining, etc.) must be placed at storm drain pipe outfall locations and along the length of channels to reduce flow velocities and prevent erosion and degradation of receiving waters.

The following Erosion and Sediment Control Measures are designed to prevent sediment laden flows from discharging from the construction site. The Construction Contractor may use the following BMPs as necessary:

- Earth Dikes / Drainage Swales
- Velocity Dissipation Devices
- Silt Fence
- Sediment Basin
- Check Dams
- Fiber Rolls
- Gravel Bag / Sand Bags
- Storm Drain Inlet Protection

Earth Dikes / Drainage Swales

An earth dike is a temporary berm/ridge of compacted soil (by earth moving equipment) and a drainage swale is a depression that is used to divert and direct runoff to a desired location. BMPs include:

- A combination of earth dikes and drainage swales shall be installed upstream of the power block construction areas to divert the upstream flow around the disturbed construction areas and into drainage swales.
- Earth dikes / drainage swales may be installed along temporary access roads to control the movement of stormwater runoff from both the roads and the heliostat fields.
- Earth dikes are generally not used for drainage areas greater than 10 acres due to the potential volume of water they receive in a storm event. Generally, earth dikes have a 2:1 or flatter side slopes, 18 inches minimum height and minimum top width of 24 inches.
- Temporary drainage swales should not be used for drainage areas greater than 5 acres, and have a bottom width of at least 2 feet, depth of at least 18 inches and side slopes of 2:1 or flatter. The drainage swale must be able to contain the peak discharge from a 10 year storm event and must be lined for high flow velocities (although this is not expected for the CDSEP).
- Earth dikes / drainage swales are to be temporarily stabilized (i.e. using seed/mulch/rock/geotextiles) immediately after construction or prior to the first rain.
- The outlet of the earth dike / drainage swale will be into a sediment trap or sediment basin.

Velocity Dissipation Devices

A velocity dissipation device (VDD) is a physical structure composed of rock, grouted rip rap, concrete rubble or equivalent material, placed at the outlet of a pipe or channel to prevent scour of the soil from high velocity flows. BMPs include:

- There are many designs of VDDs. Generally the apron length and rock size is determined by the discharge pipe diameter and discharge rate. Generally temporary structures (culverts / pipes) should be designed up to the 10 year peak storm event.

- As per the NDEP requirements, VDD's must be placed at discharge locations and along the length of any outfall channel to provide a non-erosive flow velocity from the structure to a water course so that the natural physical and biological characteristics and functions are maintained.
- The pre-developed stormwater pattern on site is to sheet flow across and discharge into Peavine Creek south of this site, therefore VDD's will be installed at the outlet of any sediment basins/traps or where there is a transition from a channel into sheet flow.

Silt Fence

A silt fence is a fence made of filter fabric that has been entrenched in the ground and stretched between supporting wooden posts (on the downhill side), driven at least 12 inches in to the ground with a maximum spacing of 8 feet. Silt Fences are applicable for intercepting sheet or overland flows, and can be located around the perimeter of the CDSEP site, borrow put site, substation expansion area, below the toe of exposed / erodible slopes and around temporary stockpiles. BMPs include:

- Silt fences should be installed with a setback of at least 3 feet from the top of the slopes.
- Silt fences are not to be installed across ditches, channels or steep slopes (greater than 25%).
- The maximum length of slope drainage to any point along the silt fence should be 200 feet of less. On sloping sites, silt fences be spaced between 100 feet and 200 feet apart, depending on the slope and sand type (refer to Nevada BMP Field Guide, page 32).

Sediment Basin

A sediment basin is a temporary basin formed to detain sediment laden runoff, allowing it to settle out before it is discharged.

The Construction General Permit has the following requirements for sediment basins:

i. For common drainage locations that **serve an area with ten (10) or more acres** disturbed at one time, a temporary (or permanent) sediment basin that provides storage for a calculated volume of runoff from a 2-year, 24-hour storm event from each disturbed acre drained, or equivalent control measures, shall be provided where attainable until final stabilization of the site. Where no such calculation has been performed, a temporary (or permanent) sediment basin providing 3,600 cubic feet of storage per acre drained, or equivalent control measures, shall be provided where attainable until final stabilization of the site. When computing the number of acres draining into a common location it is not necessary to include flows from offsite areas and flows from onsite areas that are either undisturbed or have undergone final stabilization where such flows are diverted around both the disturbed area and the sediment basin. In determining whether installing a sediment basin is attainable, the permittee may consider factors such as site soils, slope, available area on site, etc. In any event, the permittee must consider public safety, especially as it relates to children, as a design factor for the sediment basin and alternative sediment controls shall be used where site limitations would preclude a safe design.

ii. For drainage locations that **serve ten (10) or more disturbed acres** at one time and where a **temporary sediment basin or equivalent controls is not attainable**, smaller sediment basins and/or sediment traps should be used. Where neither the sediment basin nor equivalent controls are attainable due to site limitations, silt fences, vegetative buffer strips, or equivalent sediment controls are required for all down slope boundaries of the construction area and for those side slope boundaries deemed appropriate as dictated by individual site conditions.

iii. For drainage locations **serving less than ten (10) acres**, smaller sediment basins and/or sediment traps should be used. At a minimum, silt fences, vegetative buffer strips, or equivalent sediment controls are required for all down slope boundaries (and for those side slope boundaries deemed appropriate as dictated by individual site conditions) of the construction area unless a sediment basin providing storage for a calculated volume of runoff from a 2-year, 24-hour storm event or 3,600 cubic feet of storage per acre drained is provided.

BMPs include:

- Generally, sediment basins should drain areas up to 75 acres, and be designed with the length of the basin being twice that of the width, a depth between 3 to 5 feet for safety and efficiency purposes and be able to drain within 72 hours of a storm event.
- Sediment basins should not hold standing water for longer than 7 days during the mosquito breeding season (March to October in Southern NV).
- Berms should be made of well compacted soil and placed in 6-inch layers for compaction.
- Outlet structures, such as perforated riser pipes, are required to slowly drain the capture stormwater and an overflow outlet is required to promote sheet flow. Outlet risers and discharge pipes should be 12-inches in diameter or larger (corrugated metal pipe as the preferred material). Risers should be topped with trash racks and anti vortex baffles, have ½ inch holes every 3 to 6 inches apart and be anchored to a concrete base, bedded in a pole of 1 to 5 inch rock to a height of at least 2 to 3 feet below the top of the containment berm or dike.
- Preliminary calculations for the sediment basin are provided in Attachment A.
- A Dam Safety permit from the State of Nevada's Dam Safety Division is required for a dam that has a crest height of 20 feet or higher (measured from downstream toe to crest) or has a crest height of less than 20 feet, but will impound **20 acre-feet or more** of movable material.

<u>Sediment Traps</u>

Sediment traps are small containment areas (depressions, swales or low-lying place) where sediment laden runoff is temporarily detained, allowing sediment to settle out before the runoff is discharged. In the power block area, the moderate slopes may direct runoff into a sediment trap area before overflowing through native stone rip-rap to reinstate natural sheet flow conditions. BMPs include:

- Sediment traps are generally used on drainage areas of less than 5 acres (larger areas use sediment basins) and should not hold standing water for longer that 7 days during

the mosquito breeding season (March to October in Southern NV).

- Sediment traps should allow water to drainage through a rock check dam outlet, be located over permeable soils that allow drainage or be pumped out with appropriate dewatering umps and sediment filter bags or other de-silting devices.
- Generally, sediment traps are sized to contain the stormwater runoff volume in a 2 year storm event.

Check Dams

Check Dams are small barriers constructed of rock (8 to 12 inches), gravel bags, sand bags, fiber rolls or other reusable products, that are placed access a drainage swale to reduce the velocity of flowing water, allowing sediment to settle in the stormwater. BMPs include:

- Generally check dams are used on small open channels that drain 10 acres or less, where runoff velocities exceed 5 feet per second and allow the high flows (2 year storm event of larger) to safely flow over the dam without increase in flooding.
- Check dams shall be placed at a distance and height to allow small pools to form between each check dam. Generally, for a ditch slope of 2%, check dams should be placed approximately 150 feet apart.
- The materials should be appropriately anchored (fiber rolls trenched and staked in place), and bags sacked no higher than 3 feet.

Fiber Rolls

Fiber Rolls are materials, such as straw or flax that are bound into a tight tubular roll, and placed at the toe and on the face of slopes, around stockpiles and the perimeter of the project to intercept runoff reducing the flow velocity and facility sediment settlement. BMPs include:

- Fiber rolls should be placed at a maximum interval of 20 feet apart for flat slopes (4:1 or flatter), and at 10 feet apart for steeper slopes (2:1 or greater).
- Fiber rolls should be trenched or keyed into a concave trench at least 2 to 4 inches deep to prevent runoff flowing underneath them.
- Fiber rolls should be staked into the ground (minimum 12 inches deep) and spaced a maximum of 4 feet on center. If fiber rolls placed in a row, the rolls shall be overlapped, and not abutted. Ends of the rolls shall be sloped up to prevent runoff from going around the roll.
- Refer to the manufacturers specifications for lifespan of product, slope limits etc.

Gravel Bag / Sand Bags

Gravel bag / sand bag berms are a series of bags (filled with either gravel or sand) which are placed in a row to intercept sheet flows and facilitate settlement of sediment, similar to the fiber rolls. The bags can also be used around sediment traps, drainage inlets, check dams, and parallel to roadways to keep sediment off paved areas. BMPs include:

- Gravel/Sand bag berms should be placed at a maximum interval of 50 feet apart for flat slopes (2:1 or flatter), and at 25 feet apart for steeper slopes (2:1 or greater).
- Drainage area should not exceed 5 acres.
- The ends of the gravel/sand bags should be turned upslope to prevent runoff ground

around the barrier.

- Gravel/sand bags should be placed at a maximum height of 18 inches in non-traffic areas, and 12 inches in construction traffic areas. The top width should be a minimum of 12 inches for one to two bags, and 24 inches for three or more layers of gravel bags. Generally, sandbags should be at least three bags high in a berm (minimum top width of 24 inches).
- The pyramid approach shall be used when stacking the bags.
- The manufacturers specifications shall be referred to for suitable material (bag and fill) and life spans.

Storm Drain Inlet Protection

Storm drain inlet protection is a sediment filter or impoundment area around a stormwater drain, drop inlet or curb inlet. The CDSEP may require inlet protection in the power block area. BMPs include:

- Use sand/gravel bags or a filter fabric fence may be used to facilitate a dam around the inlet.
- Filter fabric requires wooden stakes should be driven at least 18 inches into the ground or 12 inches below the base of the trench, which may not be achievable depending on the surface conditions.
- Sand/gravel bags require a gap will be left in the top row to serve as a spillway (flow from a severe storm such as the 10 year event, should not overtop the curb).
- A sediment filter bag may be installed under the inlet grate as the final protection measure.

1.20. **E. Post-Construction Storm Water Management Controls [§ III.A.7]**

Provide a description of the permanent measures that will be installed during construction to control pollutants in storm water discharges that will occur after construction is complete. These permanent storm water management BMPs include structural treatment controls and Low Impact Development (LID) practices such as vegetated swales, landscape detention, sedimentation basins, and sand filters (refer to the Truckee Meadows Structural Controls Design Manual and LID Handbook). Permittees are responsible for the installation and maintenance of these storm water BMPs until an approved Notice of Termination is received by NDEP. The installation of these devices may also require a separate NPDES permit.

The sedimentation basin used during construction may be developed in the location of the detention pond that is required post-construction to control the flow rate of stormwater from the site. Therefore the sediment basin will remain for stormwater capture post-construction.

The application of approved water or chemical suppressants during the long term operation of the CDSEP will be made based up on the determination for the need for additional coverage from time to time.

All temporary BMP measures will also be removed post-construction (i.e. silt fences, sand bags).

Low impact development practices will be incorporated throughout project design, construction and operation, therefore increase in sediment yield is not expected to be

substantially greater than pre-project condition.

1.22. F. Non-Storm Water Discharge Management [§ III.A.8.]

Provide a description of the activities that may produce non-storm water discharges, the measures used to reduce or eliminate non-storm water discharges, and the BMPs used to minimize pollutants in any non-storm water discharges that may occur. Non-storm water discharges include, but are not limited to water line flushings, vehicle or building wash-down, and dewatering from excavation (see §I.D.2 for a full list).

Non stormwater discharges are all discharges that do not originate from precipitate events. The following activities are expected to produce non stormwater discharges:

- **Paving operations**
- **Boring operations**
- **Foundation / structure construction operations**
- **Delivery / transportation operations**
- **Vehicle and equipment cleaning, fueling and maintenance**
- **Painting**

The following BMPs will be used to minimize pollutants from these activities and non-stormwater discharges:

- **Illicit Connection / Discharge**
- **Water Conservation Practices**
- **Dewatering Practices**
- **Paving and Grinding Operations**
- **Piling Operations**
- **Batch Plant Operations (refer to Section V.F)**
- **Concrete Curing and Finishing**
- **Vehicle and Equipment Cleaning**
- **Vehicle and Equipment Fueling**
- **Vehicle and Equipment Maintenance**

Illicit Connection / Discharge

- **Construction contractors will not be able to illegally dump or discharge materials (solids and liquids) on the construction site into drainage swales, local washes or into Peavine Creek.**

Water Conservation Practices

Water conservation practices are designed to minimize waster usage during construction which in turn will minimize erosion and transportation of pollutants offsite. BMPs include:

- Water application rates shall be minimized as necessary to prevent runoff and ponding.

- Water equipment leaks shall be repaired immediately.
- The water truck filling area shall be stabilized.
- For cleaning or surface preparation purposes, the areas shall be swept and vacuumed first to remove dirt before using water.
- Construction water runoff shall be directed to areas where it can soak into the ground or be collected and reused.

Dewatering Practices

Dewatering operations are practices that manage the discharge of pollutants when non-stormwater and accumulated precipitation must be removed from a work location so that construction work can be accomplished. BMPs include:

- Dewatering may be required to remove stormwater runoff in the basin for longer than 72 hours or for maintenance purposes (removal of sediment is required when the storage volume is reduced by one-half).
- Dewatering practices must comply with applicable local permits and cannot be discharged without prior notice and approval from local stormwater management agency.
- There are several devices that can be used to treat water during dewatering operations, including sediment basins, sediment trap, weir tanks, dewatering tanks, gravity bag filter, sand media particulate filter, pressure bag filter and cartridge filter.

Paving and Grinding Operations

The project will include placement of paving for the access roads and within the power block area. These BMPs are to prevent or reduce the discharge of pollutants from these paving operations. BMPs include:

- **Avoid paving during the wet season and reschedule paving, grinding, sealing and curing activities if rain is in the forecast.**
- **Materials stockpiled and stored away from drainage swales (refer to Section V. A)**
- **Disposal of waste (i.e. PCC, AC, sand, gravel, seals) shall be in conformance regulations (refer to Section V. D). AC grindings, pieces or chunks of material should not enter local washes, therefore perimeter structure controls shall be used (refer to Section IV. D) to capture the material, then vacuum / sweep up material for proper disposal.**
- **Drainage inlet structures and manholes shall be covered with filter fabric during work (refer Section IV.D).**
- **Only non-toxic substances shall be used to coat asphalt transport trucks and asphalt spreading equipment.**
- **Paving equipment parked onsite shall be parked over plastic to prevent soil contamination.**

Piling Operations

If piling operations are require as part of the foundation work, the following BMP's are to prevent or reduce the discharge of pollutants from driving concrete or steel piles.

- **Equipment shall be parked over plastic sheeting or equivalent if possible.**
- **BMPs for equipment cleaning, fueling and maintenance shall be adopted, as outlined in the following sections.**
- **Spill kits and clean up materials shall be available at all locations of pile driving.**

Concrete Curing and Finishing

Concrete curing is an activity undertaken when constructing foundations, and requires the use of both chemicals and water, and discharge of wastes. Concrete finishing activities include sand blasting / shot blasting / high pressure water blasting, aimed at removing the curing compound and final surface finish appearances. BMPs include:

- **Over spray of chemical curing products shall be avoided.**
- **The drift from spraying / blasting shall be minimized as much as possible by keeping the nozzle close to the surface, and not allowing any runoff.**
- **Drain inlets shall be protected prior to the application of curing compounds and undertaking any blasting activities (refer to Section IV.D).**
- **Collect contaminated water and waste from curing and blasting activities and disposal of as appropriate (refer to Section V. D).**

Vehicle and Equipment Cleaning

Ideally, vehicle and equipment cleaning operations will be undertaken off-site, however the following BMPs are to prevent or reduce the discharge of pollutants from these activities when undertaken onsite.

- **Vehicles / equipment shall be cleaned within a structure or building equipped with appropriate disposal facilities, otherwise if that is not available, an outside cleaning area shall be constructed that is paved with concrete/asphalt and bermed to contain wash waters and prevent runoff and run on. This area shall be located away from storm drain inlets or drainage facilities and configure with a sump to allow collection and disposal of wash water. Resulting wastes shall be disposed of in accordance with the Waste Management BMPS listed in Section V.D.**
- **Phosphate-free, biodegradable soaps shall be used and water usage minimized.**

Vehicle and Equipment Fueling

Ideally, vehicle and equipment fuelling operations will be undertaken off-site, however due to the remoteness of the site, onsite fueling operations will occur. The following BMPs are to prevent or reduce the discharge of pollutants from these fuelling activities when undertaken onsite.

- **Earth moving equipment storage shall be located near the west side of the heliostat field, where all the equipment can be most easily fueled. A dedicated level fueling**

area shall be provided at least 50 feet from drainage facilities and washes, and berms constructed to contain spills and prevent runoff and runon.

- **"Topping-off" of fuel tanks shall be discouraged.**
- **Fueling operations shall never be left unattended.**
- **Absorbent spill clean up materials and spill kits shall be available in fueling areas, plus drip pans / absorbent pads shall be used during fueling unless fueling is performed over an impermeable surface. Use absorbent materials on small spills and dispose of waste appropriately (refer to Section V. D).**
- **Employees and subcontractors shall be trained on the proper fueling and clean up procedures.**
- **Federal, state and local requirements for any stationary about ground storage tanks shall be observed.**

Vehicle and Equipment Maintenance

Ideally, vehicle and equipment maintenance operations will be undertaken off-site, however due to the remoteness of the site, onsite maintenance operations may occur. The following BMPs are to prevent or reduce the discharge of pollutants from these maintenance activities when undertaken onsite.

- **A dedicated level maintenance area shall be provided at least 50 feet from drainage facilities and washes, and berms constructed to contain spills and prevent runoff and runon.**
- **Drip pans or absorbent pads shall be used during work that involves fluids, unless work is performed over an impermeable surface in the maintenance area. Adsorbent materials shall be used on small spills and dispose of appropriately (refer to Section V.D).**
- **Vehicles and equipment shall be kept clean, not allowing an excessive build up of oil and grease and repair leaks of fluids and oil immediately.**

V. OTHER CONTROLS

1.24. **A. Material Storage, Spill Prevention and Response [§ III.A.9.a]**

Provide a description of the construction materials and chemicals that are expected to be stored onsite, with updates as appropriate. Describe the BMPs that will be provided to ensure proper storage of these construction materials that will minimize their exposure to storm water. Describe the response measures that will be provided if a spill occurs.

Construction materials and chemicals that are expected to be stored on site include:

- **Vehicle fluids, including oil, grease, petroleum and coolants**
- **Asphaltic emulsions associated with Asphalt – Concrete (AC) paving operations**
- **Cement materials associated with Portland cement concrete (PCC)**
- **Base, subbase and aggregate material**
- **Joint and curing compounds**
- **Concrete curing compounds**
- **Paints**
- **Solvents, thinners and acids;**
- **Spent batteries**
- **BMP materials, such as sandbags and fencing**
- **Treated lumber**
- **Gen-tie utility wooden posts**
- **PCC rubble**
- **General litter**

The following BMPs shall be implemented to help prevent discharges of construction materials during delivery, storage and use.

- **A sandbag barrier, swale or berm shall be provided around the storage areas to prevent runon from adjacent areas.**
- **Material delivery and storage areas should be located near the construction entrances, away from drainage swales, if possible.**
- **Watertight containers will be used to store hand tools, small parts and most construction materials that can be carried by hand, such as paint cans, solvents and grease.**
- **Hazardous materials shall be stored in a separate covered storage / containment facility that shall be constructed adjacent to the shipping containers to provide storage for larger items such as drums items shipped or stored on pallets.**
- **Liquids, petroleum products and substances listed in the Code of Federal Regulations (CFR), Title 40, Section 110, 117 and 302 shall be contained within secondary containment.**
- **Very large items, such as framing materials, steel and stockpiled limber will be stored in the open, in the general storage area. Such materials may be elevated with wood**

blocks to minimize contact with run-on.

- **Sufficient separation shall be provided between stored containers to allow for spill clean up and emergency response access.**
- **Incompatible materials shall not be stored in the same temporary facility.**
- **An ample supply of spill cleanup materials shall be maintained and storage in the storage area.**
- **Material safety data sheets (MSDS), a material inventory and emergency contact numbers shall be posted in the area.**
- **Stockpiles of materials (including soil and paving materials, which includes Portland cement concrete, rubble, asphalt concrete, asphalt concrete rubble, aggregate base, aggregate sub-base, pre-mixed aggregate and asphalt binder) shall be surrounded with sediment controls.**
- **Plastic covers shall be used to cover exposed soil stockpiles.**

The following BMPS are for spill prevention and control, which shall be implemented to contain and cleanup spills and prevent material discharges to the storm drain system:

- **Employees and subcontracts shall be familiar with potential environmental impacts resulting from the materials they are handling, which includes all soil and liquid materials (fuels, lubricants, other petroleum distillates, paints, solvents, cement, mortar, soil stabilizers and fertilizers) and regular meetings shall be held to reinforce appropriate disposal procedures. A significant spill is different for different materials as follows:**
  - **Minor Spill: typically small quantities of oil, gasoline and paint that can be controlled by the first responder at the discovery of the spill using absorbent materials.**
  - **Semi Significant Spills: controlled by the first responder with the aid of other personnel such as laborers and foreman. Spills should be cleaned up immediately by containing the spread, notifying the project foreman, and then cleaned up using adsorbent materials or constructing an earth dike. If there is rain, then cover the spill with tarps or other material to prevent contaminating the runoff.**
  - **Significant Spills: Notify local emergency response (dial 911), notify the National Response Center for spills of federal reportable quantities and wait for the experts to assist in the clean up.**
- **Good housekeeping practices shall be implemented to control spills including the use of secondary containment, and designing specific areas to for equipment maintenance.**
- **Adsorbent materials will be kept on site and near active working areas to be used to clean up small spills.**
- **Store and dispose of used clean up materials, contaminated materials and recover spill material that is no longer suitable for use in accordance with the BMPs in Section V.D.**

- **Water used for cleaning and decontamination will not be allowed to enter drainage systems.**
- **Onsite vehicles/equipment and incoming vehicles/equipment shall be regularly inspected for leaking oils and fluids and place drip pans / adsorbent material under paving equipment when not in use.**

1.26. **B. Offsite Vehicle Tracking Controls [§ III.A.9.b]**

Provide a description of the control measures that will be provided to prevent tracking or deposition of sediments offsite and the measures that will be used to remove any sediments that have been deposited on the paved roadways bordering the site.

The following Tracking Control Measures are designed to prevent sediment from the construction site, tracking onto public or private roadways. The Construction Contractor may use the following BMPs as necessary:

- **Stabilize construction entrance / exit**
- **Stabilize construction roadway**
- **Entrance / outlet tire wash**

Stabilize Construction Entrance / Exit

A stabilized construction entrance / exit will be constructed to reduce tracking mud and dirt onto public roads by construction vehicles. BMPs include:

- **Construction entrance/exit shall be a minimum 50 feet long (or at least four times the circumference of the largest construction vehicle tire, which ever is greater) and 30 feet wide, use 3 to 6 inch diameter stones at a minimum depth of 12 inches and may contain corrugates steel panels as rumble racks. If an aggregate is used in the entrance/exit, it shall be placed over a geotextile fabric to at least 12 inches depth or at a depth recommended by a geotechnical engineer.**
- **Appropriate turning radii shall be provided with the exit/entrance.**
- **The surrounding area shall be properly graded to prevent runoff from leaving the construction site.**
- **Construction entrance/exit shall be designed to cater for the heaviest vehicles and equipment that will use it.**
- **All employees, sub contractors and suppliers will be required to use the stabilized entrance/exit.**

Stabilize Construction Roadway

Access roads will be stabilized after grading to prevent erosion and control dust. Under post construction conditions, the access road to the site will be a paved, two lane road with a minimum of two foot shoulders on each side of the road, and provide access to the power block. All the roads within the power block will be surfaced with asphalt. The solar field perimeter road will be groomed and surfaced with approximately 4 to 5 inches of road base. Thus road will the be compacted with a heavy roller to provide all-weather access, and be sloped to allow natural runoff or drainage structures (e.g. culverts) will be installed as

needed. In addition, 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. BMPs include:

- **Stabilization methods shall be used, which may include the application of dust palliatives, gravel asphalt or paving, depending on the final use of the road.**

Entrance / Outlet Tire Wash

A tire wash is located at the stabilized construction entrance/exit and removes sediment from tires and under carriages to prevent sediment from being transported into public roadways. BMPs include:

- **A turnout / wide exit shall be provided to ensure entering vehicles do not drive through the washed area.**
- **A supply of wash water shall be provided and a drainage ditch to convey the runoff to a sediment trapping device.**

1.28. **C. Dust Control [§ III.A.9.b]**

Describe the control measures that will be used to prevent the generation of dust on-site.

The following Wind Erosion / Dust Control Measures are designed to prevent dust nuisance generated by construction activities:

- **Wet Suppression**
- **Chemical Suppression**
- **Transportation**
- **Scheduling**
- **Vegetation**

A Dust Control Plan is required by the NDEP and will be implemented in concordance with this SWPPP. Generally, during windy conditions (forecast or actual wind conditions of approximately 20 miles per hour or greater), dust control will be applied to disturbed areas.

Wet Suppression

Water can be applied to the surface for dust control as well as soil moisture conditioning. The CDSEP Plan of Development (2010) estimates 500 acre-feet of water will be needed in the first year of construction (when a majority of the earth work will be undertaken) and 150 acre-feet of water per year for the following years of construction to meet the dust control and soil moisture conditioning requirements. BMPs include:

- **At least one mobile unit shall be available at all times to apply water (or dust palliative) to the site.**
- **Water shall be applied by means of pressure-type distributors to ensure even distribution.**

Chemical Suppression

Dust palliatives may be used on roadways to suppress the dust from construction transportation or within any other areas that could be disturbed by wind. In accordance with the CDSEP Plan of Development (2010), the approved suppressant will be one that has been applied previously on properties owned by the BLM, and that has been previously reviewed and approved by the Army Corps of Engineers as an acceptable dust palliative. BMPs include:

- **The chemical suppressants should not create adverse effects on stormwater, plant life or groundwater.**
- **The chemical suppression agents shall be applied to the site as per the manufacturer's specifications.**
- **At least one mobile unit shall be available at all times to apply dust palliative (or water) to the site**

Transportation

BMPs for transportation include:

- **Onsite site vehicle speeds shall be limited to 15 miles per hour (mph) when travelling on exposed soil.**
- **All driving areas within the site will be clearly marked with the speed limit.**
- **Trucks that are hauling soil or other loose materials shall be covered or maintain at least two feet of freeboard.**
- **Roadways may be surfaced with gravel asphalt instead of wet/chemical suppression agents.**
- **Equipment wash-out areas will be provided in the laydown areas.**
- **Construction exit/entrance will be installed at the commencement of construction) refer Section V. B for description).**

Scheduling

BMPs for scheduling activities include:

- **Work shall be suspended during high periods of wind if possible.**
- **The number and activities of vehicles on the site at any given time shall be controlled.**
- **The direction of the prevailing wind shall be identified to ensure wind controls are implemented efficiently.**
- **The project schedule will sequence construction activities to limit the amount of areas disturbed at any one time.**

Vegetation

Disturbed areas will be temporarily or permanently stabilized to limit dust emission (refer to Sections IV. B and C).

1.30. **D. Construction Waste Storage and Disposal [§ III.A.9.d]**

Describe the wastes that will be generated onsite. Construction wastes include concrete washout, excess building materials, chemicals, litter and debris. Describe the BMPs that will be used to temporarily store these wastes, how they will be collected and disposed, and the response measures that will be provided if a spill occurs.

Wastes that will be generated during construction that are non hazardous will include:

- **Scrap wood, steel, glass, plastic, paper, insulation (normal refuse)**
- **Scrap metals (in parts / containers)**
- **Waste oil filters from equipment/vehicles (solids)**
- **Fluorescent, mercury vapor lamps (lighting; metals and PCBs - may potentially be hazardous)**
- **Chemical cleaning fluid waste (may potentially be hazardous)**
- **Hydrotest water (may potentially be hazardous)**

The following outlines the disposal BMP procedures for the management of solid waste materials:

- **Designated waste collections areas onsite shall be located at least 50 feet from drainage facilities and not located in areas prone to flooding or ponding.**
- **Solid wastes shall be loaded directly onto trucks for offsite disposal. When onsite storage is necessary, solid wastes will be collected and stored in water tight dumpsters in the general storage area of the laydown area. Solid waste will be removed and disposed offsite at least weekly.**
- **Waste storage areas shall be kept clean, well organized and equipped with ample cleanup supplies as appropriate for the materials being stored.**
- **Toxic liquid wastes will not be disposed of in dumpsters designated for construction debris.**
- **Dumpsters will not be hosed out. That activity shall be undertaken by the trash hauling contractors. However, the area shall be cleaned up immediately if a container does spill.**
- **Stormwater run on shall be prevented from contacting stored solid waste though the use of berms, dikes, or other temporary diversion structures or through the use of measures to elevate waste from site surfaces.**

The following outlines the disposal BMP procedures for the management of liquid waste materials:

- **Employees and subcontractors shall be educated on how to safety differentiate between non-hazardous liquid waste and potential or known hazardous liquid waste.**
- **All generated liquid wastes shall be contained in controlled areas that are structurally sound and leak free, such as in containment areas, holding pits, or portable tanks. Containment devices must be of sufficient quantity or volume to completely contain**

the liquid wastes generated.

- **Liquid waste will not enter any drainage swales or waterways.**
- **Liquid wastes may be dewatered (using the BMPs for Dewatering Operations under Section IV. F) so the solids can be disposed of as per the Solid Waste BMPS.**

Discharges from concrete activity will consist of rinse water and residual concrete (PCC, aggregates, admixture and water). Concrete waste management will be implemented in accordance with contract documents and the following BMPs:

- **Dry and wet materials shall be stored under cover, away from drainage areas.**
- **Excess amounts of fresh concrete shall not be mixed.**
- **Washout of concrete trucks shall be performed offsite or in designated areas only.**
- **Excess concrete will not be allowed to be dumped on site, except in designated areas.**
- **The concrete washout shall be located at least 50 feet from drainage swales, and a bermed area created large enough to contain liquid and solid waste and stormwater run off and runon (typically have a minimum width 10 feet). Generally these are below grade facilities, however above ground facilities can be used if excavation is not practical, and have plastic lining material (minimal 10 mil polyethylene) free of holes, tears, and defects.**
- **Sweepings, PCC and AC waste shall not be discharged into the drainage swales or river.**

1.32. E. Hazardous and Sanitary Waste Storage and Disposal

Provide a description of the hazardous and/or sanitary wastes that are expected to be generated at the site, the measures used to temporarily store these wastes, how they will be collected and disposed and the response measures that will be provided if a spill occurs.

Wastes that will be generated during construction that are hazardous will include:

- **Empty hazardous material containers (drums, containers, totes)**
- **Spent welding materials**
- **Used and waste lube oil (hydrocarbons)**
- **Oily rags, oil sorbent from clean up of small spills (hydrocarbons)**
- **Waste oil from equipment / vehicles (hydrocarbons)**
- **Solvents, paints, adhesives**
- **Spent batteries (heavy metals)**
- **Steam turbine cleaning waste (corrosive cleaning chemical)**

Hazardous waste management will be implemented in accordance with contract documents and the following BMPs:

- **Adequate waste storage volume shall be available and hazardous waste collection containers are to be conveniently located and segregated from non-hazardous**

construction site debris.

- **Wastes shall be stored in sealed containers that are constructed of a suitable material and transported as required under the Code of Federal Regulations and clearly labeled with the material type and date of accumulation.**
- Temporary containment facility should provide for a spill containment volume equal to 1.5 times the volume of all containers able to contain precipitation from a 25 year storm event, plus the greater of 10% of the aggregate volume of all containers or 100% of the capacity of the largest tank within its boundary, whichever is greater.
- **Temporary containment facilities shall be maintained free of accumulated rainwater and spills. In the event of spills or leaks, accumulated rainwater and spills shall be placed into drums after each rainfall, and handled as hazardous waste unless testing determines them to be non-hazardous.**
- **Drums shall not be overfilled and wastes should not be mixed.**
- **Unless watertight, containers of dry waste shall be stored on pallets.**
- **Brushes or rinse paint containers shall not be washed out into the dirt, rather "paint out" brushes as much as possible and dispose of excess solvents and oil-based paints and sludge as hazardous waste.**
- **Wastes shall be disposed of by a licensed hazardous waste transporter at an authorized and licensed disposal facility or recycling facility using hazardous waste manifest forms.**
- **Employees and subcontractors shall be educated on hazardous waste storage and disposal procedures, dangers to human and environment and the safety requirements. Warning signs should be placed in areas recently treated with chemicals.**

Septic waste management will be implemented in accordance with contract documents and the following BMPs:

- **Facilities shall be located away from drainage facilities and from traffic circulation.**
- **When subjected to high winds, temporary facilities shall be secured to prevent overturning.**
- **Wastewater shall be collected by a licensed sanitary and septic waste hauler and comply with local health agency regulations. Wastewater should not be discharged or buried within the project site unless approved by the local health agency.**
- **Sanitary and septic systems shall be maintained in good working order by a licensed service.**
- **Employees, subcontractors and suppliers shall be educated on the waste storage and disposal procedures, potential dangers to humans and the environment.**

1.34. **F. Offsite Discharges [§ III.A.9.e]**

Provide a description of the potential offsite pollutant sources and the BMPs that will be provided to minimize storm water pollution from these sites. Offsite sources may

include dedicated sites such as asphalt or concrete plants.

A batch plant will be provided on CDSEP site. A batch plant facility generally consists of silos containing fly ash, lime and cement; heated tanks of liquid asphalt, sand and gravel material storage areas, mixing equipment, above ground storage tanks containing chemical additives and water and designated areas for sand and gravel unloading, concrete truck loading and concrete truck washout. Batch Plant management will be implemented in accordance with contract documents and the following BMPs:

- **The facility will be located in the temporary laydown area or in the heliostat field, however the final location must be away from drainage courses and drainage inlets. Runoff from within the batch plant (paved or unpaved) will be directed into a sump for appropriate disposal (refer Section V.D).**
- **Continuous interior AC or PCC berms will be constructed around batch plant equipment to facilitate containment and cleanup of releases. Rollover / flip top curb / dikes may be placed at ingress and egress points.**
- **Fabric filters can be used to aid in transfer of dry material and on dry silos and silo vent filters to be maintained in proper operating condition.**
- **Silos to be equipped with visible and / or audible warning mechanisms to warn operators when the silo or trailer is full.**
- **Dust emissions from the loading of open-bodied trucks at the drop point of dry batch plants, or dust emissions from the drum feed for central mix plants.**
- **Concrete Waste shall be managed as per the BMPS listed in Section V.D)**

Aggregate material for construction will be obtained from a local borrow area, rather than within the project excavation. The following BMPs will be implemented before material is withdrawn from that site:

- **Structural BMPs (refer Section IV.D) including a silt fence around topsoil piles, covering of soil stockpiles before rain events / high wind events, and using sand bags hold covers in place.**
- **Tracking Control BMPs (refer Section V.B) to ensure that sediment is not tracked off the borrow pit site and onto the local roads, therefore this may include a stabilized construction entrance/exit BMP.**

1.36. **G. Soil Stabilization at Culverts [§ III.A.9.c]**

Provide a description of the measures used to sufficiently stabilize soil at culvert locations to prevent the formation of rills and gullies during construction.

VDDs will be installed at culverts to reduce the velocity of stormwater and prevent rills and gullies being formed (refer to Section IV. D for description). Sounding soil shall be stabilized as per the BMPs outlined in the Temporary Soil Stabilization Section (Section IV.B)

VI. INSPECTION / MAINTENANCE PROCEDURES

The contractor or his qualified agent is required to routinely inspect all areas of disturbed and bare soil, areas used for storage of materials and equipment that are exposed to precipitation, onsite vehicle entrance and exit locations and all onsite erosion and sediment control BMPs. Inspectors must also observe discharge locations to receiving waters to ensure proper operation of sediment and erosion control measures. **Inspections shall occur weekly, prior to forecasted rain events, and within 24 hours after any actual rain event of 0.5 inches or greater.** Sediments must be removed when the BMP design capacity has been reduced to 50%. Construction materials, chemicals, wastes, litter and debris must be prevented from becoming a storm water pollutant source. When sediment escapes the construction site, off-site accumulations of sediment must be removed to ensure no adverse effects on water quality and public safety [§ III.A.4]

The following sources may be used to obtain weather forecasts:

- The National Weather Service: Telephone: (775) 673-8100, **http://www.wrh.noaa.gov/Reno/**
- The Western Regional Climate Center, **http://www.wrcc.dri.edu/CURRENTOBS.html**
- The Weather Channel, **http://www.weather.com/weather/local/USNV0076?from=search_city**

Once storms are imminent, a portable NOAA weather radio can also provide useful information. NOAA weather radio broadcasts are made on one of seven high-band FM frequencies. These frequencies are typically available only on radios that provide a "weather band" as an added feature or portable weather radios that exclusively provide weather broadcasts. The local FM frequency for the Reno/Sparks area is 162.500 MHz. Taped weather messages are repeated every four to six minutes and are routinely revised at least once every one to three hours, 24 hours daily.

1.38. **A. Inspection and Maintenance of Best Management Practices [§III.A.11-12]**
Provide a description of the practices that will be used to inspect and maintain all Temporary and Permanent Stabilization Practices Structural Practices, Post-Construction Storm Water Management Controls and Non-Storm Water Discharges described in Section IV, above. Maintenance shall be performed if any BMP is not operating effectively or if the capacity has been reduced by 50%. Maintenance must be conducted as soon as practicable and before the next anticipated storm event.
a) Inspection Requirements **All Erosion and Sediment Control BMPS to be inspected prior to forecast rain, daily during extended rain events, after rain events, and weekly during construction.** **Non-Stormwater Management BMPs to be inspected prior to the commencement of the activities and while activities associated with the BMP are underway.**

b) Maintenance Requirements

Scheduling:

- **Verify that the work is progressing in accordance with the construction schedule and amend if when changes are warranted (rainy season).**

Temporary Stabilization Practices

General

- **Areas were erosion is evident shall be repaired and BMPs re-applied as soon as possible. Care should be taken to minimize damage to protected areas while making repairs, as any area damaged will require re-application of BMPs.**

Preservation of existing vegetation

- Verify that protective measures remain in place (i.e. temporary fencing) and restore damaged protective measures immediately.
- Retain protective measures until all other construction activity is complete to avoid damage during site cleanup and stabilization.

Hydraulic/Straw Mulch:

- **Maintain an unbroken, temporary mulched ground cover throughout the period of construction when soils are not being reworked.**
- **Reapplication of mulch may be required to maintain effective soil stabilization over disturbed areas and slopes.**

Soil Binders

- Reapply the selected soil binder as needed to maintain effectiveness.

Geotextiles and Mats

- If washout or breakage occurs, re-install the material after repairing the damage to the slope of change.
- Insure the matting is uniformly in contact with the ground.
- Check that all lap joints are secure.

Equipment Selection

- Inspect the equipment used as per the Vehicle and Equipment cleaning/fueling and maintenance section.

Structural Controls

Earth Dikes / Drainage Swales

- Inspect ditches and berms for washouts. Replace lost riprap or soil stabilizers as needed.
- Inspect embankments, and beds of ditches and berms for erosion and accumulation of

debris and sediment and repair linings and embankments as needed.
- Temporary conveyances should be completely removed as soon as the surrounding drainage area has been stabilized or at the completion of construction.

Velocity Dissipation Devices
- Inspect apron for displacement of the rip rap and damage to the underlying fabric. Repair fabric and replace rip rap that has washed away. If riprap continues to wash away, consider using larger material.
- Inspect for scour beneath the riprap and around the outlet. Repair damage to slopes and underlying filter fabric immediately.
- Temporary devices should be completed removed as soon as the surrounding drainage area has been stabilized or at the completion of construction.

Silt Fence
- Repair undercut silt fences.
- Repair or replace split, torn, slumping or weathered fabric (general lifespan of a silt fence is 5 to 8 months).
- Sediments should be removed when the sediment accumulation reaches one-third of the barrier height.
- Holes, depressions, or other ground disturbance caused by the removal of the silt fences should back filled and repaired.
- Silt fences should be left in place until the upstream areas is permanently stabilized. Until then, the silt fence is to be inspected and maintained.

Sediment Basin
- Examine basin banks for seepage and structural soundness.
- Check inlet and outlet structures and spillway for any damage or obstructions. Repair damage and remove obstructions as needed.
- Check inlet and outlet area for erosion and stabilize if required.
- Check fencing for damage and repair as needed.
- Remove standing water from the basin within 72 hours of accumulation.
- Sediment should be removed when the sediment accumulation reaches one-half of the volume. Sediment removed during maintenance may be incorporated.
- To minimize vector production, the accumulation of live and dead floating vegetation in basins should be removed during every inspection.

Sediment Trap
- Inspect outlet area for erosion and stabilize if required.
- Inspect trap banks for seepage and structural soundness, repair as needed.
- Inspect outlet area structure and spillway for any damage or obstructions. Repair damage and remove obstructions as needed.
- Inspect sediment trap for area of standing water during each visit. Corrective measures should be taken if the BMP does not dewater completely in 72 hours or less to prevent

vector production.
- Removal from vegetation from the sediment trap when first detected to prevent pools of standing water and subsequent vector production.
- BMPs that require dewatering shall be continuously attended while dewatering takes place.

Check Dams
- Replace missing rock, bags, bales etc. Replace bags or bales that have degraded or become damaged.
- Sediment should be removed when the sediment accumulation reaches one-third of the barrier height.
- If the check dam is used for grade control only, sediment removal is not required as long as the system continues to control the grade.
- Remove accumulated sediment prior to permanent seeding or soil stabilization.
- Remove check dam and accumulated sediment when check dams are no longer needed.

Fiber Rolls
- Replace or repair split, torn, unraveling or slumping fiber rolls.
- Sediments should be removed when the sediment accumulation reaches one-third of the barrier height.

Gravel Bag Berms / Sand Bags
- Reshape or replace bags as needed (gravel/sand bags exposed to sunlight will need to be replaced every two to three months due to degrading of the bags).
- Repair washouts or other damage as needed.
- Sediments should be removed when the sediment accumulation reaches one-third of the barrier height.
- Remove bag berms when no longer needed. Remove sediment accumulation and clean / re-grade and stabilize area.

Storm Drain Inlet Protection
- Refer to the silt fences and gravel/sand bags sections for maintenance requirements including replacement of fabric in fences when clogged, torn or degraded, and removal of sediment when sediment accumulation reaches one third of the barrier height.

Non-Stormwater Management Controls

Illicit Connection / Discharge
- Ensure there is no evidence of illicit discharges or illegal dumping on the project site.
- Prohibit employees and subcontractors from disposing of non-job related debris of materials at the construction site.
- Notify the owner of any illicit connections and illegal dumping or discharge incidents at the time of discovery.

Water Conservation Practices

- Repair water equipment as needed to prevent unintended discharges.

Dewatering Practices

- **Refer to manufacturing specifications as it should include unit specific maintenance requirements.**
- **Maintain surrounding features such as safety fencing and vegetation.**
- **Sediment removed during the maintenance of a dewatering device may be either spread onsite and stabilized, or disposed of at a disposal site. If the sediment is comingled with other pollutants, must be disposed of in accordance with all applicable laws and regulations.**

Paving and Grinding Operations

- **Keep ample supplies of drip pans and absorbent materials.**
- **Inspect and maintain machinery to minimize leaks and drips.**

Piling Operations

- **Inspect equipment every day at startup and repair equipment as needed (i.e., worn or damaged hoses, fittings and gaskets). Recheck equipment at shift changes or at the end of the day and schedule repairs as needed.**

Concrete Curing and Finishing

- **Ensure that employees and subcontractors implement measures for storage, handling and use of curing compounds.**
- **Inspect cure containers and spraying equipment for leaks.**
- **At the end of each work shift, remove and contain liquid and solid waste from containment structures, if any, and from the general work area (sweep or vacuum).**

Vehicle and Equipment Cleaning

- **Ensure cleaning areas is located at least 50 feet from drainage facilities and protected from run-on and runoff.**
- **Ensure that employees and contractors implement appropriate measures for containment.**
- **Maintain berm integrity.**
- **Inspect sump regularly and remove liquids and sediment as needed.**
- **Ensure no soaps, soap substitutes, solvents or steam is used for washing.**
- **Prohibit employees and subcontractors from washing personal vehicles and equipment on the construction site.**

Vehicle and Equipment Fueling

- **Ensure fueling areas is located at least 50 feet from drainage facilities and protected from run-on and runoff.**
- **Maintain berm integrity.**
- **Leaks should be repaired immediately or problem vehicles or equipment should be removed from the site.**
- **Keep ample supplies of spill clean up materials onsite.**
- **Immediately clean up spills and properly dispose of contaminated soil and cleanup materials.**

Vehicle and Equipment Maintenance

- **Ensure maintenance areas is located at least 50 feet from drainage facilities and protected from run on and runoff.**
- **Keep ample supplies of spill clean up materials onsite.**
- **Maintain waste fluid containers in a leak proof condition.**
- **Vehicles and equipment should be inspected each day of use. Leaks should be repaired immediately or the problem vehicles or equipment removed from the site.**
- **Inspect equipment for damage hoses and leaky gaskets routinely. Repair or replace as needed.**

1.40. **B. Inspection and Maintenance of Other Controls [§III.A.11-12]**

Provide a description of the practices that will be used to inspect and maintain all Other Controls described above in Section V,

a) Inspection

Non-Stormwater Management BMPs to be inspected prior to the commencement of the activities and while activities associated with the BMP are underway.

b) Maintenance

Material Storage and Spill Prevention

- **Ensure material storage areas and washout areas are protected from run-on and run-off and located at least 50 feet from concentrated flows and downstream drainage facilities.**
- **Spot check employees and subcontractors throughout the job to ensure appropriate practices are being employed.**
- **Ensure bagged and boxed materials are stored on pallets.**
- **Ensure containment facilities are free of spills and rainwater.**
- **Keep ample supplies of spill control and cleanup materials onsite, near storage and unloading and maintenance areas.**

- **Repair or replace perimeter controls, containment structures, covers, and liners as needed to maintain proper function.**
- **Update the CDSEP Spill Prevention Plans (i.e. Spill Prevention Countermeasure and Control Plan) and stock materials as changes occur in the types of chemicals onsite.**

Offsite Vehicle Tracking Controls

- **Remove accumulated sediment from wash rack / or sediment trap to maintain system performance.**
- **Inspect routinely for damage and repair as needed and replace gravel material with surface voids are visible.**
- **Inspect that the paved local roads areas are free of visible sediment tracking and other particular matter.**
- **Inspect the sediment build up on the rock in the construction entrance/exit to see if sediment or rock removal is necessary.**
- **Keep all temporary roadway ditches clear.**

Dust Control

- **Check areas protected to ensure coverage.**
- **Most dust control measures require frequent, often daily, or multiple times per day attention.**

Construction Waste Material and Disposal

- **Inspect construction waste area regularly.**
- **Arrange for a regular waste collection.**
- **Ensure the site is free of litter.**

Hazardous and Sanitary Waste Storage and Disposal

- **Arrange for regular waste collection.**
- **Comply with federal, state and local laws regarding storage, handling, transportation, and disposal of hazardous wastes.**
- **A foremen / construction supervisor should monitor onsite hazardous waste storage and disposal procedures.**
- **Waste storage areas to be kept clean, well organized, and equipped with ample cleanup supplies as appropriate for the materials being stored.**
- **Perimeter controls, containment structures, covers and liners should be repaired or replaced to maintain proper function.**
- **Hazardous spills should be cleaned up and reported in conformance with applicable MSDS and the instructions posted at the site.**
- **The National Response Centre should be notified of spills of federal reportable**

quantities in conformance with the requirements in 40 CFR parts 110, 117 and 302.

- **A copy of the hazardous waste manifest is to be kept.**
- **If high winds are expected, portable sanitary facilities must be secured with spikes or weighed down to prevent turning.**

Offsite discharges

- **Inspect and repair equipment as necessary (for damaged hoses, fittings and gaskets).**
- **Temporary concrete washout facilities should be maintained to provide adequate holding capacity within a minimum freeboard 4 inches for above ground facility and 12 inches for below ground facilities. Maintain wash out facilities by removing and disposing of hardened concrete and return the facilities to a functional condition. Hardened concrete materials should be removed and disposed of.**
- **Washout facilities must be cleaned, or new facilities must be constructed and ready for use once the washout is 75% full.**
- **Ensure washout facilities liners are free from punches and holes and being used as designed.**

1.42. C. Inspector Qualifications [§III.A.12c]

Describe the qualifications of the person(s) selected to inspect the BMPs discussed above. "Qualified Personnel" means someone knowledgeable in the principles and practice of erosion and sediment control who possess the skills necessary to assess the site conditions and the effectiveness of BMPs.

The Contractor Storm Water Pollution Prevention Manager (SWPPM) assigned to this project is:

Name: _____

Telephone Number: _____

Contractor's Company Name: _____

Contactor's Company Address: _____

_____

Qualifications: _____

_____

_____

VII. CERTIFICATIONS OF COMPLIANCE

This SWPPP must be certified that it is consistent with all applicable Federal, State and Local regulations, or other approved site plans or permits. It is to be prepared in accordance with the latest version of the Truckee Meadows Construction Site Best Management Practices Handbook. This SWPPP must be updated as necessary to remain consistent with changes in other site plans that effect soil disturbing activities, site drainage patterns or any other activity that may impact storm water runoff quality. It must also be re-certified annually by July 1 until the construction project is complete and a Notice of Termination has been submitted to NDEP.

1.44. **A. OWNER/OPERATOR CERTIFICATION STATEMENT [§ V.B.1.d]**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. I also confirm that a storm water pollution prevention plan (SWPPP) has been completed, will be maintained at the project site from the start of construction activities, and that the SWPPP will be compliant with any applicable local sediment and erosion control plans. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines for knowing violations.

Initial Certification:	
Print Name: **Miguel Carlos Vinado** 1. **EPC Contractor - Cobra Thermosolar Plants**	Title: **Crescent Dunes Solar Project Director**
Signature:	Date: **June 23rd 2011**
Annual Re-Certification	
Print Name:	Title:
Signature:	Date:

All contractors and subcontractors responsible for implementing pollution control measures must be identified in this SWPPP with the measures for which they are responsible. They must also sign the following certification statement that indicates they understand the requirements of the attached General Permit for Construction Activities (Attach additional sheet if necessary for additional contractors).

1.45. **B. CONTRACTOR'S CERTIFICATION STATEMENT**

I certify under penalty of law that I understand the terms and conditions of the State's General Permit (NVR100000) that authorizes storm water discharges associated with industrial activity from the construction site identified as part of this certification.

Company 1		
Name:		Phone:
Address:		
City:	State:	Zip:
Print Name:		Title:
Signature:		Date:
Company 2		
Name:		Phone:
Address:		
City:	State:	Zip:
Print Name:		Title:
Signature:		Date:
Company 3		
Name:		Phone:
Address:		
City:	State:	Zip:
Print Name:		Title:

Signature:	Date:

VIII. RECORDS OF INSPECTION AND CONSTRUCTION ACTIVITIES

1.46. **A. Record of Major Construction Activities and BMP Implementation [§**
Provide the dates of when major grading activities occur, the dates when construction activities on a portion of a site temporarily or permanently cease, and list the dates when temporary and permanent stabilization practices are implemented. Photo documentation of major construction activities and implementation of BMPs is strongly recommended.
Attachment B contains the dates of major grading activity records and photo documentation or the construction activities and implementation of BMPs.
1.48. **B. Record of Construction Site Inspections [§ III.A.12.e-f]**
Provide a record of inspection reports to include the name and qualifications of person making the inspections, the dates of inspection, and major observations relating to the implementation of the SWPPP. Major observation should include the location(s) of discharges of sediment or other pollutatnts from the site, location(s) of BMPs that need to be maintained, location(s) of BMPs that failed or proved to be inadequate, and location(s) where additional BMPs are needed. All issues of non-compliance shall be noted. If the site is in full compliance with this SWPPP and permit NVR100000 on the date of inspection, the report shall contain a certification of compliance. These records shall be retained as part of the SWPPP for at least three years from the date that permit coverage expires or the site is finally stabilized.
Attachment C contains a template for Construction Site Inspections, and the records from site inspections.
1.50. **C. Record of Follow-up Actions**
Based on the results of the inspections conducted above, provide a record of the follow-up maintenance and corrective actions conducted at the site. Implementation of follow-up actions should occur within seven (7) days following receipt of inspection results or prior to the next anticipated storm event.
Attachment C contains the record of follow-up actions required and corrective actions implemented.

IX. REFERENCES

- **California Stormwater Quality Association (2003), California Stormwater BMP Handbook, January**
- **Kennedy / Jenks Consultants (2003), Truckee Meadows Construction Site Best Management Practices Handbook, Truckee Meadows Stormwater Permit Coordinating Committee with the City of Reno, February**
- **Kennedy / Jenks Consultants (2008), Nevada Contractors Field Guide for Construction Site Best Management Practices (BMPs), Nevada Division of Environmental Protection, June**
- **Tonopah Solar Energy LLC (2009), Plan of Development for Crescent Dunes Solar Energy Project, May 15 2009**

ATTACHMENT A – SEDIMENT BASIN SIZING

This calculation was created as replacement to Worley Parsons' Appendix A – Sediment Basin Sizing in the Storm Water Pollution Prevention Plan (SWPPP) created previously for Solar Reserve and the Crescent Dunes Solar Energy Project (CDSEP). Worley Parsons' Appendix A provided a calculation for the preliminary sizing of sedimentation basins; however, upon review of the SWPPP by the Bureau of Land Management (BLM), it was recommended that a different approach be used to determine runoff rates to the sedimentation basins. The calculations below have been performed based on the BLM recommendation using the National Resource Conservation Service (NRCS) publication Technical Release 55, June 1986 (TR-55) as the main reference and all figure and table references are from that document.

Flow Calculations - Runoff calculated using the SCS Curve Number method

Site Curve Number (CN)

Pre construction 63 Natural Desert – TR-55 Table 2-2a and 2-2d
Construction 77 Newly Graded – TR-55 Table 2-2a
Area 1620 Acres

Potential Max Retention

$S = 1000/CN - 10$
$S = 1000/77 - 10 = 2.99$ in Construction

Initial Abstraction

$I_a = 0.2S$
$I_a = 0.2 * 2.99in = 0.60$ in Construction

Rainfall

P = 0.96 in 2 year return period for a 24 hour storm
NOAA Atlas 14 (0.96)

Site Flow

$Q = (P-I_a)^2/((P-I_a)+S)$
$Q = (0.96-0.60)^2/((0.96-0.60)+2.99) = 0.0387$ in

Time Calculations – Runoff and Peak calculations

Sheet flow

$T_1 = 0.007(nL)^{0.8}/P_2^{0.5}S^{0.4}$
n = 0.05 TR-55 Table 3-1, During Construction
L = 300 ft Max flow length for Sheet Flow
P_2 = 0.96 in 2 year, 24 hour storm (NOAA)
S = 0.013 ft/ft Slope
$T_1 = 0.007(0.05*300)^{0.8}/0.96^{0.5}0.013^{0.4} = 0.35$ hr

Concentrated Shallow Flow

$T_2 = L/3600V$

L = 10400 ft
V = 1.8 ft/sec (TR-55 Figure 3-1, median slope of 0.013 ft/ft)
T_2 = 10400/3600(1.8) = 1.60 hr

Time of Concentration
$T_c = \sum T_i$
$T_c = T_1 + T_2 = 0.35 + 1.60 = 1.95$ hr

Peak Flow Calculations

$q_p = q_u A_m Q F_p$ Where q_p is the peak discharge in cfs
q_u = Unit Peak Discharge = 125 (exhibit 4-II)
A_m = Drainage Area (mi^2) = 2.53 mi^2
Q = 0.0387 in from above
F_p = Pond and Swamp Adjustment factor = 1.0 (no swamps)
q_p = 125*2.53*0.0387*1.0 = 12.24 cfs

Storage Calculations

Pre-construction runoff is negligible at the CDSEP site. Where typically sedimentation basins are sized to allow flow out equal to the pre-construction rate, for the CDSEP the basins will be sized based on little to no flow through.

$V_s = V_r(V_s/V_r)$
V_s = Storage volume (acre-ft)
V_r = Runoff volume (acre-ft)
$V_r = 53.33QA_m = 53.33*0.0387*2.53 = 5.2$ acre-ft
V_s/V_r = Volume ratio (Figure 6-1)
$V_s/V_r = 1.0$

As the ratio of outflow to inflow nears zero, the ratio of storage to runoff volume is approaches to be 1.0

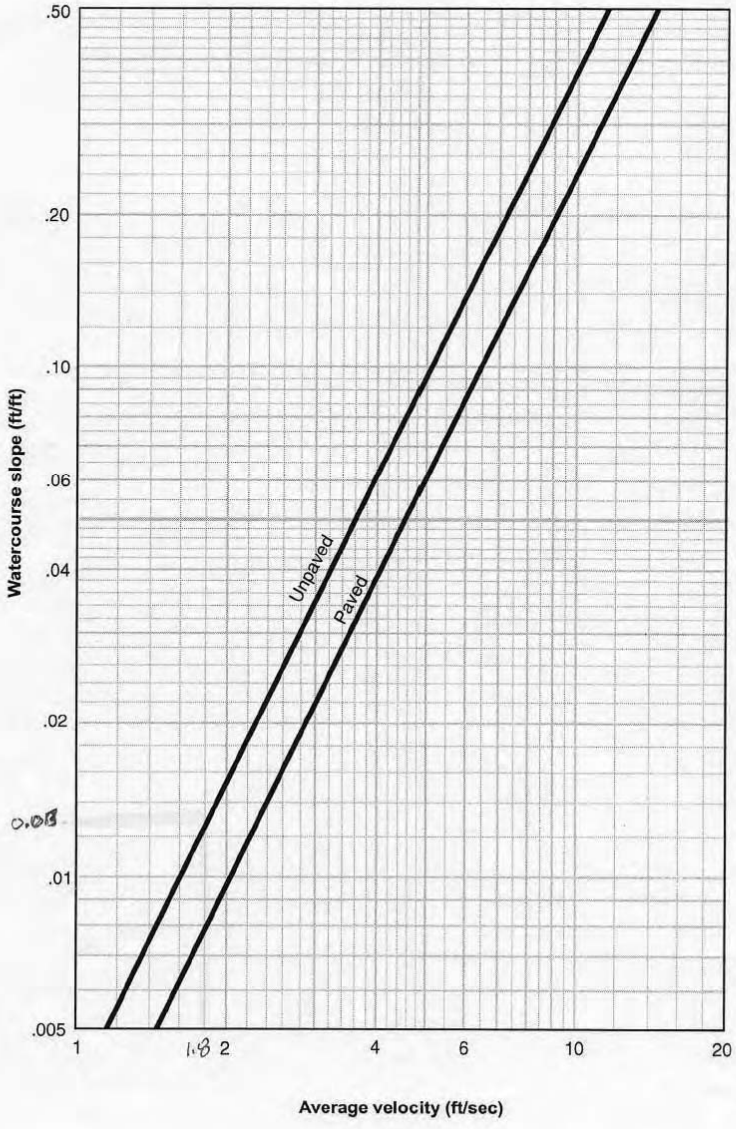
V_s =5.0*1.0 = 5.2 acre-ft

Preliminary required storage for the sedimentation basin for the CDSEP site during construction, assuming a useable depth of 3 feet, basin area equals 1.7 acres.

Conclusion

The results from the NRCS TR-55 calculation recommended by the BLM produced a sedimentation basin volume of 5.2 acre-ft, which is less than the volume calculated in Appendix A of the SWPPP of 17.35 acre-ft. The primary differences in the calculations are the approaches to calculating the maximum flow rate and pond volume, which are based on different methods in determining the Time of Concentration.

Figure 3-1 Average velocities for estimating travel time for shallow concentrated flow



ATTACHMENT B – RECORD OF MAJOR CONSTRUCTION ACTIVITIES

INSERT INFORMATION HERE

ATTACHMENT C – INPSECTION CHECK LIST AND FOLLOW UP ACTIONS

INSPECTION CHECKLIST

GENERAL INFORMATION

Project Name	**Crescent Dunes Solar Energy Project**			
Project No				
Contractor				
Inspector's Name				
Inspector's Title				
Signature				
Date of Inspection				
Inspection Type (Check Applicable)	❒ Prior to forecast rain		❒ After a rain event	
	❒ 24-hr intervals during extended rain		❒ Other _____	
Season (Check Applicable)	❒ Rainy		❒ Non-Rainy	
Storm Data	Storm Start Date & Time:		Storm Duration (hrs):	
	Time elapsed since last storm (Circle Applicable Units)	Min. Hr. Days	Approximate Rainfall Amount (inches)	

PROJECT AREA SUMMARY AND DISTURBED SOIL AREA (DSA) SIZE

Total Project Area _____ Acres

Field Estimate of Active DSAs _____ Acres

Field Estimate of Non-Active DSAs _____ Acres

INSPECTION OF BMPs

BMP / REQUIREMENT	Yes	No	N/A	Corrective Action
Preservation of Existing Vegetation				
Is temporary fencing provided to preserve vegetation in areas where no construction activity is planned?				
Location:				
Location:				
Location:				
Location:				
Erosion Control				
Does the applied temporary erosion control provide 100% coverage for the affected areas?				
Are any non-vegetated areas that may require temporary erosion control?				
Is the area where erosion controls are used required free from visible erosion?				
Location:				
Location:				
Location:				
Location:				
Temporary Linear Sediment Barriers (Silt Fence, Fiber Rolls, Sandbag Barriers, etc.)				
Are temporary linear sediment barriers properly installed, functional and maintained?				
Are temporary linear sediment barriers free of accumulated litter?				
Is the built-up sediment less than 1/3 the height of the barrier?				
Are cross barriers installed where necessary and properly spaced?				
Location:				
Location:				
Location:				
Location:				
Location:				
Desilting Basins				
Are basins maintained to provide required retention/detention?				
Are basin controls (inlets, outlets, diversions, weirs, spillways and racks) in working order?				
Location:				
Location:				
Location:				
Stockpiles				
Are all locations of temporary stockpiles, including soil, hazardous waste, and construction materials in approved areas?				

INSPECTION OF BMPs

BMP / REQUIREMENT	Yes	No	N/A	Corrective Action
Are stockpiles protected from run-on, run-off from adjacent areas and from winds?				
Are stockpiles located at least 50 ft from concentrated flows, downstream drainage courses and storm drain inlets?				
Are required covers and/or perimeter controls in place?				
Location:				
Location:				
Location:				
Tracking Control				
Are points of ingress/egress to public/private roads inspected, swept, and vacuumed daily?				
Are all paved areas free of visible sediment tracking or other particulate matter?				
Is rock at Temporary Construction Entrance(s) 12-inches or more in thickness?				
Does sediment need to be removed from the rock, or does the rock need to be replaced?				
For Type 2 Construction Entrance, does sediment need to be removed from ribbed plates?				
Location:				
Location:				
Location:				
Wind Erosion Control				
Is dust control implemented?				
Location:				
Location:				
Location:				
Vehicle & Equipment Fueling, Cleaning, and Maintenance				
Are vehicle and equipment fueling, cleaning and maintenance areas reasonably clean and free of spills, leaks, or any other deleterious material?				
Are vehicle and equipment fueling, cleaning and maintenance activities performed on an impermeable surface in dedicated areas?				
If no, are drip pans used?				
Are dedicated fueling, cleaning, and maintenance areas located at least 15 m away from downstream drainage facilities and watercourses, and protected from run-on and runoff?				
Is wash water contained for infiltration/ evaporation and disposed of outside the highway right of way?				
Is on-site cleaning limited to washing with water (no soap, soaps substitutes, solvents, or steam)?				
On each day of use, are vehicles and equipment inspected for leaks and if necessary, repaired?				
Location:				

INSPECTION OF BMPs

BMP / REQUIREMENT	Yes	No	N/A	Corrective Action
Location:				
Location:				
Waste Management & Materials Pollution Control				
Are material storage areas and washout areas protected from run-on and runoff, and located at least 50 ft from concentrated flows and downstream drainage facilities?				
Are all material handling and storage areas clean; organized; free of spills, leaks, or any other deleterious material; and stocked with appropriate clean-up supplies?				
Are liquid materials, hazardous materials, and hazardous wastes stored in temporary containment facilities?				
Are bagged and boxed materials stored on pallets?				
Are hazardous materials and wastes stored in appropriate, labeled containers?				
Are proper storage, clean-up, and spill-reporting procedures for hazardous materials and wastes posted in open, conspicuous and accessible locations adjacent to storage areas?				
Are temporary containment facilities free of spills and rainwater?				
Are temporary containment facilities and bagged/boxed materials covered?				
Are temporary concrete washout facilities designated and being used?				
Are temporary concrete washout facilities functional for receiving and containing concrete waste and are concrete residues prevented from entering the drainage system?				
Do temporary concrete washout facilities provide sufficient volume and freeboard for planned concrete operations?				
Are the temporary concrete washout facilities' PVC liners free from punctures and holes?				
Are concrete wastes, including residues from cutting and grinding, contained and disposed of off-site or in concrete washout facilities?				
Are spills from mobile equipment fueling and maintenance properly contained and cleaned up?				
Is the site free of litter?				
Are trash receptacles provided in the Contractor's yard, field trailer areas, and at locations where workers congregate for lunch and break periods?				
Is litter from work areas within the construction limits of the project site collected and placed in watertight dumpsters?				
Are waste management receptacles free of leaks?				
Are the contents of waste management receptacles properly protected from contact with storm water or from being dislodged by winds?				
Are waste management receptacles filled at or beyond capacity?				
Location:				
Location:				
Location:				
Illicit Connection/Illegal Discharge Detection and Reporting				

INSPECTION OF BMPs

BMP / REQUIREMENT	Yes	No	N/A	Corrective Action
Is there any evidence of illicit discharges or illegal dumping on the project site?				
If yes, has the Engineer been notified?				
Location:				
Location:				
Location:				
Discharge Points				
Are discharge points and discharge flows free from noticeable pollutants?				
Are discharge points free of any significant erosion or sediment transport?				
Location:				
Location:				
Location:				
WPCP/SWPPP Update				
Do the WPCP/SWPPP, Project Schedule/Water Pollution Control Schedule and WPCDs adequately reflect the current site conditions and contractor operations?				
Are all BMPs shown on the WPCDs installed in the proper location(s) and according to the details for the plan?				
Location:				
Location:				
Location:				
General				
Are there any other potential water pollution control concerns at the site?				
Location:				
Location:				
Location:				
Storm Water Monitoring				
Were there any BMPs not properly implemented, or breaches, malfunctions, leakages or spills observed, which could result in the discharge of pollutants to surface waters that would not be visually detectable in storm water?				
Did storm water contact stored materials or waste and resulted in a discharge from the construction site? (Materials not in watertight containers, etc.)				
If yes, were samples for non-visually detectable pollutants collected pursuant to the sampling and analysis plan during rain events?				

ATTACHMENT 3

SURFACE DISTURBANCE AIR QUALITY PERMIT

Nevada Department of Conservation and Natural Resources • Division of Environmental Protection
BUREAU OF AIR POLLUTION CONTROL
901 SOUTH STEWART STREET SUITE 4001
CARSON CITY, NEVADA 89701-5249
p: 775-687-9350 • www.ndep.nv.gov/bapc • f: 775-687-6396

Facility ID No. A1205 *Permit No.* AP4911-2765

CLASS II AIR QUALITY OPERATING PERMIT
SURFACE AREA DISTURBANCE

Issued to: Tonopah Solar Energy, LLC. (HEREINAFTER REFERRED TO AS PERMITTEE)
Mailing Address: 2425 OLYMPIC BLVD SUITE 500 EAST, SANTA MONICA, CALIFORNIA 90404
Physical Address: THE SITE IS NEAR STATE HIGHWAY 89, 13 MILES NORTHWEST OF TONOPAH. SOUTH OF THE ANACONDA-MOLY SUBSTATION ON THE EAST SIDE OF HIGHWAY 89.
Driving Directions: FROM TONOPAH, NEVADA DRIVE WEST ON HIGHWAY 6, TURN NORTH ON HIGHWAY 89. THE SITE IS APPROXIMATELY 10 MILES NORTH OF THE INTERSECTION.
General Facility Location:

SECTIONS 2, 3, AND 4, T 4N, R 41E, MDB&M
SECTIONS 2, 11, 14, 15, 19, 21, 22, 27, 28, 33, 34, AND 35, T 5N, R 41E, MDB&M
(HA 137A– BIG SMOKEY VALLEY AREA) (NYE COUNTY)
NORTH 4,233.84 KM, EAST 468.24 KM, UTM (ZONE 11) – NAD 83

Section I. General Conditions

A. Severability (Nevada Administrative Code (NAC) 445B.315.3(c))
Each of the conditions and requirements of this Operating Permit is severable and, if any are held invalid, the remaining conditions and requirements continue in effect.

B. Prohibited Acts (Nevada Revised Statute (NRS) 445B.470)
Permittee shall not knowingly:
1. Violate any applicable provision, the terms or conditions of any permit or any provision for the filing of information;
2. Fail to pay any fee;
3. Falsify any material statement, representation or certification in any notice or report; or
4. Render inaccurate any monitoring device or method, required pursuant to the provisions of NRS 445B.100 to 445B.450, inclusive, or 445B.470 to 445B.640, inclusive, or any regulation adopted pursuant to those provisions.

C. Prohibited Conduct: Concealment of Emissions (NAC 445B.225)
Permittee shall not install, construct, or use any device which conceals any emission without reducing the total release of regulated air pollutants to the atmosphere.

D. Compliance/Noncompliance (NAC 445B.315.3(d))
Permittee shall comply with all conditions of this Operating Permit. Any noncompliance constitutes a violation and is grounds for:
1. An action for noncompliance;
2. Modifying, revoking, reopening and revising, or terminating the Operating Permit; or
3. Denial of an application for a renewal of the Operating Permit.

E. NAC 445B.315.3(e)
The need to halt or reduce activity to maintain compliance with the conditions of this Operating Permit is not a defense to noncompliance with any conditions of this Operating Permit.

F. NAC 445B.315.3(f)
The director may revise, revoke and reissue, reopen and revise, or terminate the operating permit for cause.

G. NAC 445B.315.3(g)
This Operating Permit does not convey any property rights or any exclusive privilege.

H. NAC 445B.315.3(h)
Permittee shall provide the Bureau of Air Pollution Control, within a reasonable time, with any information that the Bureau of Air Pollution Control requests in writing to determine whether cause exists for revising, revoking and reissuing, reopening and revising or terminating this Operating Permit or to determine compliance with the conditions of this Operating Permit.

Issued to: TONOPAH SOLAR ENERGY, LLC.

Section I. General Conditions (continued)

I. Fees (NAC 445B.315.3(i))
Permittee shall pay fees to the Bureau of Air Pollution Control in accordance with the provisions set forth in NAC 445B.327 and 445B.331.

J. Right to Entry (NAC 445B.315.3(j))
Permittee shall allow the Bureau of Air Pollution Control staff, upon the presentation of credentials, to:

1. Enter upon the premises of Permittee where:
   a. The stationary source is located;
   b. Activity related to emissions is conducted; or
   c. Records are kept pursuant to the conditions of this Operating Permit;
2. Have access to and copy, during normal business hours, any records that are kept pursuant to the conditions of this Operating Permit;
3. Inspect, at reasonable times, any facilities, practices, operations, or equipment, including any equipment for monitoring or controlling air pollution, that are regulated or required pursuant to this Operating Permit; and
4. Sample or monitor, at reasonable times, substances or parameters to determine compliance with the conditions of this Operating Permit or applicable requirements.

K. Certification (NAC 445B.315.3(k))
A responsible official of Permittee shall certify that, based on information and belief formed after reasonable inquiry, the statements made in any document required to be submitted by any condition of this Operating Permit are true, accurate and complete.

**************End of General Conditions***************

Issued to: TONOPAH SOLAR ENERGY, LLC.

Section II. General Monitoring and Recordkeeping Conditions

A. NAC 445B.315.2(h)
Permittee will submit yearly reports including, but not limited to, the status of the surface area disturbance. These reports will be submitted on the form provided by the Bureau of Air Pollution Control for the surface area disturbance specified on the form. The completed form must be submitted to the Bureau of Air Pollution Control no later than March 1 annually for the preceding calendar year.

**************End of General Monitoring and Recordkeeping Conditions***************

Issued to: TONOPAH SOLAR ENERGY, LLC.

Section III. Surface Area Disturbance Conditions

Surface area disturbance in excess of 20 acres – 2,680 acres for Crescent Dunes Solar Energy Project.

A. NAC 445B.22037
Fugitive Dust
1. No person may cause or permit the handling, transporting, or storing of any material in a manner which allows or may allow controllable particulate matter to become airborne.
2. Except as otherwise provided in subsection 4, no person may cause or permit the construction, repair, demolition, or use of unpaved or untreated areas without first putting into effect an ongoing program using the best practical methods to prevent particulate matter from becoming airborne. As used in this subsection, "best practical methods" includes, but is not limited to, paving, chemical stabilization, watering, phased construction, and revegetation.
3. Except as provided in subsection 4, no person may disturb or cover 5 acres or more of land or its topsoil until he has obtained an Operating Permit for surface area disturbance to clear, excavate, or level the land or to deposit any foreign material to fill or cover the land.
4. The provisions of subsections 2 and 3 do not apply to:
   a. Agricultural activities occurring on agricultural land; or
   b. Surface disturbances authorized by a permit issued pursuant to NRS 519A.180 which occur on land which is not less than 5 acres or more than 20 acres.

B. Dust Control Plan (NRS 445B.230.6)
Permittee may not cause or permit the construction, repair, or demolition work, or the use of unpaved or untreated areas without applying all such measures as may be required by the Director to prevent particulate matter from becoming airborne.

1. Permittee will control fugitive dust in accordance with the dust control plan entitled Fugitive Dust Control Plan, as submitted on December 15, 2010.

C. Posting (NAC 445B.308.7)
1. Permittee shall install a sign constructed and labeled with materials capable of withstanding the strong winds, intense sunlight, and other conditions characteristic of Nevada's outdoors. The sign must be erected along the major street bordering the property, or at the main entrance to the site, within 50 feet of the border of the property. The sign must be clearly legible from the road and not be obstructed by signs, vehicles, vegetation, or any materials. The sign shall be replaced or repaired should it become damaged or difficult to read.
2. A sign that meets the following criteria will generally meet the requirements of subsection 1:
   a. Grade A/C plywood ¾" thick, a minimum of 4 feet by 4 feet in dimension;
   b. Two 4"x 4" posts with the base of the sign a minimum of 2 feet above ground level;
   c. A minimum of two (2) carriage bolts for each post to secure the plywood sign to the posts.
3. The front of the sign must be labeled with dark lettering on a contrasting background. The sign shall clearly identify the name of the project, the name of the person (permittee, operator, or contractor) responsible for dust control, and provide the telephone number of the person responsible for dust control (valid during daylight hours, seven days a week), the project's street address (or physical location), and the air quality operating permit number. The sign must remain posted for the life of the permit. A sign labeled in block letters or numerals at least 4" high, in lines spaced 3" apart, in accordance with the following layout will generally meet the requirements of this section:

Project Name - acreage
Name of person responsible for dust control
In case of dust complaints, please call: (Your Number) **-OR-** **Nevada Division Of Environmental Protection: (775) 687-9349**
Project street address
BAPC Permit AP4911-2765

*************End of Surface Area Disturbance Conditions***************

Issued to: TONOPAH SOLAR ENERGY, LLC.

Section IV. Amendments

N/A

This permit:

1. **Is non-transferable. (NAC 445B.287.3)**
2. **Will be posted conspicuously at or near the stationary source. (NAC 445B.318.5)**
3. **Will expire and be subject to renewal five (5) years from:** February 22, 2011 **(NAC 445B.315)**
4. **A completed application for renewal of an operating permit must be submitted to the director on the form provided by him with the appropriate fee at least 70 calendar days before the expiration date of this operation permit. (NAC 445B.3473.2)**
5. **Any party aggrieved by the Department's decision to issue this permit may appeal to the State Environmental Commission (SEC) within ten days after the date of notice of the Department's action. (NRS 445B.340)**

THIS PERMIT EXPIRES ON: February 22, 2016

Signature

Issued by: Jeff Denison, P.E.
Supervisor, Permitting Branch
Bureau of Air Pollution Control

Phone: (775) 687-9336 Date: February 22, 2011

05/07
ajh
02/11

ndep
NEVADA DIVISION OF ENVIRONMENTAL PROTECTION
protecting the future for generations

STATE OF NEVADA
Department of Conservation & Natural Resources
DIVISION OF ENVIRONMENTAL PROTECTION

Brian Sandoval, Governor
Leo M. Drozdoff, P.E., Director
Colleen Cripps, Ph.D., Administrator

February 22, 2011

Tom Georgis
Vice President, Development
Tonopah Solar Energy, LLC.
2425 Olympic Blvd Suite 500 East
Santa Monica, California 90404

RE: Request New Surface Area Disturbance Air Quality Operating Permit AP4911-2765 FIN #A1205

Dear Mr. Georgis:

The application submitted by Tonopah Solar Energy, LLC for a new surface area disturbance permit for the Crescent Dunes Solar Energy Project, located in Nye County, has been reviewed by my staff under legal authority from Nevada Revised Statutes 445B.100 through 445B.640 and pursuant to Nevada Administrative Code 445B.001 through 445B.3689. Based on staff review and recommendation, I am hereby issuing Air Quality Operating Permit AP4911-2765, with appropriate restrictions. Please note that Operating Permit AP4911-2765 must be posted conspicuously at or near the source.

Nevada Administrative Code 445B.22037 requires fugitive dust to be controlled, and requires an ongoing program, using best practical methods, to prevent particulate matter from becoming airborne. Tonopah Solar Energy, LLC must implement all appropriate measures to limit controllable emissions from all construction activities which have the potential to adversely affect the local air quality. Appropriate measures for dust control may consist of a phased approach to acreage disturbance rather than disturbing the entire area all at once; using wet suppression through such application methods as water trucks or water spray systems to control wind blown dust; the application of soil binding agents or chemical surfactant to roadways and areas of disturbed soil; as well as the use of wind-break or wind-limiting fencing designed to limit wind erosion of soils.

Enclosed is your copy of Air Quality Operating Permit AP4911-2765. In accordance with Nevada Revised Statute 445B.340, you may appeal the department's action of issuance of this operating permit within 10 days after you receive the permit. Appeals may be filed with the State Environmental Commission, 901 South Stewart Street, Suite 4001, Carson City, Nevada, 89701-5249, telephone: (775) 687-9308.

If you have any questions, please feel free to contact Aaron Hoberg, at 775-687-9514.

Sincerely,

Jeff Denison, P.E.
Supervisor, Permitting Branch
Bureau of Air Pollution Control

JD/ajh
Enclosures: Permit AP4911-2765
Certified Mail No: 7010 0290 0001 6793 6959

SURFACE AREA DISTURBANCE PERMIT
FUGITIVE DUST CONTROL
AND
PROCESS EQUIPMENT EMISSION CONTROL PLAN
NEW STATIONARY SOURCE

I. COMPANY INFORMATION				
COMPANY NAME:	**TONOPAH SOLAR ENERGY, LLC.**			
BUSINESS ADDRESS:	**POLELINE ROAD**	**TONOPAH**	**NV**	**NYE**
	(STREET)	(CITY/TOWN)	(STATE)	(COUNTY)
MAILING ADDRESS:	**2425 OLYMPIC BLVD, SUITE 500 EAST**	**SANTA MONICA**	**CA**	**90404**
	(STREET/P.O BOX)	(CITY/TOWN)	(STATE)	(ZIP CODE)
PHONE NUMBER:	**(310) 315-2200**	**FAX NUMBER:**	**(310) 315-2201**	

II. RESPONSIBLE OFFICIAL (R.O.)				
R.O. NAME	**ROB HOWE**	**TITLE**	**PROJECT DIRECTOR**	
BUSINESS ADDRESS:	**POLELINE ROAD**	**TONOPAH**	**NV**	**NYE**
	(STREET)	(CITY/TOWN)	(STATE)	(COUNTY)
MAILING ADDRESS:	**2425 OLYMPIC BLVD, SUITE 500 EAST**	**SANTA MONICA**	**CA**	**90404**
	(STREET/P.O BOX)	(CITY/TOWN)	(STATE)	(ZIP CODE)
PHONE NUMBER:	**(310) 315-2270**	**FAX NUMBER:**	**(310) 315-2201**	

III. PHYSICAL PLANT						
FACILITY ADDRESS:			**TONOPAH**		**NV**	**NYE**
	(STREET)		(CITY/TOWN)		(STATE)	(COUNTY)
MAILING ADDRESS:	**2425 OLYMPIC BLVD, SUITE 500 EAST**		**SANTA MONICA**		**CA**	**90404**
	(STREET/P.O BOX)		(CITY/TOWN)		(STATE)	(ZIP CODE)
PHONE NUMBER:	**(310) 315-2270**		**FAX NUMBER:**		**(310) 315-2201**	
MAJOR X- STREETS:	**POLELINE ROAD (STATE HWY 89) & CRESCENT DUNES ROAD**					
SECTION:	**33, 34, 35**	**TOWNSHIP:**	**5N**	**RANGE:**	**41E**	
UTM:						
PROJECT MAPS: (MARK TYPE OF MAP ATTACHED)	☐	☐	☐	☒		
	(TRACT)	(SITE)	(TOPOGRAPHIC)	(OTHER - AERIAL)		

IV. ACKNOWLEGEMENT OF ENVIRONMENTAL CONTROL REQUIREMENTS BY R.O.

I, __ROB HOWE__, the Responsible Official for __TONOPAH SOLAR ENERGY, LLC__, have read and understand
(R.O. Name) (Company Name) the
provisions of Nevada Administrative Code (NAC) Section 445B.22037 "Emissions of Particulate Matter: Fugitive Dust" which requires that we prevent controllable fugitive dust to become airborne on a 7-day/24-hour /day basis at our facility's site.

Signed_____ Date_____
(R.O. Signature)

SURFACE AREA DISTURBANCE PERMIT
FUGITIVE DUST CONTROL
AND
PROCESS EQUIPMENT EMISSION CONTROL PLAN
NEW STATIONARY SOURCE

V. FACILITY OPERATIONS

Description of Facility Operations: THE SITE WILL BE PREPARED FOR THE CONSTRUCTION AND OPERATION OF A CONCENTRATED SOLAR-THERMAL POWER (CSP) PLANT. THE PLANT WILL BE OF A MOLTEN SALT CENTRAL RECEIVER TYPE WITH INHERENT MOLTEN SALT THERMAL ENERGY STORAGE. THE NOMINAL CAPACITY OF FACILITY WILL BE 110 MW. ACTIVITIES DURING THIS PHASE OF THE PROJECT INCLUDE OPERATION OF DIESEL FUEL MOBILE EQUIPMENT AND PORTAL DIESEL GENERATORS LESS THAN 500 HP FOR TEMPORARY POWER NEEDS.

VI. FUGITIVE DUST CONTROL - BEST PRACTICAL METHODS

Best Practical Methods for controlling fugitive dust (Facility Site): The best practical methods (BPMs) to be used for controlling fugitive dust generated at this facility's disturbed areas are as follows. . This is not an all inclusive list, other BPMs may also be appropriate for this section (check appropriate BPMs):

- ☒ Use of water trucks to spray water on disturbed areas on a regular basis
- ☒ Pre-watering of areas to be disturbed (including all unpaved onsite roads and staging areas)
- ☐ Graveling of roadways, storage areas and staging areas
- ☒ Posting and limiting vehicle speeds to 10-15 miles per hour
- ☐ Use of wind fences to reduce wind impacts
- ☒ Cessation of all operations when winds make fugitive dust control difficult
- ☒ Fencing or berming to prevent unauthorized access to disturbed areas.
- ☒ Application of water sprays on material storage piles on a regular basis
- ☒ Covering material storage piles with tarpaulin or geo-textiles; tenting
- ☐ Use of overhead water spray rack or water hoses to water down uncovered trucks transporting processed materials prior to leaving facility boundaries.
- ☒ Track-out controls
  - ☒ Graveled entrance and exit areas
  - ☐ Street Sweeping
  - ☐ Other
- ☒ Subcontractors: Any and all subcontractors (including truck drivers) informed of their responsibilities for the control of fugitive dust while they are on the facility site (including haul roads to and from the site). In addition, they will be advised of the best practical methods for controlling their fugitive dust as well as keeping off adjacent areas not covered by the facility's permit.
- ☒ Equipment Operator and/or Responsible Official has read and understands the requirements in the facility's Surface Area Disturbance Permit and Plan
- ☒ Other Applicable BPM: DUST PALLIATIVE TO BE APPLIED TO OPEN AREAS
- ☐ Other Applicable BPM: _____
- ☐ Other Applicable BPM: _____

VII. FUGITIVE EMISSIONS CONTROL - BEST PRACTICAL METHODS

Best Practical Methods for controlling fugitive emissions (Process Equipment): The best practical methods for

controlling fugitive emissions from process equipment used at this facility are as follows (check appropriate BPMs):

- ☒ Air Quality Operating Permit posted onsite in area easily accessible by employees (Permit requirement)
- ☒ Equipment Operator and/or Responsible Official has read and understands the requirements in the facility's Air Quality Operating Permit
- ☒ Proper use of emission control equipment as specified in the facility's Air Quality Operating Permit terms and conditions
- ☒ Daily pre-operational check of emission control equipment by Equipment Operator to assure proper operation of the emission control equipment (Attach copy of operator daily checklist to this plan). The daily checklist must be signed by equipment operator and kept with the operational log required in Section VIII)
- ☒ Visual emission training of equipment operator to recognize excess emissions and authority to shut down operations if excess emission occurs (If certified, attach a copy of the Equipment Operator's current VE certificate)
- ☐ Other Applicable BPM: _____
- ☐ Other Applicable BPM: _____
- ☐ Other Applicable BPM: _____

VIII. FACILITY FUGITIVE DUST/EMISSIONS RESOURCES INFORMATION

Water Trucks: Water trucks may be owned or rented. In the event that one or more water truck(s) necessary for control of fugitive dust (owned, rented or leased) becomes inoperable, additional water truck(s) will be rented or leased for until such time the water truck(s) are operable. Operable water truck (s) must be available on 7-day/week, 24-hour/day basis.

Number of Water Trucks: UP TO FIVE TRUCKS

Water Truck # 1	**TBD**	**Capacity Gallons:**	**4,000 GALLONS**
Water Truck # 2	**TBD**	**Capacity Gallons:**	**4,000 GALLONS**
Water Truck # 3	**TBD**	**Capacity Gallons:**	**4,000 GALLONS**
Water Truck # 4	**TBD**	**Capacity Gallons:**	**4,000 GALLONS**
Water Truck # 5	**TBD**	**Capacity Gallons:**	**4,000 GALLONS**

Location of water supply for control of fugitive dust: ONSITE GROUNDWATER WELLS

Water Truck and Construction Equipment Operational Log: the daily operations log book for recording the operation of the water truck and construction equipment is maintained on the facility site. The log contains the following information:

- Hours of operation for each water truck and construction equipment (front loader, scraper, etc.) used onsite.
- The daily quantity of water used for fugitive dust control purposes.
- Starting and ending times for the workday.
- Record of water truck (including rental water truck) and construction equipment maintenance, malfunctions and repairs.

Location of water supply for control of fugitive emissions: ONSITE GROUNDWATER WELLS

VIII. FACILITY FUGITIVE DUST/EMISSIONS RESOURCES INFORMATION (CONTINUED)

Process and Emission Control Equipment Operational Log: the daily operations log book for recording the operation of the permitted process equipment is maintained on the facility site. The log contains the following information and attachments:

- Hours of operation for each System shown on the Air Quality Operating Permit
- Starting and ending times for the workday
- Daily pre-operational check of emission control equipment checklists (signed and dated)
- Record of all emission control equipment malfunctions, repairs and servicing. Record down times and when equipment was returned to service.
- Record of process equipment malfunctions, servicing and down times and when equipment was returned to service

IX. NOTIFICATION

Excess Emissions: The following training requirements are recommended as an aid maintaining compliance with permit terms and conditions and are not mandatory. It is recommended that the R.O. and/or selected equipment operators be given USEPA Method 9 visual emission training (or equivalent, as determined by NDEP) to recognize when the facility's permit's opacity limits are being exceeded and procedures to follow to bring systems back into compliance. It is recommended that all training records be kept with the facility's Process and Emission Control Equipment Operational Log.

X. TRAINING

Training Requirements: The following training requirements are recommended as an aid in maintaining compliance with permit terms and conditions and are not mandatory. It is recommended that the R.O. and/or selected equipment operators be given USEPA Method 9 visual emission training (or equivalent, as determined by NDEP) to recognize when the facility's permit's opacity limits are being exceeded and procedures to follow to bring systems back into compliance. It is recommended that all training records be kept with the facility's Process and Emission Control Equipment Operational Log.

XI. PLAN REVISION

Plan Revision Requirements: In the event there are changes in the operation of the facility, modifications made to the facility's Air Quality Operating Permit or changes to the Nevada Administrative Code affecting this plan, the plan shall be revised to reflect those changes and modifications and resubmitted to the Nevada Division of Environmental Protection for review and evaluation.

Plan Date:	**JUNE 1, 2011**