State Of California The Resources Agency of California

Memorandum

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To: Commissioner Anthony Eggert, Presiding Member
Commissioner Jeffrey Byron, Associate Member

From: California Energy Commission – Christopher Meyer, Project Manager
1516 Ninth Street
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Subject: **ENERGY COMMISSION STAFF'S SECOND ERRATA TO THE SUPPLEMENTAL STAFF ASSESSMENT FOR THE CALICO SOLAR PROJECT (08-AFC-13)**

Energy Commission staff is providing a second Errata to the Supplemental Staff Assessment (SSA) to include changes developed out of the August 10, 2010 Committee-Ordered Staff Workshop and new information from either the applicant or agencies. This includes changes to the analysis and conditions of certification in the **Biological Resources** and **Worker Safety/Fire Protection** sections with changes presented in underline-strikeout form. In addition, changes have been made to the conditions of certification in the **Geology and Paleontological Resources** and **Soil and Water Resources** conditions of certification and appendices.

Docket (08-AFC-13)
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ERRATA TO JULY 21, 2010 SUPPLEMENTAL STAFF ASSESSMENT

BIOLOGICAL RESOURCES

C.2.1 SUMMARY OF CONCLUSIONS, PAGES C.2-3 TO C.2-4

Desert Tortoise: Implementation of the Calico Solar Project will result in adverse effects to desert tortoise (federally and State listed as a threatened species). Construction of the proposed project would result in the permanent loss of approximately 6215 acres of occupied desert tortoise habitat (4,075 acres of good quality habitat north of the Burlington Northern Santa Fe (BNSF) Railroad and 2,140 acres of less suitable habitat south of the BNSF tracks). In addition, the project area is expected to support an estimated 93 adult and sub-adult desert tortoises, between 41 to 96 juvenile tortoises and approximately 436 eggs. Staff concludes that the proposed project would result in direct mortality to all 436 eggs and 82 juvenile tortoises that may occur in the project area. Staff concludes that the Applicant will be required to translocate approximately 107 tortoises (93 adults and 14 juveniles). In total this will require the Applicant to handle, radio tag, and disease test 321 tortoises. ~~In addition, the applicant has indicated that approximately 57 desert tortoises would need to be translocated outside of the Calico Solar Project site.~~ Currently staff, CDFG, and USFWS are working with the applicant to develop a Desert Tortoise Translocation Plan for the project. The translocation of tortoises and other construction related impacts of the proposed project pose substantial effects to this species. To reduce these effects staff has proposed Conditions of Certification **BIO-1** through **BIO-9**, which apply to protection of desert tortoise and other biological resources in and near the Calico Solar Project area, and Conditions of Certification **BIO-15** through **BIO-17**, which are specific to desert tortoise. To reduce effects of the large scale land use conversion, staff, CDFG, and USFWS are requiring compensatory mitigation. This compensatory mitigation is designed to fully mitigate impacts as required under the California Endangered Species Act (CESA), and requires a full mitigation finding, which usually contemplates a mitigation ratio greater than 1:1 to compensate for loss of high-value habitat (i.e., acquisition or preservation of more than one acre of compensation lands for every acre lost). On past energy projects considered by the Energy Commission, the California Department of Fish and Game (CDFG) has required a 3:1 compensation ratio to meet the CESA full mitigation standard for good quality habitat such as that found on much of the Calico Solar Project site. The higher ratio reflects the limits to increases in carrying capacity that can be achieved on the acquired lands, even with implementation of all possible protection and enhancement measures. The BLM typically applies a 1:1 compensation requirement and pursues desert tortoise recovery goals through implementation of region-wide

management plans and land use planning as described in the West Mojave Plan (BLM et al. 2005; BLM 2006) and the Desert Tortoise Recovery Plan (USFWS 1994b).

Energy Commission staff proposes compensation at a 3:1 ratio for loss of desert tortoise habitat north of the BNSF Railroad, and at a 1:1 ratio for habitat south of the railroad, to achieve full mitigation under CESA and to mitigate under CEQA for habitat loss and other significant impacts to desert tortoises. These mitigation ratios include the 1:1 mitigation ratio proposed by the BLM for impacts to desert tortoise habitat as well as additional mitigation proposed by the Energy Commission staff for impacts to the species. Staff has proposed that impacts to the area south of the BNSF Railroad be mitigated at a 1:1 ratio, because this area supports lower-quality habitat for the desert tortoise, and is enclosed to the north and south by the BNFS Railroad and the I-40, respectively. These barriers to tortoise movement in this area reduce effective habitat value.

Based on these ratios, the total acreage of desert tortoise compensation land acquisition and protection would be 14,365 acres. BLM's requirement for mitigation at a 1:1 ratio, which will include funding for BLM to implement desert tortoise habitat enhancement projects on BLM land, will also serve to satisfy a portion of the Energy Commission's compensation lands requirement. However, even with credit for mitigation provided to BLM, no fewer than 8,150 acres of compensation land will be acquired, permanently protected and managed. Staff estimates total cost of acquisition, protection, and enhancement at ~~$49,223,057.50~~ $50,325,164.23.

C.2.1 SUMMARY OF CONCLUSIONS, PAGES C.2-71 TO C.2-84

Desert Tortoise

Desert tortoises are present within the proposed Calico Solar Project footprint and within the adjacent desert areas ~~both east and west of~~ surrounding the site. Protocol surveys conducted in 2010 detected 104 tortoises within the project footprint identified in the SA/DEIS (**Biological Resources Figure 3**). Using the formula recommended by the USFWS to calculate the total number of tortoises that are likely present but were not identified during the surveys (either because the tortoises were below ground, concealed by vegetation or topography or overlooked by the surveyor), the originally-proposed project footprint is expected to support approximately 176 adult and subadult tortoises. The USFWS's 2010 survey protocol takes into account the probability that tortoises would be present above ground based on the previous winter's rainfall and the fact that not all tortoises within the survey area are seen by surveyors, and provides a mathematical formula that is used to estimate the number of adult tortoises that are actually present.

The highest concentration of tortoises is in the Phase II area of the original footprint, located on the foothills and bajadas of the Cady Mountains. Burrow density was also

concentrated in this area; however, burrows were present to some degree in most of the project area. Interestingly, although habitat utilized by desert tortoises is present across most of the site, only eight tortoises were observed in the Phase I area. The high tortoise density in the foothills is likely linked to the microhabitats associated with the bajadas that provide increased foraging opportunities and soil structure for burrowing. Tortoise densities in the Phase II area are considered very high and well over the average tortoise density of (4.7 tortoise/km^2) identified by the West Mojave Plan (BLM et al. 2005). Because of concerns presented by staff and the wildlife agencies regarding the preservation of habitat near the toe of the Cady Mountains to provide a linkage and movement corridor for desert tortoise, the applicant modified the project footprint to provide approximately 4,000 feet between the project boundary and the base of the mountains as a movement corridor, as recommended by the USFWS Desert Tortoise Recovery Office (DTRO). This reduction would avoid some tortoises and would preserve movement areas and occupied habitat for tortoises. Nonetheless, the proposed project would result in the loss of high density tortoise habitat. Based on the new project footprint addressed in this SSA, 57 tortoises were identified during the 2010 surveys within the proposed project area.

The actual number of desert tortoises on the project site cannot be determined from field survey data alone, due to the likelihood that some tortoises may have been overlooked during surveys (e.g., they may have been in deep burrows where they could not be seen) and some may have been counted twice (e.g., a tortoise may have been counted on one transect line, then moved to an adjacent one where it may have been re-counted). The USFWS provides a mathematical formula for estimating actual numbers of adult and sub-adult desert tortoises from field survey data. Statistical techniques can provide further estimates of minimum and maximum numbers of tortoises expected, within a 95% confidence interval. In addition, most juvenile tortoises and tortoise eggs are not detected during field surveys.

All tortoises, including adults, subadults, and juveniles found on the site during clearance surveys would be translocated off the site to new locations. Because handling and translocation causes risk to tortoise survival, all translocated tortoises must be radio-tagged and monitored to evaluate translocation success. Tortoises already at the translocation sites (i.e., the “host” population) may experience increased mortality due to increased competition for resources (food, water, burrows). The USFWS will permit only limited numbers of tortoises to be relocated into any given area to avoid exceeding the carrying capacity of the site, and requires radio-tagging and follow up monitoring of an equal number of host population tortoises at each translocation site. In addition, USFWS requires radio-tagging and follow-up monitoring of an equal number of tortoises at a selected control site, where no translocated animals have been introduced. Due to these monitoring requirements, two additional tortoises must be handled and radio-tagged for each tortoise translocated.

In the following text, staff describes its estimates of the numbers of tortoises that would be translocated from the project site; numbers of tortoises that would be handled at translocation sites and control sites; and numbers of undetected juveniles and eggs that may suffer mortality on the project site. Using the formula recommended by the USFWS, an estimated 93 adult and sub-adult desert tortoises may occur on the project site. The USFWS formula also provides a confidence interval which indicates the reliability of the estimate (i.e., a wider confidence interval indicates that less certainty is associated with the estimate). The 95 percent confidence interval for this estimate ranges from a low of 47 to a high of 185 adult and subadult tortoises. Although 57 tortoises were observed during the surveys, these estimates account for potential errors both in overlooking tortoises and from the surveyors double counting tortoises that have moved into the adjacent transect line.

Biological Resources Table 6a (Desert Tortoise Density Estimates and Impact Summary) provides information on the number of tortoises that could be subject to project disturbance at the proposed project site and translocation areas.

In addition to the 93 adult and subadult tortoises estimated to occur on the site using the USFWS formula, the proposed project site is expected to support numerous juvenile tortoises that are often overlooked during biological surveys. Juvenile tortoises are extremely difficult to detect because of their small size and their cryptic nature and are not considered in the formula described by the USFWS. However, estimates of juvenile tortoise populations can be extrapolated using information provided based on a four-year study of tortoise population ecology conducted by Turner et al. (1987). This study determined that juveniles accounted for approximately 31.1 to 51.1 percent of the overall tortoise population. Using this range and the estimate of 93 adult tortoises, the project site may support between 41 to 96 juvenile tortoises (i.e., a total population of 134 to 189 adults, subadults, and juveniles).

The number of tortoise eggs that could be present on the proposed project site was estimated based on the assumption of a 1:1 sex ratio (i.e., 47 out of the 93 adult desert tortoises onsite could be reproductive females) and that all females present would lay eggs (clutch) in a given year. Using the average clutches per reproductive female in a given year (i.e., 1.6, see Turner et al. 1984), multiplied by the average number of eggs found in a clutch (i.e., 5.8; see Service 1994); approximately 436 eggs would be expected on the site in a given year. However, fewer eggs are likely to be onsite at any given time because it is likely that not all females are of reproduction age.

Although not within the project footprint the BLM of tortoise density for the 960 acre NAP Area A (Figure 2) are 24 total tortoises (including adults, subadults, and juveniles) (BLM 2010a). because these areas were not surveyed they do not include the range of tortoises densities provided by the USFWS formula. Using the 31.1-51.1 percent ratios of total population described by Turner et al (1987) this would include between 11-15 juveniles. Tortoises are also expected to occur in the adjacent lands surrounding the

project site. BLM estimates for these areas include up to 37 adult and subadult tortoises. Approximately 17-39 juvenile tortoises could occur in these areas. These tortoises would not be exposed to direct effects. A description of indirect effects is described below.

In summary the project site is expected to support an estimated 93 adult and sub-adult desert tortoises, between 41 to 96 juvenile tortoises, and approximately 436 eggs. Based on the rain year and weather conditions during the survey season staff considers these estimates to be a reasonable assumption for the purposes of this analysis.

Biological Resources Table 6a
Desert Tortoise Density Estimates and Impact Summary

	Estimated Number of Tortoises			
Project Feature	Adult/Sub-adult* (Min-Max)	Juveniles** (Min-Max)	Eggs***	Total Adult/Sub-adult and Juvenile
Direct Effects				
Project site[1]	93 (47-185)	96 (41-96)	436	189 (88-281)
Translocation Area[2]	93 (47-185)	96 (41-96)	N/A	189 (88-281)
Control Area[3]	93 (47-185)	96 (41-96)	N/A	189 (88-281)
Subtotal	**279 (141-555)**	**288 (123-288)**	**N/A**	**567 (264-843)**
Indirect Effects				
Buffer Area	37	39 (17-39)	N/A	76 (17-39)
NAP Area A	24	15 (11-15)	N/A	39 (11-15)
Subtotal	**61**	**54 (28-54)**	**N/A**	**54 (28-54)**
Total Direct and Indirect	**340 (141-555)**	**342 (151-342)**	**436**	**682 (292-897)**

*Assumes based on USFWS formula. The 95 percent confidence interval for this estimate ranges from a low of 47 tortoises to a high of 185 adult individuals.
** Table assumes high end of juveniles present. Assumes that juvenile tortoise account for 31.1 to 51.1 percent of the overall tortoise population.
*** Assumes a 1:1 sex ratio (i.e., 47 out of the 93 adult desert tortoises are reproductive females) and that all females present would clutch in a given year. Assumes average clutches per reproductive female in a given year (i.e., 1.6, see Turner et al. 1984), multiplied by the average number of eggs found in a clutch (i.e., 5.8; see Service 1994).
1. Includes 6,215 acres project site.
2. Assumes one tortoise will be handled at the translocation site for each tortoise subject to the translocation effort.
3. Assumes one tortoise will be handled at the control site for each tortoise subject to the translocation effort.

4. Assumes a 1,000 foot buffer and a tortoise density of 16 tortoises per square mile.
5. Assumes the 960 acre NAP Area A supports up to 24 tortoises.

Implementation of the proposed project would result in the direct loss of approximately 6,215 acres of occupied desert tortoise habitat: 4,074.7 acres occur north of the BNSF railroad and 2,139.9 are located south of the BNSF railroad. In addition, portions of excluded private lands identified as Not A Part [NAP] areas, see **Biological Resources Figure 1**) would be surrounded on three sides by the Calico Solar facility fencing. One of these areas is located in an area with low tortoise density adjacent to I-40, but the other is in an area of higher value habitat and tortoise density, north of the BNSF railroad tracks.

Habitat north of the railroad constitutes good quality habitat and supports high densities of desert tortoise in some areas. This area is characterized by creosote bush scrub and has less obstructed connectivity to adjacent natural lands. Although habitat for desert tortoise is present in the area between the BNSF railroad and I-40, staff concurs with the applicant that the area between the BNSF railroad and I-40 provides lower quality habitat for tortoises. This area is isolated by the highway and railroad, has been subject to disturbance from pipeline development, and provides little long-term value to the species. Nonetheless, tortoise sign was detected in this area by staff and the applicant. In addition, while the railroad poses a substantial barrier to movement, there are numerous corridors for dispersal beneath the many railroad trestles that span drainages.

A site visit conducted by BLM and members of the USFWS DTRO on June 17, 2010 concluded that because of the low tortoise density of the area any remaining tortoises within the excluded property would be able to persist, and that connectivity to adjacent lands is present (via a culvert under Interstate-40). Staff considered these areas for inclusion in the total mitigation requirements however, based on an inspection of the project site these areas were determined to either provide adequate connectivity to occupied lands (NAP area to the north) or provide limited habitat value and have such low tortoise density (NAP area to the south) that mitigation for these areas was not warranted. Two tortoises found in a small exclusion area east of the southern NAP area would be left in place provided the culvert under Interstate-40 can be fenced to prevent tortoises from entering the highway. If the culvert cannot be fenced due to restrictions associated with highway maintenance, the two tortoises would be translocated off the site (see Conditions of Certification **BIO-15** and **BIO-16**).

Impacts to Critical Habitat

There is no federally designated critical habitat for desert tortoise within the proposed development footprint and no direct or indirect impacts to critical habitat would result from the project. The nearest critical habitat is in the Ord-Rodman Mountains Unit, directly south and upslope of the western end of the project site, across Interstate-40 (USFWS 1994b). Potential impacts to the Ord-Rodman Mountains Unit are not

expected to occur from the proposed translocation of desert tortoise into this area. Although some vehicle access would occur the majority of access would be from existing roads and proposed conditions of certification would reduce potential impacts to desert tortoise. Additional information describing potential translocation impacts to designated critical habitat are described below.

Direct Impacts

During construction of the Calico Solar project desert tortoises could be harmed during clearing, grading, and trenching activities or may become entrapped within open trenches and pipes. Construction activities could also result in direct mortality, injury, or harassment of individuals and eggs as a result of encounters with vehicles or heavy equipment. Other direct effects could include individual tortoises or eggs being crushed or entombed in their burrows, collection or vandalism, disruption of tortoise behavior during construction or operation of facilities, disturbance by noise or vibrations from the heavy equipment and the SunCatcher engines, and injury or mortality from encounters with workers' or visitors' pets. Desert tortoises may also be attracted to the construction area by the application of water to control dust, placing them at higher risk of injury or mortality. Increased human activity and vehicle travel would occur from the construction and improvement of access roads, which could disturb, injure, or kill individual tortoises. Also, tortoises may take shelter under parked vehicles and be killed, injured, or harassed when the vehicle is moved. The applicant has recommended impact avoidance and minimization measures to reduce these direct impacts to desert tortoise, including installation of exclusion fencing to keep desert tortoises out of construction areas, translocating the resident desert tortoises from the Calico Solar site, reducing construction traffic and speed limits to reduce the incidence of vehicles strikes and worker training programs. Staff has incorporated these recommendations into conditions of certification. These include Conditions of Certification **BIO-1** through **BIO-9**, which apply to protection of desert tortoise and other biological resources in and near the Calico Solar Project area, and Conditions of Certification **BIO-15** through **BIO-17**, which are specific to desert tortoise.

Staff's proposed Condition of Certification **BIO-15** (Desert Tortoise Clearance Surveys and Exclusion Fencing) would require installation of security and desert tortoise exclusionary fencing around the entire project site and along access roads, and **BIO-16** (Desert Tortoise Translocation Plan) would require that the applicant prepare and implement a desert tortoise translocation plan to move the tortoises currently living in the Calico Solar project area to proposed translocation sites. The applicant has identified several potential translocation sites. The USFWS prefers to use the term less than 500 m translocation and greater than 500 m (meter) translocation. The Applicant proposed less than 500 m translocation sites include the linkage area north of the project boundary and the Pisgah ACEC located east of the project site. However, new estimates of tortoise density in the linkage area may preclude the use of this site for translocation. The greater than 500 m translocation sites consist of approximately 9,833 acres and are located in the Ord-Rodman Mountains DWMA. The first site is located

south and west of the project while the second site is located south of the project along the existing SCE transmission line corridor. Additional translocation sites remain under evaluation and are discussed further below. ~~including areas north, east, and west of the project site.~~ Less than 500 m translocation sites ~~Some of these sites~~ are areas by definition less than 500 meters from the project boundary which would limit the need for disease testing and may allow some tortoises to maintain a portion of their home ranges after translocation. Additional information on the status of the Translocation Plan and potential receptor sites is described below.

Section 6 of staff's proposed **BIO-9** (Compliance Verification) requires written verification that all desert tortoise impact avoidance, minimization, and compensation measures have been implemented. In addition, **BIO-9** would require written documentation any project-related impacts, including incidental take, to listed species; an assessment of the effectiveness of conditions of certification in minimizing and compensating for project impacts with recommendations for future mitigation measures; and any other pertinent information. Staff's proposed **BIO-8** (Impact Avoidance and Minimization Measures) recommends a variety of additional impact avoidance and minimization measures to reduce the risk of injury and death to desert tortoise as well as other sensitive species. For example, these measures include minimization of construction, road, and traffic impacts; avoidance of vehicle impacts and wildlife entrapment; and monitoring of construction activities.

Because of the large scale land use conversion of the site coupled with the expected level of vehicle traffic and maintenance activities (i.e., mowing, mirror washing, etc.) required at the site, construction of the Calico Solar Project will require the applicant to translocate all the tortoises that occur within the proposed project footprint. The translocation of desert tortoise would occur prior to construction and would reduce the potential for construction and operation related mortality. However, even with the implementation of the Desert Tortoise Translocation Plan it is likely that some juvenile tortoises and eggs would be overlooked and subject to mortality from project activities within the enclosed fence line both during construction and post development. While this would be minimized through ~~However,~~ the implementation of staff's proposed Conditions of Certification **BIO-8** (Impact Avoidance and Minimization Measures)**, BIO-15 (**Desert Tortoise Clearance Surveys ~~A~~and Exclusion Fencing), and **BIO-16** (Desert Tortoise Translocation Plan) some onsite mortality would likely occur because of the cryptic nature of juvenile tortoises and from recent hatchlings not detected during the pre-construction clearance surveys. It is likely that desert tortoise will continue to be found within the project fence line during the multi-year development of the project. In addition, Conditions of Certification **BIO-15 (**Desert Tortoise Clearance Surveys and Exclusion Fencing) and **BIO-16** (Desert Tortoise Translocation Plan) have inherent risks and could themselves result in direct and indirect effects to tortoises on the proposed project site, translocation site, and control area. These could include direct effects such as mortality, injury, or harassment of desert tortoises due to equipment operation, fence installation activities, removal of tortoise burrows, and tortoise translocation. Indirect

effects could include but are not limited to intraspecific competition and the spread of disease. These impacts are described in more detail below.

Translocation

Construction of the proposed project would require the translocation of tortoises from the project site. This will require a series of actions including but not limited to the following activities:

- The identification of the proposed translocation and control sites;
- The evaluation of the habitat quality on the translocation and control sites;
- A determination of existing tortoise density and an assessment of the sites ability to accommodate additional tortoises above baseline conditions;
- Pre-construction fencing and clearance surveys of the project site;
- The construction of holding pens for quarantined translocated tortoises prior to their release into host populations;
- Pre-construction surveys of the proposed translocation sites;
- The placement of tracking units (GPS) on tortoises from the project site, translocation site, and control site;
- Disease testing for long distance translocated tortoises, host, and control sites;
- Long term monitoring and reporting of control and translocated and host populations, and;
- The implementation of remedial actions should excessive predation or mortality be observed.

Capturing, handling, and relocating desert tortoises from the proposed site after the installation of exclusion fencing could result in harassment and possibly death or injury. Impacts of translocation upon desert tortoises may include elevated stress hormone levels, changes in behavior and social structure dynamics, genetic mixing, increased movement (caused by antagonistic behavior with other tortoises, avoidance of predators or anthropogenic influence, homing, or seeking out of preferred habitat), spread of disease, and increased predation. Furthermore, handling, holding, and transport

protocols may compound with abiotic factors to affect the outcome for translocated individuals (Bertolero et al. 2007; Field et al. 2007; Rittenhouse et al. 2007; Teixeira et al. 2007), particularly during extreme temperatures, or if they void their bladders. Averill-Murray (2001) determined that tortoises that voided their bladders during handling had significantly lower overall survival rates (0.81-0.88) than those that did not void (0.96). If multiple desert tortoises are handled by biologists without the use of appropriate protective measures, pathogens may be spread among the tortoises, both resident and translocated animals. For those tortoises near but not within the Calico Solar site, removal of habitat within a tortoise's home range or segregating individuals from their home range with a fence would likely result in displacement stress that could result in loss of health, exposure, increased risk of predation, increased intraspecific competition, and death. Tortoises moved outside of their home ranges may attempt to return to the area from which they were moved, therefore making it difficult to isolate them from the potential adverse effects associated with project construction. Mortality of translocated desert tortoises has been estimated at approximately 15% (Sullivan 2008), though recent evidence from the desert tortoise translocation effort conducted in support of the Fort Irwin Land Expansion Project indicates that mortality rates may be closer to 25% per year (Gowan and Berry 2010).

Success rates of herpetofauna translocations range from 14% to 42%, suggesting that improved efforts are essential for the future recovery of many reptiles and amphibians (Dodd and Seigel 1991; Germano and Bishop 2009). A recent review of 91 herpetofauna translocation projects reported the primary causes of translocation failure were homing response by translocated individuals and poor habitat in translocated areas, followed by human collection, predation, food and nutrient limitation, and disease (Germano and Bishop 2009). The risks and uncertainties of translocation to desert tortoises are well recognized in the desert tortoise scientific community. The DTRO Science Advisory Committee (SAC) has made the following observation regarding desert tortoise translocations (DTRO 2009, p. 2):

> *As such, consensus (if not unanimity) exists among the SAC and other meeting participants that translocation is fraught with long-term uncertainties, notwithstanding recent research showing short-term successes, and should not be considered lightly as a management option. When considered, translocation should be part of a strategic population augmentation program, targeted toward depleted Populations in areas containing "good" habitat. The SAC recognizes that quantitative measures of habitat quality relative to desert tortoise demographics or population status currently do not exist, and a specific measure of "depleted" (e.g., ratio of dead to live tortoises in surveys of the potential translocation area) was not identified. Augmentations may also be useful to increase less depleted populations if the goal is to obtain a better demographic structure for long-term population persistence. Therefore, any translocations should be accompanied by specific monitoring or research to study the effectiveness or success of the translocation relative to changes in land use, management, or environmental condition.*

To provide guidance for the applicant in addressing these concerns and developing an adequate relocation/translocation plan, on January 27, 2010, the USFWS prepared specific draft guidelines for clearance and translocation of desert tortoises from the project sites. This included the Translocation of Desert Tortoises (Mojave Population) From Project Sites: Plan Development Guidance (USFWS 2010). This document provided guidance including the timing of relocation/translocation, disease testing requirements, and other actions to minimize impacts to desert tortoise. Current USFWS standards require disease testing and quarantine for any tortoise translocated more than 500 meters (985 feet). This requirement is intended to limit the potential exposure risk to healthy tortoises in adjacent habitat.

To date ~~the applicant has not finalized~~ the Draft Desert Tortoise Translocation Plan is being reviewed by the ~~.~~ Agencies. As of ~~June~~ August 2010 the USFWS, BLM, CDFG, and staff are ~~still~~ reviewing the information provided by the applicant and are ~~working to identify~~ providing guidance regarding ~~adequate~~ the adequacy of the translocation sites, the number of tortoises that can be translocated into these areas, and refining translocation procedures. Currently, the Draft Desert Tortoise Translocation Plan has proposed two less than 500 m and two greater than 500 m translocation sites. The Plan has also identified the proposed control area which will be used to monitor the success of the translocation sites.

The control area that has been identified for tortoise monitoring as part of the Desert Tortoise Translocation Plan is approximately 6,929 acres in size and is located to the northwest of the project site and to the south of I-15. A portion of the control area extends into the western portion of the Cady Mountains Wildlife Study Area. No desert tortoises would be relocated to the control area. However tortoises within the control area would be monitored to provide information regarding tortoise populations in an unaffected area for comparison to information obtained at the translocation sites. The tortoise monitoring would entail finding tortoises within the control area, attaching radio transmitters to them, and tracking them over a period of time.

The Applicant proposed less than 500 m translocation sites include the linkage area north of the project boundary and the Pisgah ACEC located east of the project site. However, preliminary estimates of tortoise density provided by the USFWS for the linkage area indicate that it currently supports approximately eight (8) tortoises per km². Because the linkage area will be confined to some degree by the project's northern desert tortoise exclusion fence, it will likely be precluded for use as a translocation site. Tortoise density in the Pisgah ACEC is approximately 6.1 tortoises per km². Based on preliminary estimates this would allow a maximum of two tortoises to be translocated into the Pisgah ACEC without compromising the carrying capacity of the area. In a broad sense the carrying capacity of an area is the maximum number of animals or population size that an area can support based on the existing conditions at the site. The Pisgah ACEC and the proposed linkage area north of the project site are considered at or near their carry capacity; thus all other tortoises detected on the project site would require long distance translocation.

The greater than 500 m translocation sites consist of approximately 9,833 acres and are located in the Ord-Rodman Mountains DWMA. The first site is located south and west of the project while the second site is located south of the project along the existing SCE transmission line corridor. Population estimates of the long distance translocation sites based on the 2007 range wide estimates provided by the USFWS suggest tortoise density in these areas is 8.2 per km². Although this density is high, information provided by the USFWS suggest that approximately 90 tortoises could be translocated to the Ord-Rodman Mountains DWMA. However, this estimate may be revised based on the results of the fall 2010 surveys.

Based on the estimated number of tortoises occurring on the proposed project site (93 adult and sub-adult tortoises plus approximately 96 juveniles) and the fact that the proposed translocation sites can support a maximum of 92 tortoises; the translocation lands would not be of sufficient size to accommodate the expected number of tortoises that would require translocation. However, most juvenile tortoises would not be detected during clearance surveys and would not be translocated. In addition, should the actual number of adult and subadult tortoises detected be closer to the lower confidence levels estimate identified in the USFWS formula (47-185) the proposed translocation sites may be adequate. Nonetheless for the purposes of this analysis staff must consider the potential for additional tortoises to be detected and considers it likely that the additional translocation sites will be required. The identification of these sites would be required prior to the commencement of translocation activities.

An important consideration in assessing potential impacts from the translocation effort is that for every tortoise that is moved to a long distance translocation site, two other tortoises must be handled, disease tested, and radio tagged. Thus, a total of three tortoises are handled for each translocation, including one tortoise from the project site; one tortoise from the host population at the proposed recipient site; and one tortoise at the control site. Tortoises at the recipient site and control site are diseased tested and radio tagged in order to ensure that healthy animals are not being introduced into a diseased population and to track the animals post-release. In addition disease testing and radio tagging allows the agencies to track the mortality of translocated versus host or control populations; provides long term monitoring of the populations; and provides a mechanism for evaluating whether mortality occurs uniformly across the control and recipient populations or is a result of the translocation event.

As identified in **Biological Resources Table 6a** (**Desert Tortoise Density Estimates and Impact Summary** a total of approximately 93 adult tortoises and up to 96 juvenile tortoises (41-96 based on 31.1-51.1 percent of total population) are expected to occur on the proposed project site. In addition 436 eggs may be present in the project footprint. Given the likelihood that all of the eggs will be lost and assuming approximately 85 percent of the juveniles will be overlooked, staff concludes that 35-82 juvenile tortoises (i.e., 85% of 41-96) and 436 eggs would be lost. Staff estimates that 15% of juvenile tortoises on the site (14 animals) would be located during clearance surveys and would be translocated off-site.

Therefore the total number of tortoises that require translocation would be 107 tortoises (93 adults and subadults, and 14 juveniles). This projects to an estimated 321 tortoises (93 adults + 14 juveniles*3) that would require handling, radio tagging, and long term monitoring. Staff notes that some juveniles may be too small to radio-tag, and that the final number may be somewhat lower; however, staff has provided this number for the purposes of identifying the number of tortoises that may be subject to translocation effects.

As described above, there are inherent risks to any action that requires the handling, disease testing, and translocation of desert tortoise. For the proposed project these risks will occur in the translocated population, the host population and in the control population. Although tortoises will not be translocated into the control population some mortality may occur from handling or from the placement of GPS tracking devices. For example, mortality at control populations is expected to be approximately five percent based on a review of scientific studies of tortoise mortalities associated with routine handling (Personal communication with CDFG Biologist Tonya Moore). Translocation mortality rates utilized for this assessment are assumed to be 50 percent based on information provided by the CDFG (Personal communication with CDFG Biologist Tonya Moore). Staff considers the information provided by CDFG to be relevant in the consideration of potential impacts to desert tortoise for the purposes of compliance with the California Endangered Species Act; however based on a review of translocation literature staff expects the translocation mortality to be lower than 50 percent.

Using the estimated mortality figure of five percent for the control population (107 adult and juvenile tortoises *0.05=5.35 rounded to 5) and an estimate of 50 percent mortality for the translocated and host populations (214 adults and juveniles * 0.50= 107) this would result in the potential loss of 112 tortoises from translocation mortality. Adding the additional estimated loss of 436 eggs and 82 juveniles not detected during the clearance surveys the proposed project could result in the mortality of 194 tortoises and 436 eggs.

It is important to note that the assumptions of translocation mortality are higher than those proposed by the USFWS. For example, the Chevron Lucerne Solar Project the Biological Opinion utilized a 30 percent translocation mortality (USFWS 2010c). In addition, while staff reviewed the Fort Irwin translocation mortality figures and the information provided by CURE; a recent abstract (http://www.int-res.com/prepress/n00298.html) of a retrospective study of tortoise predation rates reviewed by staff suggests that some of the high tortoise translocation mortality rates suffered at Fort Irwin occurred on a range wide basis and may not have been the direct result of the translocation effort alone. Mortality of desert tortoise was likely compounded by regional drought and excessive coyote predation. While it would be expected that translocated animals would have suffered mortality to some degree even in the best of years, the high mortality rates identified in the Fort Irwin translocation study may be higher than could be expected for the proposed project.

To supplement the estimates described above, staff provides further estimates of potential numbers of tortoises on the site using the high end of the USFWS confidence level for the proposed project site. At the 95% confidence interval, as many as 185 adult and subadult tortoises and between 83 and 193 juvenile tortoises may occur on the project site. Based on these numbers of adults and subadults, approximately 863 eggs may also occur on the site (calculated by the method described above). Using the formulas described above the total number of tortoises that would require translocation would be 214 tortoises (185 adults and 29 juveniles (0.15*193 juveniles)).

This translates to an estimated 642 tortoises (185 adults + 29 juveniles*3) that would require handling, radio tagging, and long term monitoring. Using the estimated mortality figure of five percent for the control population (214 adult and juvenile tortoises *0.05=10.7 rounded to 11) and an estimate of 50 percent mortality for the translocated population (214 adults and juveniles * 0.50= 107) this would result in the potential loss of 118 tortoises from translocation mortality. Adding the potential loss of 863 eggs and up to 164 juveniles not detected during the clearance surveys the proposed project could result in the mortality of up to 282 tortoises and 863 eggs.

~~Potential translocation sites have been surveyed for desert tortoises. Some sites already support high desert tortoise densities, which limit the number of tortoises that can be introduced into them. Staff, USFWS, BLM, and CDFG are still evaluating the number of tortoises that may be translocated to the linkage area north of the site.~~ Staff's proposed Condition of Certification **BIO-16** requires development of a final Desert Tortoise Translocation Plan in consultation with staff, CDFG, BLM, and USFWS to address outstanding concerns that these agencies have regarding the specifics of the plan. The plan, while still under development, would be reviewed by BLM, CDFG, USFWS, and Energy Commission staff, and approved pursuant to **BIO-16**, and would be implemented for the tortoises detected during clearance surveys. The Desert Tortoise Translocation Plan includes the identification and prioritization of potentially suitable locations for translocation; desert tortoise handling and transport considerations (including temperature); animal health considerations; a description of translocation scheduling, site preparation, and management; and specification of monitoring and reporting activities for evaluating success of translocation. With implementation of staff's proposed Condition of Certification **BIO-16**, adverse impacts associated with desert tortoise translocation would be minimized.

Habitat Loss and Compensatory Mitigation

Construction of the proposed Calico Solar facility would result in the direct and permanent loss of 6,215 acres of occupied desert tortoise habitat (TS 2010d). Compensatory mitigation is required to offset this significant impact and to fully mitigate for impacts to desert tortoise. Compensatory mitigation for desert tortoise typically involves balancing the acreage of habitat loss with acquisition of lands that would be permanently protected and enhanced to support healthy populations of desert tortoise. The compensation comes about by improving the carrying capacity of the acquired property

so that more desert tortoises will survive and reproduce on these lands, thus offsetting over time the decrease in numbers of tortoises resulting from the habitat loss.

For the acquisition of mitigation lands to truly compensate for the habitat loss and to make up for the numbers of desert tortoise that would otherwise have been supported by that habitat, the acquisition must be accompanied by: (1) permanent protection and management of the lands for desert tortoise, and (2) enhancement actions. The permanent protection is essential because it would allow the lands to be managed in a way that excludes multiple threats and incompatible uses (grazing, off-highway vehicle use, roads and trails, utility corridors, military operations, construction, mining, grazing by livestock and burros, invasive species, fire, and environmental contaminants). Without this protection and management the desert tortoise populations on the acquired lands would be subject to the same threats that led to its population declines and threatened status. While the BLM cannot guarantee the exclusion of these types of activities from acquired lands due to their multiple-use mandate, the Energy Commission concludes that this level of protection would be necessary to meet the mitigation requirements for loss of desert tortoise habitat under CEQA and CESA. An equally important component is the implementation of enhancement actions to improve desert tortoise survival and reproduction. These actions might include habitat restoration, invasive plant control, road closures or road fencing, reducing livestock and burro grazing, and controlling ravens and other predators. Without permanent protection and enhancement actions on lands acquired for mitigation, the project's impacts would result in a net loss of desert tortoises and their habitat.

To fully mitigate the loss of desert tortoise habitat under CESA,CDFG usually requires a mitigation ratio greater than 1:1 for compensation lands (i.e., acquisition of more than one acre of compensation lands for every acre lost), and typically uses a 3:1 ratio or higher for good quality habitat such as that found in portions (i.e., north of the BNSF Railroad) of the Calico Solar Project site. The higher ratio reflects the limits to increases in carrying capacity that can be achieved on the acquired lands, even with implementation of all possible protection and enhancement measures. Depending on the quality of habitat that is lost and the habitat conditions of the land that is acquired, it is difficult to sufficiently increase the carrying capacity of the acquisition lands to completely offset habitat loss without relying on additional acreage to boost the numbers of desert tortoise that can be supported on the mitigation lands. The BLM applies a 1:1 compensation ratio and also pursues desert tortoise recovery goals through implementation of region-wide management plans and land use planning as described in the WEMO, the California Desert Conservation Act plan, and the Desert Tortoise Recovery Plan (USFWS 1994).

The applicant has proposed a 1:1 ratio to mitigate for permanent impacts to desert tortoise habitat. In consultation with USFWS and CDFG, staff has concluded that a mixed habitat compensation ratio of land acquisitions based on the final construction footprint would mitigate for desert tortoise habitat loss within the Project Disturbance Area. The rationale for the mixed ratio is that tortoise habitat, use of the site, and long term habitat value for tortoise varies within the project footprint.

The highest tortoise densities were observed in the northern portions of the project site where more complex topography provides for better foraging and soils for burrowing than found on the southern portions of the site. The northern areas abut other occupied lands and, while subject to some level of historic disturbance from mining, are more isolated from human activity and provide improved connectivity to other areas of occupied habitat, due in part to their distance from Interstate-40 and the BNSF railroad tracks. Staff proposed mitigation for habitat loss on the portion of the project site north of the BNSF railroad tracks (4,075 acres) at a 3:1 ratio. This mitigation ratio is consistent with past Energy Commission mitigation requirements for projects with impacts to desert tortoise (for example, High Desert Power Plant Project and the Victorville 2 Hybrid Power Project), as well as staff's recommended mitigation as stated in the Final Staff Assessment for the Beacon Solar Energy Project and the Ivanpah Solar Energy Generating Station, and with Incidental Take Permits issued by CDFG for other non-Energy Commission jurisdiction projects in the region.

Conversely, only two tortoises and a scattered assemblage of burrows were observed in the area between the BNSF railroad and Interstate-40. This area has been subject to repeated anthropogenic disturbance, including construction of the BNSF Railroad, Interstate-40, and pipeline and utilities. The railroad and interstate highway have also modified the hydrology of this area to some degree by intersecting a series of desert washes that flow from the Cady Mountains (SES 2009l), though culverts and railroad trestles continue to convey flow and sediment south of the BNSF Railroad. Because the southern portion of the project site between the railroad and highway (2,140 acres) has been subject to previous and ongoing human disturbance, and provides poor biological connectivity with occupied habitat to the north, staff recommends a 1:1 ratio for this area.

State and Federal Desert Tortoise Mitigation Requirements

To satisfy BLM requirements a 1:1 compensation ratio has been applied for the entire 6,215 acre site. This includes lands both north and south of the BNSF railroad. This has been deemed adequate to mitigate for tortoise because the BLM pursues desert tortoise recovery goals not through parcel by parcel acquisitions and management, but rather through implementation of region-wide management plans and land use planning as described in the WEMO, the California Desert Conservation Act plan, and the Desert Tortoise Recovery Plan (USFWS 1994).

To satisfy CDFG's full mitigation standard and to comply with requirements of a State Incidental Take Permit for desert tortoise, the proposed mitigation must meet certain criteria described in Title 14 CCR, Sections 783.4(a) and (b). These criteria include requirements that the proposed mitigation would be capable of successful implementation and that adequate funding is provided to implement the required mitigation measures and to monitor compliance effectiveness of the measures. As described above, the CDFG has recommended the following mitigation strategies that fulfill the state's full mitigation standard for desert tortoise. CDFG requires a 1:1 ratio for the area between the BNSF Railroad and I 40. This mitigation requirement would be

achieved through the application of the standard BLM 1:1 ratio and mitigation strategy (i.e., payment of fees) described below. For all other areas a 3:1 ratio is required. This ratio would include both the 1:1 ratio (fee payment) required by the BLM and the 2:1 ratio required by the CDFG and USFWS for habitat acquisition and management.

As specified in staff's proposed Condition of Certification **BIO-17**, acquisition, protection and enhancement of desert tortoise habitat, in combination with the requirements of **BIO-15** and **BIO-16**, would mitigate project impacts to desert tortoise. Acquisition of appropriate mitigation lands as described in **BIO-17** would secure lands that would promote protection of high quality desert tortoise habitat and facilitate biological connectivity in the region.

Staff's proposed Condition of Certification **BIO-17**, Desert Tortoise Compensatory Mitigation, specifies security for acquisition of 14,365 acres and provides an estimate of associated costs. These costs include an acquisition fee of $1,000 per acre, initial habitat improvement costs at $250 per acre, long-term management fund is estimated at $1,450 per acre, and other administrative and acquisition costs (see **Biological Resources Table 7**). The estimated composite mitigation cost to meet staff's recommendation for establishing the security would be $3,501~~4~~3 per acre. This security amount may change with updated appraisals and when a Property Analysis Record is prepared for the parcels selected for acquisition. It is important to note that these are estimates based on current costs; the requirement is defined in terms of acres, not dollars per acre, and actual costs may vary.

Integrating State and Federal Desert Tortoise Mitigation

Staff from BLM, Energy Commission, USFWS, and CDFG agree that compensatory mitigation at the 3:1 and 1:1 ratios described above is appropriate for the Calico Solar Project's impacts to desert tortoise habitat. However, some differences remain between the federal and state approach to desert tortoise mitigation that currently preclude a complete integration of desert tortoise mitigation requirements. One difference is the state requirement for permanent protection of acquired mitigation lands. Energy Commission staff and CDFG require that mitigation lands acquired for endangered species be maintained and protected in perpetuity for the benefit of those species. The BLM cannot always make the same commitment to protecting acquired mitigation lands because their multiple use mandate restricts their ability to designate lands solely for conservation purposes and to exclude potentially incompatible development and activities.

The Renewable Energy Action Team Agencies (Energy Commission, BLM, CDFG, and USFWS) agree that to address the in perpetuity protection requirement, any lands acquired and subsequently donated to BLM will have either a deed restriction or conservation easement in title that will preclude future development of the land. The REAT Agencies also note that protection could be achieved by buying private in-holdings within designated wilderness or wilderness study areas, being that these areas

are congressionally designated and as such preclude any development within them, thus meeting the requirement for in perpetuity protection. The BLM has an established process for accepting lands with deed restrictions or conservation easements and is working on streamlined version of this process. Staff anticipates that the streamlined process for in-perpetuity protection of BLM mitigation lands will be established before the end of 2010 (Fesnock pers. comm., Flint pers. comm.).

Rather than just purchasing compensation lands, BLM may use a portion of the compensation funds to implement desert tortoise habitat enhancement measures. These measures may include, but would not be limited to: Construction of tortoise proof fencing along Hwy 247 to prevent desert tortoises from entering the roadway; installation of barrier fencing (e.g. post and cable) along Camp Rock Road to prevent unauthorized vehicular use of important tortoise habitat; or rehabilitation of administratively closed or undesignated routes within Ord-Rodman DWMA. Additionally, habitat enhancement such as exotic weed control, modifying mine openings to reduce or prevent risk of tortoises falling into them, and funding a headstart program for desert tortoise in coordination with the USFWS's Desert Tortoise Recovery Office may also be implemented with some of these funds.

Staff believes that habitat enhancement measures, in combination with habitat acquisition, would feasibly and effectively mitigate the project's impacts to desert tortoises. The measures outlined above are consistent with the USFWS desert tortoise recovery plan recommendations (USFWS 1994, 2008a), which describe actions in addition to land acquisition that could reduce threats to desert tortoise populations. Some of these recommended actions include habitat restoration and invasive plant control, eliminating livestock and burro grazing, fencing to exclude livestock and vehicles or reduce the incidence of road strikes, controlling tortoise predators such as ravens, feral dogs and coyotes, as well as increased law enforcement, signage and education. Staff agrees that fencing, retirement of grazing allotments, removal of burros, and habitat restoration show considerable promise as actions that could increase desert tortoise survivorship and reproduction in portions of the Mojave Desert. These measures would address specific known threats to desert tortoise as identified in the Recovery Plan (USFWS 1994b), Draft Revised Recovery Plan (2008a) and Spotlight Species Action Plan (USFWS 2009e). These threats, which would be relieved in part through the habitat enhancement measures listed above, include proliferation of roads; off-highway vehicle activity; deliberate maiming, killing, or collecting; habitat invasion by non-native invasive species; and increased frequency of wildfire due to invasion of desert habitats by non-native plant species.

The amount of the security deposit (calculated below) is based upon estimated cost to purchase and protect mitigation land at the ratios described above. BLM may use no more than the portion of the fund that corresponds to staff's estimated purchase and protection cost for 6,215 acres of desert tortoise habitat (i.e., a 1:1 ratio for the entire project site) to implement habitat enhancement measures as described above. The remainder of the mitigation obligation (i.e., the additional 2:1 compensation ratio for the 4,075 project site acres north of the BNSF railroad tracks, amounting to 8,150 acres of

compensation land) shall be used only for compensation land acquisition and protection, initial improvement and management.

Calculation of Security for Desert Tortoise Compensatory Mitigation

To satisfy section 2081 of the California Endangered Species Act, the applicant must provide financial assurances to guarantee that an adequate level of funding is available to implement all impact avoidance, minimization, and compensation measures described in the desert tortoise conditions of certification that are not carried out before project impacts occur. These financial assurances are generally provided in the form of an irrevocable letter of credit, a pledged savings account or another form of security prior to initiating ground-disturbing project activities. Staff's proposed conditions of certification typically specify the dollar amount of the security, and include a provision for adjusting that security amount when parcel-specific information is available. This security amount is calculated by multiplying the acreage of the impact area by the total per-acre costs, a figure which represents the sum of the costs required for: (1) land acquisition, (2) initial habitat improvements, and (3) a fund to support long-term management of the acquired lands.

The latter cost for the long-term management fund is typically the largest component of the mitigation fee. Interest from the fund provides enough income to cover annual stewardship costs on the acquired lands and includes a buffer to offset inflation. The amount for the fund is established by a Property Analysis Record (PAR), a computerized database methodology developed by the Center for Natural Lands Management (<www.cnlm.org/cms>) which calculates the costs of land management activities for a particular parcel. These activities include preparation of a desert tortoise management plan tailored for each parcel of mitigation land to assess habitat status, identify desired conditions, and develop plans to achieve conditions that would best support desert tortoise. Once the management plan is prepared and approved by the appropriate resource agencies, implementation of enhancement actions such as fencing, road closure, invasive plant control, habitat restoration, and monitoring can begin. The goal of these activities is to increase the carrying capacity of the acquired lands for desert tortoise and increase their population numbers by enhancing survivorship and reproduction.

Funding for the initial habitat improvements supports those actions needed immediately upon acquisition of the property to secure it and remove hazards. These activities might include fencing or debris clean-up, or other urgent remedial action identified prior to acquisition. When the management plan is completed for the acquired parcel, activities such as these are thereafter funded from the interest produced by the long-term management fund described above.

In contrast to CDFG's mitigation approach, BLM does not require a long-term maintenance and management fee or other funding to manage the acquired desert

tortoise mitigation lands To mitigate project impacts on BLM lands, BLM typically requires a cash payment (proffer) prior to initiating ground-disturbing activities, which generally includes a per-acre cost reflecting current land value and recent purchase prices, as well as additional acquisition and indirect costs and funding for appraisals, environmental site assessments, property cleanup, and an inflation contingency. BLM also pursues recovery goals through implementation of region-wide management plans and land use planning as described in the WEMO and the Desert Tortoise Recovery Plan (USFWS 1994) rather than through parcel by parcel acquisition and management. As noted by the REAT Agencies, mitigation methods may be employed which would satisfy both BLM and the State agency legal requirements.

The applicant may elect to purchase and permanently protect compensation lands itself; to fund the acquisition and initial improvement of compensation lands through NFWF by depositing funds for that purpose into NFWF's REAT Account; or to fund the acquisition of compensation lands through to a third party other than NFWF, as outlined in **BIO-17** and **BIO-30**. Further, **BIO-17** would require that the project owner provide financial assurances to guarantee an adequate level of funding to implement the compensation measures described above. Because there are several suitable options available to the applicant to satisfy the compensation requirement, and because mitigation requirements must satisfy the requirements of both state and federal Endangered Species Acts, staff's calculation of the security amount includes estimates of all transaction and management fees described above. These calculations are presented in **Biological Resources Table 7**.

Biological Resources Table 7
Desert Tortoise Compensation Cost Estimate[1]

	Task	Cost
1.	Land Acquisition	$1,000 per acre[2]
2.	Level 1 Environmental Site Assessment	$3,000 per parcel[3]
3.	Appraisal	$5,000 per parcel
4.	Initial site work - clean-up, enhancement , restoration	$250 per acre[4]
5.	Closing and Escrow Costs – 2 transactions at $2,500 each; ~~1 transaction includes~~ landowner to 3rd party and 3rd party to agency	$5,000 per ~~transaction~~parcel
6.	Biological survey for determining mitigation value of land (habitat based with species specific augmentation)	$5,000 per parcel
7.	3rd party administrative costs - includes staff time to work with agencies and landowners; develop management plan; oversee land transaction; organizational reporting and due diligence; review of acquisition documents; assembling acres to acquire….	10% of land acquisition cost (#1)
8.	Agency costs to review and determine accepting land donation - includes 2 physical inspections; review and approval of the Level 1 ESA assessment; review of all title documents; drafting deed and deed restrictions; issue escrow instructions; mapping the parcels….	15% of land acquisition costs (#1) × 1.17 (17% of the 15% for overhead)
	SUBTOTAL *- Acquisition & Initial Site Work*	***$28,393,807.50***
9.	Long-term Management and Maintenance (LTMM) Fund - includes land management; enforcement and defense of easement or title [short and long term]; monitoring….	$1,450 per acre[5]
	SUBTOTAL *- Acquisition, Initial Site Work, & LTMM*	***$49,223,057.50***
	NFWF Fees	
10.	Establish the project specific account	~~n/a (presumes establishment of desert tortoise account for project)~~$12,000
11.	Pre-proposal Modified RFP or RFP processing[6]	$30,000
11~~1~~2.	NFWF management fee for acquisition & initial site work	3% of SUBTOTAL
13~~2~~.	NFWF Management fee for LTMM Fund	1% of LTMM Fund
	TOTAL *for deposit in REAT-NFWF Project Specific Account*	***~~$50,295,164.23~~$50,325,164.23***

1. Estimates prepared in consultation with CDFG, USFWS, and BLM. All costs are best estimates as of summer 2010. Actual costs will be determined at the time of the transactions and may change the funding needed to implement the required mitigation obligation. Note: regardless of the estimates, the developer is responsible for providing adequate funding to implement the required mitigation.
2. Generalized estimate taking into consideration a likely jump in land costs due to demand, and an 18-24 month window to acquire the land after agency decisions are made. If the agencies, developer, or 3rd party has better, credible information on land costs in the specific area where project-specific mitigation lands are likely to be purchased, that data overrides this general estimate. Note: regardless of the estimates, the developer is responsible for providing adequate funding to implement the required mitigation.
3. For the purposes of determining costs, a parcel is 40 acres (based on input from CDD).
4. Based on information from CDFG.

5. Estimate for purposes of calculating general costs. The actual long term management and maintenance costs will be determined using a Property Assessment Report (PAR) tailored to the specific acquisition.
6. If determined necessary by the REAT agencies if multiple 3rd parties have expressed interest; for transparency and objective selection of 3rd party to carry out acquisition.

Indirect Impacts to Desert Tortoise

Approximately 24 adult and between 11-15 juveniles may occur within the 960 acre NAP Area A. An additional 37 adult tortoises and between17-39 juvenile tortoises could occur within 1000 feet of the project in adjacent habitat. The indirect effects of the Calico Solar Project to desert tortoise include loss of forage, burrowing sites, and cover sites, the spread of non-native invasive plants, loss of dispersal areas and connectivity to other areas, contracted home ranges, and increased risk of predation by predators attracted to the area by increased human activity. Each of these impacts is discussed in more detail below.

Ravens, Coyotes, and Other Predators

Human activities in the Calico Solar Project area potentially provide food or other attractants in the form of trash, litter, or water, which attract and subsidize unnaturally high numbers of tortoise predators such as the common raven, kit fox, and coyote. Common raven populations in some areas of the Mojave Desert increased 1,500% from 1968 to 1988 in response to expanding human use of the desert (Boarman 2002). Since ravens were scarce in this area prior to 1940, the current level of raven predation on juvenile desert tortoises is considered to be an unnatural occurrence (BLM 1990; USFWS 2008a). In addition to ravens, feral dogs have emerged as major predators of the tortoise. Dogs may range several miles into the desert and have been found digging up and killing desert tortoises (USFWS 1994; Evans 2001). Dogs brought to the project site with visitors may harass, injure, or kill desert tortoises, particularly if allowed off leash to roam freely in occupied desert tortoise habitat. Implementation of the worker environmental awareness training (Condition of Certification **BIO-6**) and restrictions on pets being brought to the site (Condition of Certification **BIO-11**) would reduce or eliminate the potential for these impacts. Construction and operation of the Calico Solar Project would increase raven and coyote presence in the project area. Ravens depend on human encroachment to expand into areas where they were previously absent or in low abundance.

Ravens habituate to human activities and are subsidized by the food and water, as well as roosting and nesting resources that are introduced or augmented by human encroachment. Ravens were observed during site visits of the Calico Solar Project site and a stick nest with raven feathers was observed along the railroad tracks. Ravens may also use the new transmission line structures as potential nest and perch sites increasing the potential for loss of tortoises from raven predation. Because of the agricultural lands west of the project near Daggett and access to water in the region,

ravens will continue to occupy this section of the desert. Small mammal, fox, coyote, rabbit, lizard, snake, and tortoise road kill along I-40 also provides an additional attractant and subsidy for opportunistic predators/scavengers such as ravens.

Construction and operation of the Calico Solar Project could provide new sources of food, water, and nesting sites that might draw unnaturally high numbers of tortoise predators such as the common raven. In addition, clearing and grading activities would result in the exposure of large numbers of fossorial species such as small rodents and reptiles. Many of these species are killed or injured during these activities and attract ravens and other opportunistic predators. Roads provide a ready source of raven food in the carcasses of small mammals and reptiles that result from vehicle collisions, and increased nesting opportunities are provided by human structures. Road kills would mount with increased Calico Solar Project construction and operations traffic, further exacerbating the raven/predator attractions and increasing desert tortoise predation levels. In addition, bird collisions with facility structures or transmission lines may also attract ravens. The Calico Solar area is already subject to elevated raven predation pressure and any loss of juvenile tortoise due to the further addition of raven subsidies could have a long-term effect on the tortoise population by reducing the recruitment of juvenile tortoises into the adult life stages (Boarman 2003). The effects of reduced recruitment may not be apparent for years because tortoises do not typically reach sexual maturity until approximately 15 to 20 years of age.

To reduce the impacts of increased raven presence at the Calico Solar Project site, the applicant has prepared a draft Raven Management Plan (SES 2009aa) and has recommended additional avoidance and minimization measures. Staff has incorporated these recommendations with proposed Conditions of Certification **BIO-8** (Impact Avoidance and Minimization Measures) and **BIO-18** (Raven Monitoring, Management, and Control Plan). These conditions would minimize the project's potential to cause increased predation on desert tortoise by ravens and other species in the project area by requiring a variety of impact avoidance and minimization measures to minimize and control trash and other human activities that tend to increase raven activity; and on-site raven activity management and control, and a per-acre contribution to support the USFWS Regional Raven Management Program (below).

Regional Approach to Raven Control

The USFWS, in cooperation with CDFG and BLM, has developed a comprehensive, regional raven management and monitoring program in the California Desert Conservation Area to address the regional, significant threat that increased numbers of common ravens pose to desert tortoise recovery efforts (USFWS 2010b). The Regional Raven Management Program will implement recommendations in the USFWS E*nvironmental Assessment to Implement a Desert Tortoise Recovery Plan Task: Reduce Common Raven Predation on the Desert Tortoise* (USFWS 2008b). To mitigate the Calico Solar Project's contribution to cumulative and indirect impacts on desert tortoise from raven predation, staff proposes that the applicant contribute toward

implementation of the Regional Raven Management Program (USFWS 2010b), as described in staff's proposed Condition of Certification **BIO-18**. To mitigate for the regional effects of ravens on desert tortoise, the applicant shall provide a onetime fee in the amount of $105.00 per acre and a 2% fund management fee to the REAT Account held by the National Fish and Wildlife Foundation (NFWF), for 6,215 acres of desert tortoise habitat disturbed by the project. This payment of ~~$652,575~~ $665,626.50 would support the regional raven management plan activities focused within the Mojave Desert Recovery Unit, which would be adversely affected by increases in raven subsidies attributable to the proposed project. The fees contributed by the applicant would fund staff who would implement the raven removal actions, education and outreach efforts, and surveying and monitoring activities identified in the federal Environmental Assessment (USFWS 2008b). Staff has concluded that that implementation of these actions would be an effective means of reducing the project's cumulative contributions to desert tortoise predation from increased raven numbers; would reduce the impacts below a level of significance; and would satisfy the requirements of the CDFG for full mitigation pursuant to CESA.

The applicant's Raven Management Plan would involve identifying and preventing conditions that might attract or support ravens (for example, eliminating food sources such as garbage or roadkill and minimizing creation of structures that could provide ravens perches, nests, or roosts), monitoring the effectiveness of raven management and control measures, and then implementing additional adaptive management measures to make sure that the project does not result in an increase in raven numbers. Implementation of measures in Condition of Certification **BIO-18** would avoid or minimize the contributions of the project to increased desert tortoise predation from ravens to less-than-significant levels.

Increased Risk from Roads/Traffic

Vehicle traffic would increase as a result of construction and improvement of access roads, increasing the risk of injuring or killing desert tortoise. Construction of the Calico Solar Project would occur over a four-year period and access through Hector Road could result in mortality of desert tortoises by vehicle strikes. The potential for increased traffic-related tortoise mortality is greatest along paved roads where vehicle frequency and speed is greatest though tortoises on dirt roads may also be affected depending on vehicle frequency and speed. Data indicate that desert tortoise numbers decline as vehicle use increases (Bury et al. 1977) and that tortoise sign increases with increased distance from roads (Nicholson 1978; Karl 1989; von Seckendorf and Marlow 1997, 2002). Additional unauthorized impacts that may occur from casual use of the access roads in the project area include unauthorized trail creation. To minimize the risks of increased traffic fatality and other hazards associated with roads at the Calico Solar project site, the applicant has proposed a variety of minimization measures which staff has incorporated into Condition of Certification **BIO-8**. These measures include confining vehicular traffic to and from the project site to existing routes of travel, prohibiting cross country vehicle and equipment use outside designated work areas, and imposing a speed limit of 25 miles per hour on Hector Road and other dirt access

routes within desert tortoise habitat. The implementation of measures in **BIO-18** would further reduce subsidies for desert tortoise predators through the collection and management of road kill.

Conclusion – Impacts and Mitigation for Desert Tortoise

Staff based the impact analysis and translocation requirements on the expected numbers of desert tortoise on the site (i.e. 93 adult/subadult and 96 juvenile tortoises), projected from available field data. Based on this assumption, 436 desert tortoise eggs are also expected on the site . This estimate utilizes the mid range value of 93 desert tortoises within the 95 percent confidence interval. This confidence interval indicates the reliability of the estimate (i.e., a wider confidence interval indicates that less certainty is associated with the estimate). The 95 percent confidence interval for this estimate ranges from a low of 47 tortoises to a high of 185 adult individuals.

Staff concludes that the proposed project would result in direct mortality to all 436 eggs and 82 juvenile tortoises that may occur in the project area. Staff concludes that the Applicant will be required to translocate 107 tortoises (93 adults and 14 juveniles). In total this will require the Applicant to handle, radio tag, and disease test 321 tortoises. This figure represents tortoises that are translocated from the project site, the host population, and the control site.

Using the estimated mortality figures provided by CDFG, indirect effects to desert tortoise from translocation mortality could be as high as 112 tortoises. However staff considers the expected mortality rates to be lower. Adding the potential loss of 436 eggs and up to 82 juveniles not detected during the clearance surveys the proposed project could result in the mortality of up to 194 tortoises and 436 eggs.

Based on the number of tortoises expected to occur in the project area and the tortoise density at the proposed translocation sites the applicant will be required to find additional translocation areas to accommodate the number of tortoise that may require translocation.

However, staff notes that the total number of tortoise on the project site could be as low as 47 adult tortoises or as high of 185 adult tortoises. Should tortoise numbers be lower than assumed the associated impacts to adults, juveniles, eggs and tortoises at the proposed host and translocation sites would be correspondingly lower as well. Should the number of tortoise detected on the project site during the translocation events exceed the 107 identified for translocation in the SSA, the Applicant would be required to cease the translocation efforts and coordinate with the CPM, USFWS, BLM and CDFG.

Staff's proposed Conditions of Certification **BIO-1** through **BIO-9** describe measures that would avoid and minimize direct impacts to sensitive biological resources, including desert tortoise. Staff's proposed Conditions of Certification **BIO-15** through **BIO-17**

would require additional measures specific to desert tortoise, including installation of tortoise exclusion fencing; pre-construction clearance surveys; monitoring; verification that all desert tortoise impact avoidance, minimization, and compensation measures to replace lost habitat are implemented; translocation of tortoises from the project area; and acquisition of compensation lands. Staff's proposed Condition of Certification **BIO-18** would require the preparation and implementation of a Raven Monitoring, Management, and Control Plan which would minimize impacts to desert tortoise resulting from increases in raven populations.

Staff concludes that implementation of these conditions would reduce impacts to desert tortoise to less-than-significant levels under CEQA and would also satisfy the CESA requirements to fully mitigate impacts to desert tortoise under Fish and Game Code Section 2081. The conditions would minimize habitat disturbance to only that necessary for project development; would prevent desert tortoises from entering the project site through installation of exclusion fencing; would require removal and translocation of tortoises now present on the project site and those detected during project development; and would compensate for habitat loss through off-site habitat acquisition. All of these measures would be monitored and verified.

C.2.7 PROJECT-RELATED FUTURE ACTIONS, PAGES C.2-121

West Mojave Management Plan. The transmission corridor would cross through the Ord-Rodman Desert Wildlife Management Area (DWMA), the Pisgah Area of Critical Environmental Concern (ACEC), and the Upper Johnson Valley Yucca Rings ACEC. The West Mojave Plan area, which includes the SCE upgrades, establishes a "one percent" threshold for new ground disturbance within each DWMA and development guidelines are provided in management plans developed for each individual ACEC. The report does not specify the extent of impacts (i.e., acreage and linear distance) to the Ord-Rodman DWMA, and with respect to the Upper Johnson Valley Yucca Rings ACEC, it states the existing right-of-way corridor "is presumed to be included in the ACEC management plan." (BLM et al. 2005).

In addition to meeting the cumulative limitation on ground disturbance, projects on lands covered by the Plan would be required to a pay a mitigation fee. ~~Under the Plan, incidental take of white-margined beardtongue is limited to 50 acres of occupied and potential habitat.~~ In addition, take as a result of utility construction is only allowed where avoidance is infeasible. It's not clear whether the SCE upgrades to the Pisgah to Lugo transmission line would comply with these requirements of the Plan as currently proposed.

It appears that the upgraded Pisgah to Lugo transmission line would go directly through the Upper Johnson Valley Yucca Rings ACEC. The applicant's report does not discuss the impacts of the upgrades on protected resources within this ACEC, or whether the

project would comply with the California Desert Conservation Area Plan Amendment that protects the ACEC (SES 2008 – Appendix EE).

CONDITION OF CERTIFICATION BIO-8, PAGES C.2-174 TO C.2-178

IMPACT AVOIDANCE AND MINIMIZATION MEASURES

BIO-8 The project owner shall undertake the following measures to manage the construction site and related facilities in a manner to avoid or minimize impacts to biological resources. All measures shall be subject to review and approval by the CPM.

1. Limit Disturbance Areas and Perimeter Fencing. The boundaries of all areas to be disturbed (including staging areas, access roads, and sites for temporary placement of spoils) shall be delineated with stakes and flagging prior to construction activities in consultation with the Designated Biologist. Spoils and topsoil shall be stockpiled in disturbed areas lacking native vegetation and which do not provide habitat for special-status species. Parking areas, staging and disposal site locations shall similarly be located in areas without native vegetation or special-status species habitat. All disturbances, project vehicles, and equipment shall be confined to the flagged areas. Tortoise fencing shall be placed along the outside perimeter of the access road that would provide access to areas north of the project site.

2. Minimize Road Impacts. New and existing roads that are planned for construction, widening, or other improvements shall not extend beyond the flagged impact area as described above. All vehicles passing or turning around would do so within the planned impact area or in previously disturbed areas. Where new access is required outside of existing roads or the construction zone, the route shall be clearly marked (i.e., flagged and/or staked) prior to the onset of construction.

3. Minimize Traffic Impacts. Vehicular traffic during project construction and operation shall be confined to existing designated routes of travel to and from the project site, and cross country vehicle and equipment use outside designated work areas shall be prohibited. The speed limit shall not exceed 25 miles per hour within the project area, on maintenance roads for linear facilities, or on access roads to the project site. Speed limits on paved roads shall be consisted with posted speed limits.

4. Monitor During Construction. Due to the likelihood that juvenile desert tortoises may persist on the site after desert tortoise clearance surveys and exclusion fencing are completed, ~~In areas that have not been fenced with desert tortoise exclusion fencing and cleared,~~ the Designated Biologist or Biological Monitor shall be present at the construction site during all project activities that have potential to disturb soil, vegetation, and wildlife. The Designated Biologist or Biological Monitor shall walk

immediately ahead of equipment during brushing and grading activities. Any time over the life of the project that a desert tortoise is found within the exclusion fencing, the Designated Biologist shall immediately contact the CPM, CDFG, BLM and USFWS; monitor the tortoise's location and activities; and implement translocation of the animal in accordance with and the approved Desert Tortoise Translocation Plan and in consultation with the USFWS, CDFG, BLM, and CPM.

5. Minimize Impacts of Transmission/Pipeline Alignments, Roads, Staging Areas. Staging areas for construction on the plant site shall be within the area that has been fenced with desert tortoise exclusion fencing and cleared. For construction activities outside of the plant site (transmission line, pipeline alignments) access roads, pulling sites, and storage and parking areas shall be designed, installed, and maintained with the goal of minimizing impacts to native plant communities and sensitive biological resources. Transmission lines and all electrical components shall be designed, installed, and maintained in accordance with the Avian Power Line Interaction Committee's (APLIC's) S*uggested Practices for Avian Protection on Power Lines* (APLIC 2006) and *Mitigating Bird Collisions with Power Lines* (APLIC 2004) to reduce the likelihood of large bird electrocutions and collisions.
6. Avoid Use of Toxic Substances. Soil bonding and weighting agents used on unpaved surfaces shall be non-toxic to wildlife and plants.
7. Minimize Lighting Impacts. Facility lighting shall be designed, installed, and maintained to prevent side casting of light towards wildlife habitat.
8. Avoid Vehicle Impacts to Desert Tortoise. Parking and storage shall occur within the area enclosed by desert tortoise exclusion fencing to the extent feasible. No vehicles or construction equipment parked outside the fenced area shall be moved prior to an inspection of the ground beneath the vehicle for the presence of desert tortoise. If a desert tortoise is observed, it shall be left to move on its own. If it does not move within 15 minutes, a Designated Biologist or Biological Monitor under the Designated Biologist's direct supervision may remove and relocate the animal to a safe location if temperatures are within the range described in the USFWS' 2009 *Desert Tortoise Field Manual* (http://www.fws.gov/ventura/speciesinfo/protocols_guidelines). All tortoise translocation will be consistent with the measures identified in the Desert Tortoise Translocation Plan. All access roads outside of the fenced project footprint shall be delineated with temporary desert tortoise exclusion fencing on either side of the access road, unless otherwise authorized by the CPM, BLM Wildlife Biologist, USFWS, and CDFG.
9. Avoid Wildlife Pitfalls:
    a. Avoid Wildlife Entrapment. At the end of each work day, the Designated Biologist shall ensure that all potential wildlife pitfalls

(trenches, bores, and other excavations) have been backfilled. If backfilling is not done, all trenches, bores, and other excavations shall be sloped at a 3:1 ratio at the ends to provide wildlife escape ramps, or covered completely to prevent wildlife access, or fully enclosed with desert tortoise-exclusion fencing. All trenches, bores, and other excavations outside the areas permanently fenced with desert tortoise exclusion fencing shall be inspected periodically, but no less than three times, throughout the day and at the end of each workday by the Designated Biologist or a Biological Monitor. Should a tortoise or other wildlife become trapped, the Designated Biologist or Biological Monitor shall remove and relocate the individual as described in the Desert Tortoise Relocation/Translocation Plan. Any wildlife encountered during the course of construction shall be allowed to leave the construction area unharmed.

b. Avoid Entrapment of Desert Tortoise. Any construction pipe, culvert, or similar structure with a diameter greater than 3 inches, stored less than 8 inches aboveground~~, and within desert tortoise habitat (i.e., outside the permanently fenced area)~~ for one or more nights, shall be inspected for tortoises before the material is moved, buried, or capped. As an alternative, all such structures may be capped before being stored outside the fenced area, or placed on pipe racks. ~~These materials would not need to be inspected or capped if they are stored within the permanently fenced area after the clearance surveys have been completed.~~

10. Minimize Standing Water. Water applied to dirt roads and construction areas (trenches or spoil piles) for dust abatement shall use the minimal amount needed to meet safety and air quality standards in an effort to prevent the formation of puddles, which could attract desert tortoises and common ravens to construction sites. A Biological Monitor shall patrol these areas to ensure water does not puddle and shall take appropriate action to reduce water application where necessary.

11. Dispose of Road-killed Animals. Road-killed animals or other carcasses detected on roads near the project area shall be picked up immediately and delivered to the Biological Monitor. For special-status species roadkill, the Biological Monitor shall contact USFWS and CDFG within 1 working day of receipt of the carcass for guidance on disposal or storage of the carcass. The Biological Monitor shall report the special-status species record as described in Conditions of Certification **BIO-2** and **BIO-26**.

12. Minimize Spills of Hazardous Materials. All vehicles and equipment shall be maintained in proper working condition to minimize the potential for fugitive emissions of motor oil, antifreeze, hydraulic fluid, grease, or other hazardous materials. The Designated Biologist shall be informed of any hazardous spills immediately as directed in the project Hazardous

Materials Plan. Hazardous spills shall be immediately cleaned up and the contaminated soil properly disposed of at a licensed facility. Servicing of construction equipment shall take place only at a designated area. Service/maintenance vehicles shall carry a bucket and pads to absorb leaks or spills.

13. Worker Guidelines. During construction all trash and food-related waste shall be placed in self-closing containers and removed ~~daily~~ from the site regularly to prevent overflow. Workers shall not feed wildlife or bring pets to the project site. Except for law enforcement personnel, no workers or visitors to the site shall bring firearms or weapons. Vehicular traffic shall be confined to existing routes of travel to and from the project site, and cross country vehicle and equipment use outside designated work areas shall be prohibited. The speed limit when traveling on dirt access routes within desert tortoise habitat shall not exceed 25 miles per hour.

14. Implement Erosion Control Measures. Standard erosion control measures shall be implemented for all phases of construction and operation to prevent any ~~where~~sediment run-off from exposed slopes from ~~threatens to~~ entering state-jurisdictional streambeds on or off the Project site. ~~"Waters of the State".~~ Sediment and other flow-restricting materials shall be moved to a location where they shall not be washed back into the streambed. All disturbed soils and roads within the project site shall be stabilized to reduce erosion potential, both during and following construction, except that soil stabilizer use may be limited in portions of roads crossing washes or stream channels consistent with applicable water quality requirements. ~~. Areas of disturbed soils (access and staging areas) with slopes toward a drainage shall be stabilized to reduce erosion potential.~~

15. Monitor Ground-Disturbing Activities Prior to Pre-Construction Site Mobilization. If pre-construction site mobilization requires ground-disturbing activities such as for geotechnical borings or hazardous waste evaluations, a Designated Biologist or Biological Monitor shall be present to monitor any actions that could disturb soil, vegetation, or wildlife.

16. Control and Regulate Fugitive Dust. To reduce the potential for the transmission of fugitive dust the project owner shall implement dust control measures. These shall include:

    a. The project owner shall apply non-toxic soil binders, equivalent or better in efficiencies than the CARB-approved soil binders, to active unpaved roadways, unpaved staging areas, and unpaved parking area(s) throughout construction to reduce fugitive dust emissions.

    b. Water the disturbed areas of the active construction sites at least three times per day and more often if uncontrolled fugitive dust is noted.

c. Enclose, cover, water twice daily, and/or apply non-toxic soil binders according to manufacturer's specifications to exposed piles with a 5% or greater silt content.

d. Establish a vegetative ground cover, consistent with **BIO-10,** ~~(in compliance with biological resources impact conditions of certification)~~ or otherwise create stabilized surfaces on all unpaved areas at each of the construction sites within 21 days after active construction operations have ceased, consistent with erosion control measures described above.

e. Increase the frequency of watering, if water is used as a soil binder for disturbed surfaces, or implement other additional fugitive dust mitigation measures, to all active disturbed fugitive dust emission sources when wind speeds (as instantaneous wind gusts) exceed 25 mph.

Verification: All mitigation measures and their implementation methods shall be included in the BRMIMP and implemented. Implementation of the measures shall be reported in the Monthly Compliance Reports by the Designated Biologist. Within 30 days after completion of project construction, the project owner shall provide to BLM's Wildlife Biologist and the CPM, for review and approval, a written construction termination report identifying how measures have been completed.

CONDITION OF CERTIFICATION BIO-10, PAGES C.2-181 TO C.2-183

REVEGETATION PLAN AND COMPENSATION FOR IMPACTS TO NATIVE VEGETATION COMMUNITIES

BIO-10 The project owner shall provide restoration/compensation for impacts to native vegetation communities and develop and implement a Revegetation Plan for all areas subject to temporary project disturbance, including but not limited to linear features and berms of detention or debris basins, to the extent permitted by stormwater control requirements. Upon completion of construction, all temporarily disturbed areas shall be restored to pre-project grade and revegetated according to the measures described below. Temporarily disturbed areas within the project area include, but are not limited to: all areas where underground infrastructure was installed, temporary access roads, construction work temporary lay-down areas, and construction equipment staging areas. For the purpose of this mitigation measure, "temporarily disturbed areas" shall include disturbances that are considered permanent impacts in the analyses above (i.e., would take more than 5 years to recover) but would benefit from the revegetation activities identified here. The following measures shall be implemented for all temporarily disturbed areas, excluding areas immediately around facilities which may be landscaped according to a separate Landscape Plan. These measures will include:

1. Plan Details. The plans shall include at minimum: (a) locations and details for top soil storage; (b) methods to salvage and replant cacti, yucca or ~~and~~ other species described in **BIO-12** Section E, or to plant out nursery stock of these species onto revegetation sites; ~~the plant species to be used in restoration~~; (c) seed collection guidelines; (d) a schematic depicting the mitigation area; (e) time of year that the planting will occur and the methodology of the planting; (f) a description of the irrigation methodology if used; (g) measures to control exotic vegetation on site; (h) performance standards (see below); and (i) a detailed monitoring program. All habitats dominated by non-native species prior to project disturbance shall be revegetated using appropriate native species. This plan shall also contain contingency measures for failed restoration efforts (efforts not meeting success criteria).

2. Topsoil Salvage. Topsoil shall be stockpiled from the project site for use in revegetation of the disturbed soils. The topsoil excavated shall be segregated, kept intact, and protected, under conditions shown to sustain seed bank viability. The upper 1 inch of topsoil which contains the seed bank shall be scraped and stockpiled for use as the top-dressing for the revegetation area. An additional 6 to 8 inches of soil below the top 1 inch of soil shall also be scraped and separately stockpiled for use in revegetation areas. Topsoil shall be replaced in its original vertical orientation following ground disturbance, ensuring the integrity of the top one inch in particular. All other elements of soil stockpiling shall be conducted as described on pages 39-40 of *Rehabilitation of Disturbed Lands in California* (Newton and Claassen 2003).

3. Seed and Nursery Stock. Only seed or potted nursery stock of locally occurring native species shall be used for revegetation. Seeds shall contain a mix of short-lived early pioneer species such as native annuals and perennials and subshrubs. Seeding and planting shall be conducted as described in Chapter 5 of *Rehabilitation of Disturbed Lands in California* (Newton and Claassen 2003). A list of plant species suitable for Mojave Desert region revegetation projects, including recommended seed treatments, are included in Appendix A-8 of the same report. The list of plants observed during the 2010 special-status plant surveys of the Project area can also be used as a guide to site-specific plant selection for revegetation. In conformance with BLM policy, the project owner shall include salvaged or nursery stock yucca (all species), cacti (excluding cholla species, genus *Cylindropuntia*), smoke tree, mesquites, and desert ironwood in revegetation plans and implementation, as described in **BIO-12** Section E.

4. Monitoring Requirement and Performance Standards. Post-seeding and planting monitoring will be yearly and shall continue for a period of no less than 10 years or until the defined performance standards are achieved (whichever is later). Remediation activities (e.g., additional planting,

removal of non-native invasive species, or erosion control) shall be taken during the 10-year period if necessary to ensure the success of the restoration effort. If the mitigation fails to meet the established performance standards after the 10-year maintenance and monitoring period, monitoring and remedial activities shall extend beyond the 10-year period until the performance standards are met, unless otherwise specified by the Energy Commission and BLM. As needed to achieve performance standards, the project owner shall be responsible for replacement planting or other remedial action as agreed to by BLM and CPM. Replacement plants shall be monitored with the same survival and growth requirements as required for original revegetation plantings. The following performance standards must be met by the end of the monitoring period: (a) at least 80% of the species and vegetative cover observed within the temporarily disturbed areas shall be native species that naturally occur in desert scrub habitats; (b) absolute cover and density of native plant species within the revegetated areas shall equal at least 60% of the pre-disturbance or reference vegetation cover; and (c) the site shall have gone without irrigation or remedial planting for a minimum of three years prior to completion of monitoring.

5. If a fire or flood damages a revegetation area within the 10-year monitoring period, the owner shall be responsible for a one-time replacement. If a second fire or flood occurs, no replanting is required, unless the event is caused by the owner's activity (e.g., as determined by BLM or other firefighting agency investigation).

Verification: All mitigation measures and their implementation methods shall be included in the BRMIMP and implemented. Within 90 days after completion of each year of project construction, the project owner shall provide to the CPM verification of the total vegetation ~~and community~~ acreage subject to temporary and permanent disturbance. To monitor and evaluate the success of the revegetation~~storation~~, the project owner shall submit annual reports of the revegetation~~storation~~ including the status of the site, percent cover of native and exotics, and any remedial actions conducted by the owner to the CPM and BLM Wildlife Biologist.

No less than 30 days following the publication of the Energy Commission License Decision or the Record of Decision/ROW Issuance, whichever comes first, the project owner shall submit to the CPM and BLM's Wildlife Biologist a final agency-approved Revegetation Plan that has been reviewed and approved by BLM's Wildlife Biologist and the CPM. The Plan shall include a Plant Salvage and Replacement Section as described in **BIO-12** Section E. All modifications to the Revegetation Plan shall be made only after approval from BLM's Wildlife Biologist and the CPM.

Within 30 days after completion of each year of project construction, the project owner shall provide to the CPM for review and approval, a written report identifying which items of the Revegetation Plan have been completed, a summary of all modifications to

mitigation measures made during the project's construction phase, and which items are still outstanding.

On January 31st of each year following construction until the completion of the revegetation monitoring specified in the Revegetation Plan, the Designated Biologist shall provide a report to the CPM and BLM's Wildlife Biologist that includes: a summary of revegetation activities for the year, a discussion of whether revegetation performance standards for the year were met; and recommendations for revegetation remedial action, if warranted, are planned for the upcoming year.

CONDITION OF CERTIFICATION BIO-12, PAGES C.2-185 TO C.2-203

SPECIAL-STATUS PLANT IMPACT AVOIDANCE AND MINIMIZATION

BIO-12 This condition contains the following five sections:

- **Section A: White-margined Beardtongue Avoidance and Minimization Measures** describes measures to protect all white-margined beardtongue plants located within the project area or within 250 feet of its boundaries (including access roads, staging areas, laydown areas, parking and storage areas) from accidental and indirect impacts during construction, operation, and closure.
- **Section B: Conduct Late Season Botanical Surveys** describes guidelines for conducting summer-fall 2010 surveys to detect special-status plants that would have been missed during the spring 2010 surveys.
- **Section C: ~~Avoidance~~ Mitigation Requirements for Special-Status Plants Detected in the Summer/Fall 2010 Surveys** outlines the level of avoidance required for plants detected during the summer-fall surveys, based on the species' rarity and conservation status ~~codes~~. Avoidance is based on extent of local occurrences on the project site and, as applicable, extending onto contiguous public land. Where avoidance would result in on-site isolation of plant occurrences from essential ecological processes, or would cause local populations to become inviable, then off-site compensation would be allowed.
- **Section D: Off-Site Compensatory Mitigation for Special-Status Plants** describes performance standards for mitigation for a range of options for compensatory mitigation through acquisition, restoration/enhancement, or a combination of acquisition and restoration/enhancement, based on the species' rarity and conservation status.
- **Section E: Plant Salvage ~~Conformance with BLM and San Bernardino County Plant Protection Policies~~** describes measures to include potted nursery stock or salvaged specimens of certain ~~and transplant certain cactu~~cacti, yucca, and other species listed in San Bernardino County plant

protection policies in revegetation plans, in conformance with BLM ~~and~~ policy.

"Project Disturbance Area" encompasses all areas to be temporarily and permanently disturbed by the Project, including the plant site, linear facilities, and areas disturbed by temporary access roads, fence installation, construction work lay-down and staging areas, parking, storage, or by any other activities resulting in disturbance to soil or vegetation. Nothing in this condition requires the project owner to conduct botanical surveys on private lands adjacent to the project site when the project owner has made reasonable attempts to obtain permission to enter the property for survey work but was unable to obtain such permission.

The Project owner shall implement the following measures in Section A, B, C, D and E to avoid, minimize, and compensate for impacts to certain special-status plant species, based on species rarity and conservation status:

SECTION A: WHITE-MARGINED BEARDTONGUE AVOIDANCE AND MINIMIZATION MEASURES

To protect all white-margined beardtongue plants located within the project area or within 250 feet of its boundaries (including access roads, staging areas, laydown areas, parking and storage areas) from accidental and indirect impacts during construction, operation, and closure, the Project owner shall implement the following measures:

1. Designated Botanist. An experienced botanist who meets the qualifications described in Section **B-2** below shall oversee compliance with all special-status plant avoidance, minimization, and compensation measures described in this condition throughout construction, operation, and closure. The Designated Botanist shall oversee and train all other Biological Monitors tasked with conducting botanical survey and monitoring work.

2. White-margined Beardtongue Impact Avoidance and Minimization Plan. The Project owner shall prepare and implement a White-margined Beardtongue Impact Avoidance and Minimization Plan and shall incorporate the Plan into the BRMIMP (**BIO-7**). The Plan shall be designed to prevent direct or indirect effects of project construction and operation to all white-margined beardtongue occurrences within the project boundary, and to any other special status plants including small-flowered androstephium located within Environmentally Sensitive Areas (defined below). The Plan shall include the following elements:

    a. Designate Environmentally Sensitive Areas (ESAs). Before construction, designate ESAs to protect all known white-margined

beardtongue locations on the project site or within 250 feet of site boundaries. The ESAs shall include, at minimum, the approximately 18 acres of white-margined beardtongue occurrences as identified on Applicant's Exhibit 57, Alternative Site Layout #2. The locations of ESAs shall be clearly depicted on construction drawings, which shall also include all avoidance and minimization measures on the margins of the construction plans. The boundaries of the ESAs shall ~~be~~ provide a minimum of 250 feet buffer area between white-margined beardtongue plant locations and any ground-disturbing project activity. The ESAs shall be clearly delineated in the field with permanent fencing and signs prohibiting movement of the fence under penalty of work stoppages and additional compensatory mitigation. ESAs shall also be permanently marked (with signage or other markers) to ensure that avoided plants are not inadvertently harmed during construction, operation, or closure.

b. Baseline data. Document baseline conditions, including numbers and areal extent of white-margined beardtongue and any other special-status plant occurrences within the ESAs;

c. Success criteria. Specify success standards for protection of special-status plant occurrences within the ESAs, and identify specific triggers for remedial action (e.g., numbers of plants dropping below a threshold);

d. Literature review. Describe and reference any available information about microhabitat preferences and fecundity, essential pollinators, reproductive biology, and propagation and culture requirements for white-margined beardtongue and any other special-status species within the ESAs;

e. Protection and avoidance measures. Describe measures (e.g., fencing, signage) to avoid direct and indirect construction and operation impacts to special-status plants within the ESAs; these shall include but shall not be limited to: (1) training components specific to protection of white-margined beardtongue and surrounding habitat buffer area, which shall be incorporated into the WEAP described in **BIO-6**; (2) detailed specifications for avoiding herbicide and soil stabilizer drift, and shall include a list of herbicides and soil stabilizers that may be used on the Project with manufacturer's guidance on appropriate use; the Plan shall reference the Weed Management Plan (see Condition of Certification **BIO-11**) and shall be consistent with provisions of that Plan; (3) measures to ensure that erosion and sediment control do not inadvertently impact special-status plants located within an ESA

(e.g., by using invasive or non-native plants in seed mixes, introducing pest plants through contaminated seed or straw, etc.). Where applicable, these measures shall be incorporated in the Weed Management Plan and Storm Water Pollution Prevention Plan. Also, designate spoil areas; equipment, vehicle, and materials storage areas; parking; equipment and vehicle maintenance areas, and; wash areas at least 100 feet from boundaries of any ESAs;

f. Monitoring and Reporting Requirements. The Designated Botanist shall conduct weekly monitoring of the ESAs during any construction~~, operation,~~ or decommissioning activities within 100 feet of the ESAs, and quarterly monitoring for the remainder of construction and during operations. The Project owner shall also conduct annual monitoring of the avoided occurrences within ESAs on-site, and off-site occurrences that are adjacent to the Project site, for the life of the Project (see Verification, below).

g. Remedial Action Measures. Specify remedial action measures to be implemented if success standards (above) are not met at any time during the life of the project;

h. Seed Collection. Over the life of the project, the project owner shall collect a small proportion of any seed produced by white-margined beardtongue plants protected on-site within ESAs. Seed collection must only be done under permit from the BLM; the project owner shall be responsible for obtaining and complying with applicable permit(s). The collection technique shall follow seed collection and storage guidelines contained in (Wall 2009a; Bainbridge 2007). Collection of seed shall be done by the Rancho Santa Ana Botanic Garden (RSABG) Conservation Program staff or other qualified seed or restoration specialist. The Project owner shall be responsible for all costs associated with seed collection and storage. All seed storage shall occur at RSABG or other qualified research institution and at least 40 percent of the collected seed shall remain in long-term storage at RSABG Seed Conservation Program, San Diego Natural History Museum, or other qualified seed conservation program;

i. Propagation research. The project own shall be responsible for evaluating potential white-margined beardtongue propagation and reintroduction methods with the objective of developing horticultural techniques suitable for eventual introduction of nursery-grown white-margined beardtongue ~~implementation~~ on-site or off-site as remedial action measures if needed (paragraph g., above); a portion of seed (paragraph h., above) shall be made available for propagation research which may at some time inform contingency

propagation efforts on the project site or elsewhere; propagation experimentation shall be funded by the project owner and conducted by a qualified research institution such as Rancho Santa Ana Botanic Garden and the results shall not be subject to a non-disclosure agreement. At minimum, propagation research shall include germination and seedling establishment trials under a variety of soil and humidity conditions reflecting the range of seasonal conditions found in the plant's natural habitat on the project site; plant growth from seedling to nursery stock size; and transplantation methods. These trials shall be conducted in part within growth chambers where temperature and humidity are controlled and in part on the project site or adjacent Pisgah ACEC under natural conditions.

j. Off-site sand transport monitoring and management. The White-margined Beardtongue Impact Avoidance and Minimization Plan shall include a sand transport monitoring and management to document and manage project effects to eastward sand transport to occupied white-margined beardtongue aeolian sand habitat off-site to the east. At minimum, the plan shall include the following elements (1) quantify baseline eastward sand transport from the project area into the adjacent BLM Pisgah Crater ACEC, following methods described by Etyemezian et al. (2010); (2) specify methods and schedule for annual sand transport monitoring throughout the first five years of the project's life; (3) identification of thresholds which would trigger remediation requirements; and (4) development of adaptive management strategies to supplement eastward sand transport into the ACEC if needed. These strategies may include revisions to project fencing design, importing sand from off-site, or transporting sand across the project site for further dispersal. No sand transport remediation work would be permitted to cause new land disturbance outside the project area as analyzed in this SSA.

k. Off-site weed monitoring and management. The White-margined Beardtongue Impact Avoidance and Minimization Plan shall include methods and schedule to monitor and manage weed abundance in occupied and suitable white-margined beardtongue habitat to the east. At minimum, the plan shall (1) quantify baseline weed abundance in the portion of the ACEC adjacent BLM Pisgah Crater ACEC, adjacent to and within 500 m of the eastern project boundary, north of the BNSF railroad tracks; (2) weed abundance monitoring schedule and methods to implement throughout that area by collecting and analyzing quantitative weed abundance during every year of average or greater rainfall throughout the life of

the project; (3) identify weed abundance thresholds which would trigger remediation requirements; and (4) specify weed control methods to be implemented as needed in occupied and suitable white-margined beardtongue habitat throughout the area described above.

SECTION B: CONDUCT LATE-SEASON BOTANICAL SURVEYS

The Project owner shall conduct late-summer/fall botanical surveys for late-season special-status plants as described below:

1. Survey Timing. To the extent feasible, surveys shall be timed to detect: a) summer annuals triggered to germinate by the warm, tropical summer storms (which may occur any time between June and October), and b) fall-blooming perennials that respond to the cooler, later season storms that originate in the Pacific northwest (typically beginning in September or October), if identification may require leaves, flowers, or other structures not available during spring surveys previously completed. The survey dates shall be based on plant phenology and the timing of a significant storm (i.e., a 10 mm or greater rain or multiple storm events of sufficient volume to trigger germination, as measured at or within 1 mile of the Project site) if an event is recorded. Surveys for summer annuals shall be timed as needed and feasible to identify target species (below), based upon field visits to reference populations. ~~. occur approximately 4 to 7 weeks following a warm, tropical storm. Re-surveys shall occur as many times as necessary to ensure that surveys are conducted during the appropriate identification period for the target taxa, which may be blooms, fruit, seed characteristics, or vegetative characteristics, depending on the taxon.~~ However, due to the undependable nature and scattered patterns of summer and early fall rainfall, it is possible that no suitable rain event will be documented in the area. Nevertheless, the project own shall be responsible for conducting late-season botanical surveys along washes and other lowland areas on-site due to the possibility that rainstorms in the Cady Mountains may go undetected, but may initiate summer or fall blooms.

2. Surveyor Qualifications and Training. Surveys shall be conducted by a qualified botanist knowledgeable in the complex biology of the local flora, and consistent with CDFG (2009) and BLM (2009) protocols. The botanical survey crew shall be prepared to mobilize quickly to conduct appropriately timed surveys. Each field botanist shall be equipped with a GPS unit and record a complete tracklog; these data shall be compiled and submitted along with the Summer-Fall Survey Botanical Report (described below). Prior to the start of surveys, all crew members shall, at a minimum, visit target species reference sites (where available) and/or

review herbarium specimens to confirm detectability and obtain a search image.

3. Target Species. Field surveys shall be designed and scheduled to locate target species, defined as ~~of~~ all BLM Sensitive plants, CNPS List 1B or 2 (Nature Serve rank S1 and S2) or proposed List 1B or 2 taxa, and any newly reported or documented taxa~~to obtain a search image~~. Because the potential for range extensions is unknown ~~are likely to be found~~, the list of potentially occurring special-status plants shall include all special-status taxa known from comparable habitats in the central portion of the Mojave Desert in California. At a minimum, ~~T~~the list shall include all summer or fall-flowering species identified as potentially occurring on the site in the applicant's spring 2010 botanical survey report (TS 2010i) and by Andre (2010, Intervenor Defenders of Wildlife Rebuttal Testimony). Determination of flowering season shall be based upon field visits to reference populations and data available online from the Consortium of California Herbaria and California Native Plant Society. Target species also shall include taxa with bloom seasons that begin in fall and extend into the early spring as many of these are reported to be easier to detect in fall, following the start of the fall rains.

4. Survey Coverage. At a minimum, the Applicant shall conduct comprehensive surveys (i.e., 100 percent visual coverage) of the washes, dune swales, and other lowlands within the project site. In the intervening uplands (e.g., bajadas and rock outcrops) surveys shall be conducted to ensure a 25 percent visual coverage. Other special or unique habitats associated with rare plants (such as dunes, washes, and chenopod scrubs) shall also be surveyed at 100 percent visual coverage. Transects shall be "intuitive controlled" (per BLM 2009b) to ensure a focus on habitat most likely to support rare plants (such as desert washes or dunes), rather than on pre-defined, evenly-spaced survey grids.

5. Documenting Occurrences. If a special-status plant is detected, the full extent of the population ~~shall be assessed, both~~ onsite shall be recorded using GPS in accordance with BLM survey protocols. Additionally, the extent and density of the occupied habitat within one mile of project boundaries shall be assessed at least qualitatively to facilitate an accurate estimation of the proportion of the occurrence affected by the project. For occurrences that are very dense or very large, the plant numbers may be estimated by simple sampling techniques and the survey report must provide qualitative or quantitative data describing the density and roughly mapping the extent on a topographic map. ~~and offsite. The number of individuals shall be counted (or sub-sampled and the population size estimated in the event of large populations). The boundaries of all occurrences shall be recorded with hand-held GPS units of one meter or better accuracy and then plotted on aerial photo base maps of a scale~~

~~similar to that used in the AFC (SES 2008).~~ All but the smallest populations (e.g., a population occupying less than 100 square feet) shall be recorded as area polygons; small populations may be recorded as point features. All GPS-recorded occurrences shall include: the number of plants, phenology, observed threats (e.g., OHV or invasive exotics), and habitat or community type. The map of occurrences, to be submitted with the ~~progress reports and~~ final botanical report, shall be prepared to ensure consistency with mapping protocol and definitions of occurrences in CNDDB: occurrences found within 0.25 miles of another occurrence of the same taxon, and not separated by significant habitat discontinuities, shall be combined into a single 'occurrence.' The Project Owner shall also submit the raw GPS shape files and metadata, and completed CNDDB forms to CNDDB for each occurrence as defined by CNDDB.

6. Reporting. ~~Progress Reports shall be submitted during surveys (as described below in verification), and shall include: a) the raw GPS data and metadata; b) a spreadsheet of the data (from the 'dbf' file), and c) a map of the data showing occurrence locations (labeled with their corresponding occurrence number from the GPS files) and Project features on a USGS topographic base map.~~ Raw GPS data, metadata, and CNDDB field forms shall be provided to the CPM within two weeks of completion of each survey. If field surveys take place during two or more phases (e.g., late summer and fall), then a summary letter shall be submitted following each survey.

   The Final Summer-Fall Botanical Survey Report shall be prepared consistent with CDFG guidelines (CDFG 2009), and BLM guidelines (~~Lund pers. comm.~~2009) and shall include the following components:

   a. the BLM designation, NatureServe Global and State Rank of each species or taxon found (or proposed rank, or CNPS List);

   b. the number or percent of the occurrence that will be directly affected, and indirectly affected by changes in drainage patterns or altered geomorphic processes;

   c. the habitat or plant community that supports the occurrence and the total acres of that habitat or community type that occurs in the Project Disturbance Area;

   d. an indication of whether the occurrence has any local or regional significance (e.g., if it exhibits any unusual morphology, occurs at the periphery of its range in California, represents a significant range extension or disjunct occurrence, or occurs in an atypical habitat or substrate);

e. a completed CNDDB field form for every occurrence (i.e., the summed locations of a given species within 0.25 mile distance of another location, consistent with CNDDB methodology), and;

f. two maps: one that depicts the raw GPS data (as collected in the field) on a topographic base map with Project features; and a second map that follows the CNDDB protocol for occurrence mapping, which lumps two or more occurrences of the same species within one-quarter mile or less of each other into one occurrence.

SECTION C: ~~AVOIDANCE~~ MITIGATION REQUIREMENTS FOR SPECIAL-STATUS PLANTS DETECTED IN THE SUMMER/FALL 2010 SURVEYS

The Project owner shall apply the following avoidance standards to special-status plants that might be detected during late summer/fall season surveys. Avoidance and/or the mitigation measures described in Section D below would reduce impacts to special-status plant species to less than significant levels.

Mitigation for CNDDB Rank S1 and S2 Plants~~(Critically Imperiled) - 75% Avoidance Required~~: If species with a CNDDB rank of S1 (CDFG 2010b), excluding small-flowered androstephium (CNDDB S1.2), are detected within the Project Disturbance Area or ~~are otherwise~~ would be directly impacted by discharges from or the diversion of streams around the Project, the Project owner shall implement avoidance measures to protect at least 75 percent of the local occurrence(s) ~~population~~ of the~~is~~ species. For perennial species, ~~T~~the local occurrence(s) ~~population~~ shall be measured by the number of individual plants located ~~occurring~~ on the Project site or on public lands contiguous to the project site. ~~and within~~ For annual species, the occurrence(s) shall be measured as areal extent of contiguous occupied habitat on the site and on contiguous public lands. ~~the immediate watershed of the project for wash-dependent species or species of unknown dispersal mechanism, or the within the local sand transport corridor for wind-dispersed species.~~ Avoidance shall include protection of the ecosystem processes essential for maintenance of the protected plant occurrence. Plants located within the ESAs established pursuant to Section A above shall be considered to be "avoided" to the extent that direct impacts on the plants are avoided and that these processes would be maintained. If special status plant occurrences are isolated ~~'islands' of protected plants disconnected~~ by the Project from natural fluvial, ~~or~~ aeolian, or other processes known to be necessary for their persistence or reproduction, these occurrences shall not be considered "avoided." This evaluation shall be made in consultation among the project Botanist and the CPM, in consultation with CDFG and BLM, on a case by case basis, dependent on the species and its location on the site. ~~shall not be considered to be protected and shall not be credited as contributing to the~~

~~75% avoidance requirement because such isolated populations are not sustainable.~~ The Project owner shall provide compensatory mitigation as described below in Section D for Project impacts to CNDDB Rank S1 and S2 plants ~~(impacts cannot exceed 25 percent of the local population)~~ that ~~could not be~~ are not avoided. If, after consultation among the project Botanist, CPM, CDFG, and BLM, on-site avoidance is determined not to satisfy the long-term viability of the plant occurrence(s), then compensatory mitigation would be allowed for up to 100% of impacts to Rank S1 and S2 plants on the site, as described below in Section D.

Mitigation for CNDDB Rank 2 Plants (Imperiled) – 75% Avoidance Where Feasible: ~~If species with a CNDDB rank of 2 are detected within the Project Disturbance Area, the Project owner shall implement avoidance measures where feasible to protect 75 percent of the local population of this species. Avoidance is feasible if avoidance results in 10 percent or less loss of electrical output. The Project owner shall provide compensatory mitigation as described below in Section D for impacts to plants that could not be avoided.~~

Mitigation for CNDDB Rank S3 Plants~~(Vulnerable) – No On-Site Avoidance Required Unless Local or Regional Significance~~: If species with a CNDDB rank of 3 are detected within the Project Disturbance Area, no onsite avoidance or compensatory mitigation shall be required unless the occurrence has local or regional significance, in which case the plant occurrence shall be treated as a CNDDB 2 ranked plant. A plant occurrence would be considered to have local or regional significance if:

a. It occurs at the outermost periphery of its range in California;

b. It occurs in an atypical habitat, region, or elevation for the taxon that suggests that the occurrence may have genetic significance (e.g., that may increase its ability to survive future threats), or;

c. It exhibits any unusual morphology that is not clearly attributable to environmental factors that may indicate a potential new variety or sub-species.

Should CNDDB Rank S3 plant locations meeting any of the three criteria above be found on the project site during summer or fall field surveys, then mitigation requirements for those species shall be as described above for CNDDB Rank S1 and S2 species.

Pre-Construction Notification for State- or Federal-Listed Species, or BLM Sensitive Species. If a state or federal-listed species or BLM Sensitive species is detected, the Project owner shall immediately notify the CDFG, USFWS, BLM, and the CPM.

Preservation of the Germplasm of Affected Special-Status Plants. For all ~~significant~~impacts to CNPS List 1 or List 2 ~~special-status~~ plants, excluding small-flowered androstephium, ~~regardless of whether compensatory mitigation is required,~~ mitigation shall include seed collection from the affected special-status plants on-site prior to construction to conserve the germplasm and provide a seed source for restoration efforts. Seed collection must only be done under permit from the BLM; the project owner shall be responsible for obtaining and complying with applicable permit(s). The seed shall be collected under the supervision or guidance of a reputable seed storage facility such as the Rancho Santa Ana Botanical Garden Seed Conservation Program, San Diego Natural History Museum, or the Missouri Botanical Garden. The costs associated with the long-term storage of the seed shall be the responsibility of the Project owner. Any efforts to propagate and reintroduce special-status plants from seeds in the wild shall be carried out under the direct supervision of specialists such as those listed above and as part of a Habitat Restoration/Enhancement Plan approved by the CPM.

SECTION D: OFF-SITE COMPENSATORY MITIGATION FOR SPECIAL-STATUS PLANTS

Where compensatory mitigation is required under the terms of Section C, above, the Project owner shall mitigate Project impacts to CNPS List 1 or List 2 ~~special-status~~ plants, excluding small-flowered androstephium ~~occurrences~~with compensatory mitigation. Compensatory mitigation shall consist of acquisition of habitat supporting the target species, restoration/enhancement of populations of the target species, or a combination of acquisition and restoration/enhancement as provided within this Condition. Compensatory mitigation shall be at a 3:1 ratio. For annual species, compensation shall provide ~~, with~~ three acres of habitat acquired or restored/enhanced for every acre of special-status plant habitat disturbed by the Project Disturbance Area. For perennial species, compensation lands shall supporting three living plants of the same species for each plant disturbed within the project area. The Project owner shall provide funding for the acquisition and/or restoration/enhancement, initial improvement, and long-term maintenance and management of the acquired or restored lands. The actual costs to comply with this condition will vary depending on the Project Disturbance Area, the actual costs of acquiring compensation habitat, the actual costs of initially improving the habitat, the actual costs of long-term management as determined by a Property Analysis Record (PAR) or PAR-like analysis ~~report~~, and other transactional costs related to the use of compensatory mitigation.

The Project owner shall comply with other related requirements in this condition:

I. Compensatory Mitigation by Acquisition: The requirements for the acquisition, initial protection and habitat improvement, and long-term maintenance and management of special-status plant compensation lands include all of the following:

Selection Criteria for Acquisition Lands. The compensation lands selected for acquisition may include any of the following three categories:

1. Occupied Habitat, No Habitat Threats: The compensation lands selected for acquisition shall be occupied by the target plant ~~population~~species and shall be characterized by site integrity and habitat quality that are required to support the target species, and shall be of equal or better habitat quality than that of the affected occurrence. ~~The occurrence of the target special-status plant on the proposed acquisition lands should be viable, stable or increasing (in size and reproduction).~~

2. Occupied Habitat, Habitat Threats. Occupied compensation lands characterized by habitat threats may also be acquired as long as the population could be reasonably expected to recover with minor restoration (e.g., OHV or grazing exclusion, pest plant removal) and is accompanied by a Habitat Enhancement/Restoration Plan as described in Section D.II, below.

3. Unoccupied but Adjacent. The Project owner may also acquire habitat for which occupancy by the target species has not been documented, if the proposed acquisition lands are adjacent to occupied habitat. The Project owner shall provide evidence that acquisitions of such unoccupied lands would improve the defensibility and long-term sustainability of the occupied habitat by providing a protective buffer around the occurrence and by enhancing connectivity with undisturbed habitat.

Review and Approval of Compensation Lands Prior to Acquisition. The Project owner shall submit a formal acquisition proposal to the CPM describing the parcel(s) intended for purchase. This acquisition proposal shall discuss the suitability of the proposed parcel(s) as compensation lands for special-status plants in relation to the criteria listed above, and must be approved by the CPM.

Management Plan. The Project owner or approved third party shall prepare a management plan for the compensation lands in consultation with the entity that will be managing the lands. The goal of the management plan shall be to support and enhance the long-term viability of the target special-status plant occurrences. The Management Plan shall be submitted for review and approval to the CPM.

Integrating Special-Status Plant Mitigation with Other Mitigation lands. If all or any portion of the acquired Desert Tortoise, Waters of the State, or other required compensation lands meets the criteria above for special-status plant compensation lands, the portion of the other species' or habitat compensation lands that meets any of the criteria above may be used to fulfill that portion of the obligation for special-status plant mitigation.

Compensation Lands Acquisition Requirements. The Project owner shall comply with the following requirements relating to acquisition of the compensation lands after the CPM, has approved the proposed compensation lands:

a. Preliminary Report. The Project owner, or an approved third party, shall provide a recent preliminary title report, initial hazardous materials survey report, biological analysis, and other necessary or requested documents for the proposed compensation land to the CPM. All documents conveying or conserving compensation lands and all conditions of title are subject to review and approval by the CPM. For conveyances to the State, approval may also be required from the California Department of General Services, the Fish and Game Commission and the Wildlife Conservation Board.

b. Title/Conveyance. The Project owner shall acquire and transfer fee title to the compensation lands, a conservation easement over the lands, or both fee title and conservation easement, as required by the CPM. Any transfer of a conservation easement or fee title must be to CDFG, a non-profit organization qualified to hold title to and manage compensation lands (pursuant to California Government Code section 65965), or to BLM or other public agency approved by the CPM. If an approved non-profit organization holds fee title to the compensation lands, a conservation easement shall be recorded in favor of CDFG or another entity approved by the CPM. If an entity other than CDFG holds a conservation easement over the compensation lands, the CPM may require that CDFG or another entity approved by the CPM, in consultation with CDFG, be named a third party beneficiary of the conservation easement. The Project owner shall obtain approval of the CPM of the terms of any transfer of fee title or conservation easement to the compensation lands.

c. Initial Protection and Habitat Improvement. The Project owner shall fund activities that the CPM requires for the initial protection and habitat improvement of the compensation lands. These activities will vary depending on the condition and location of the land acquired, but may include trash removal, construction and repair of fences, invasive plant removal, and similar measures to protect habitat and improve habitat quality on the compensation lands. The costs of these activities are estimated to be $750 per acre ($250 per acre, using the estimated cost per acre for Desert Tortoise mitigation as a best available proxy, at a 3:1 ratio, but actual costs will vary depending on the measures that are required for the

compensation lands). A non-profit organization, CDFG or another public agency may hold and expend the habitat improvement funds if it is qualified to manage the compensation lands (pursuant to California Government Code section 65965), if it meets the approval of the CPM in consultation with CDFG, and if it is authorized to participate in implementing the required activities on the compensation lands. If CDFG takes fee title to the compensation lands, the habitat improvement fund must be paid to CDFG or its designee.

d. Property Analysis Record. Upon identification of the compensation lands, the Project owner shall conduct a Property Analysis Record (PAR) or PAR-like analysis to establish the appropriate amount of the long-term maintenance and management fund to pay the in-perpetuity management of the compensation lands. The PAR or PAR-like analysis must be approved by the CPM before it can be used to establish funding levels or management activities for the compensation lands.

e. Long-term Maintenance and Management Funding. The Project owner shall provide money to establish an account with non-wasting capital that will be used to fund the long-term maintenance and management of the compensation lands. The amount of money to be paid will be determined through an approved PAR or PAR-like analysis conducted for the compensation lands. Until an approved PAR or PAR-like analysis is conducted for the compensation lands, the amount of required funding is initially estimated to be $4,350 for every acre of compensation lands, using as the best available proxy the estimated cost of $1,450 per acre for Desert Tortoise compensatory mitigation, at a 3:1 ratio. If compensation lands will not be identified and a PAR or PAR-like analysis completed within the time period specified for this payment (see the verification section at the end of this condition), the Project owner shall either: (i) provide initial payment equal to the amount of $4,350 multiplied by the number of acres the Project owner proposes to acquire for compensatory mitigation; or (ii) provide security to the Energy Commission under subsection (g), “Mitigation Security,” below, in an amount equal to $4,350 multiplied by the number of acres the Project owner proposes to acquire for compensatory mitigation. The amount of the required initial payment or security for this item shall be adjusted for any change in the Project Disturbance Area as described above. If an initial payment is made based on the estimated per-acre costs, the Project owner shall deposit additional money as may

be needed to provide the full amount of long-term maintenance and management funding indicated by a PAR or PAR-like analysis, once the analysis is completed and approved. If the approved analysis indicates less than $4,350 per acquired acre (at a 3:1 ratio) will be required for long-term maintenance and management, the excess paid will be returned to the Project owner. The Project owner must obtain the CPM's approval of the entity that will receive and hold the long-term maintenance and management fund for the compensation lands. The CPM will consult with CDFG before deciding whether to approve an entity to hold the Project's long-term maintenance and management funds.

The Project owner shall ensure that an agreement is in place with the long-term maintenance and management fund holder/manager to ensure the following requirements are met:

i. Interest. Interest generated from the initial capital long-term maintenance and management fund shall be available for reinvestment into the principal and for the long-term operation, management, and protection of the approved compensation lands, including reasonable administrative overhead, biological monitoring, improvements to carrying capacity, law enforcement measures, and any other action that is approved by the CPM and is designed to protect or improve the habitat values of the compensation lands.

ii. Withdrawal of Principal. The long-term maintenance and management fund principal shall not be drawn upon unless such withdrawal is deemed necessary by the CPM or by the approved third-party long-term maintenance and management fund manager, to ensure the continued viability of the species on the compensation lands.

iii. Pooling Long-Term Maintenance and Management Funds. An entity approved to hold long-term maintenance and management funds for the Project may pool those funds with similar non-wasting funds that it holds from other projects for long-term maintenance and management of compensation lands for special-status plants. However, for reporting purposes, the long-term maintenance and management funds for this Project must be tracked and reported individually to the CPM.

f. Other Expenses. In addition to the costs listed above, the Project owner shall be responsible for all other costs related to

acquisition of compensation lands and conservation easements, including but not limited to the title and document review costs incurred from other state agency reviews, overhead related to providing compensation lands to CDFG or an approved third party, escrow fees or costs, environmental contaminants clearance, and other site cleanup measures.

g. Mitigation Security. The Project owner shall provide financial assurances to the CPM to guarantee that an adequate level of funding is available to implement any of the mitigation measures required by this condition that are not completed prior to the start of ground-disturbing Project activities. Financial assurances shall be provided to the CPM in the form of an irrevocable letter of credit, a pledged savings account or another form of security ("Security") approved by the CPM. The amount of the Security shall be $10,503~~9~~ per acre of occupied habitat impacted ($3,501~~3~~ per acre, using the estimated cost per acre for Desert Tortoise mitigation as a best available proxy, at a 3:1 ratio; see **Biological Resources Tables 5** and **7**) for every acre of habitat supporting the target special-status plant species which is significantly impacted by the project. The actual costs to comply with this condition will vary depending on the actual costs of acquiring compensation habitat, the costs of initially improving the habitat, and the actual costs of long-term management as determined by a PAR or PAR-like anslysis.~~report.~~ Prior to submitting the Security to the CPM, the Project owner shall obtain the CPM's approval of the form of the Security. The CPM may draw on the Security if the CPM determines the Project owner has failed to comply with the requirements specified in this condition. The CPM may use money from the Security solely for implementation of the requirements of this condition. The CPM's use of the Security to implement measures in this condition may not fully satisfy the Project owner's obligations under this condition, and the Project owner remains responsible for satisfying the obligations under this condition if the Security is insufficient. The unused Security shall be returned to the Project owner in whole or in part upon successful completion of the associated requirements in this condition.

h. The Project owner may elect to comply with the requirements in this condition for acquisition of compensation lands, initial protection and habitat improvement on the compensation lands, or long-term maintenance and management of the compensation lands by funding, or any combination of these

three requirements, by providing funds to implement those measures into the Renewable Energy Action Team (REAT) Account established with the National Fish and Wildlife Foundation (NFWF). To use this option, the Project owner must make an initial deposit to the REAT Account in an amount equal to the estimated costs (as set forth in the Security section of this condition) of implementing the requirement. If the actual cost of the acquisition, initial protection and habitat improvements, or long-term funding is more than the estimated amount initially paid by the Project owner, the Project owner shall make an additional deposit into the REAT Account sufficient to cover the actual acquisition costs, the actual costs of initial protection and habitat improvement on the compensation lands, and the long-term funding requirements as established in an approved PAR or PAR-like analysis. If those actual costs or PAR projections are less than the amount initially transferred by the applicant, the remaining balance shall be returned to the Project owner.

i. The responsibility for acquisition of compensation lands may be delegated to a third party other than NFWF, such as a non-governmental organization supportive of desert habitat conservation, by written agreement of the Energy Commission. Such delegation shall be subject to approval by the CPM, in consultation with CDFG, BLM and USFWS, prior to land acquisition, enhancement or management activities. Agreements to delegate land acquisition to an approved third party, or to manage compensation lands, shall be executed and implemented within 18 months of the Energy Commission's certification of the Project.

II. Compensatory Mitigation by Habitat Enhancement/Restoration: As an alternative or adjunct to land acquisition for compensatory mitigation the Project owner may undertake habitat enhancement or restoration for the target special-status plant species. Habitat enhancement or restoration activities must achieve protection at a 3:1 ratio as described above, with improvements applied to three acres of habitat for every acre of special-status plant habitat directly or indirectly disturbed by the Project Disturbance Area for annual species; or to habitat supporting three living plants for each individual perennial plant directly or indirectly disturbed by the project. Examples of suitable enhancement projects include but are not limited to the following: i) control unauthorized vehicle use into an occurrence (or pedestrian use if clearly damaging to the species); ii) control noxious weeds that infest or pose an immediate threat to an occurrence; iii) exclude grazing by wild burros or livestock from an occurrence; or iv) restore lost or degraded hydrologic or geomorphic functions critical to the species by restoring previously diverted flows,

removing obstructions to the wind sand transport corridor above an occurrence, or increasing groundwater availability for dependent species.

If the Project owner elects to undertake a habitat enhancement project for mitigation, the project must meet the following performance standards: The proposed enhancement project shall achieve rescue of an off-site occurrence that is currently assessed, based on the NatureServe threat ranking system (Master et al. 2009; Morse et al. 2004) with one of the following threat ranks: a) long-term decline >30%; b) an immediate threat that affects >30% of the population, or c) has an overall threat impact that is High to Very High. “Rescue” would be considered successful if it achieves an improvement in the occurrence trend to “stable” or “increasing” status, or downgrading of the overall threat rank to slight or low (from “High” to “Very High”).

If the Project owner elects to undertake a habitat enhancement project for mitigation, they shall submit a Habitat Enhancement/Restoration Plan to the CPM for review and approval, and shall provide sufficient funding for implementation and monitoring of the Plan. The amount of the Security shall be $10,503~~3~~9 per acre of occupied habitat impacted by the project ($3,501~~4~~3 per acre, using the estimated cost per acre for Desert Tortoise mitigation as a best available proxy, at a 3:1 ratio)~~for every acre of habitat supporting the target special-status plant species which is directly or indirectly impacted by the project~~. The amount of the security may be adjusted based on the actual costs of implementing the enhancement, restoration and monitoring. The implementation and monitoring of the enhancement/restoration may be undertaken by an appropriate third party such as NFWF, subject to approval by the CPM. The Habitat Enhancement/Restoration Plan shall include each of the following:

1. Goals and Objectives. Define the goals of the restoration or enhancement project and a measurable course of action developed to achieve those goals. The objective of the proposed habitat enhancement plan shall include restoration of a target special-status plant occurrence that is currently threatened with a long-term decline. The proposed enhancement plan shall achieve an improvement in the occurrence trend to “stable” or “increasing” status, or downgrading of the overall threat rank to slight or low (from “High” to “Very High”).

2. Historical Conditions. Provide a description of the pre-impact or historical conditions (before the site was degraded by weeds or grazing or ORV, etc.), and the desired conditions.

3. Site Characteristics. Describe other site characteristics relevant to the restoration or enhancement project (e.g., composition of native and pest plants, topography and drainage patterns, soil types, geomorphic and hydrologic processes important to the site or species.

4. Ecological Factors. Describe other important ecological factors of the species being protected, restored, or enhanced such as total population, reproduction, distribution, pollinators, etc.

5. Methods. Describe the restoration methods that will be used (e.g., invasive exotics control, site protection, seedling protection, propagation techniques, etc.) and the long-term maintenance required. The implementation phase of the enhancement must be completed within five years.

6. Budget. Provide a detailed budget and timeline; develop clear, measurable, objective-driven annual success criteria.

7. Monitoring. Develop clear, measurable monitoring methods that can be used to evaluate the effectiveness of the restoration and the benefit to the affected species. The Plan shall include a minimum of five years of quarterly monitoring, and then annual monitoring for the remainder of the enhancement project, and until the performance standards for rescue of a threatened occurrence are met. At a minimum the progress reports shall include: quantitative measurements of the projects progress in meeting the enhancement project success criteria, detailed description of remedial actions taken or proposed, and contact information for the responsible parties.

8. Reporting Program. The Plan shall ensure accountability with a reporting program that includes progress toward goals and success criteria. Include names of responsible parties.

9. Contingency Plan. Describe the contingency plan for failure to meet annual goals.

10. Long-term Protection. Include proof of long-term protection for the restoration site. For private lands this would include conservations easements or other deed restrictions; projects on public lands must be contained in a Desert Wildlife Management Area, Wildlife Habitat Management Area, or other land use protections that will protect the mitigation site and target species.

SECTION E: CONFORMANCE WITH BLM AND SAN BERNARDINO COUNTY PLANT PROTECTION POLICIES

It is BLM policy to salvage yucca and cactus plants (excluding cholla species, genus *Cylindropuntia*) and transplant them to undisturbed sites within project Rights of Way. The San Bernardino County Plant Protection and Management Ordinance regulates the following where they occur on non-government land (San Bernardino County Code 88.01): desert native plants with stems 2 inches or greater in diameter or 6 feet or greater in height: *Psorothamnus* [*Dalea*] *spinosa* (smoke tree), *Prosopis* spp. (mesquites), all species of the family Agavaceae (century plants, nolinas, yuccas), creosote rings 10 feet or greater in diameter, all Joshua trees; and any part of any of the

following species, whether living or dead: *Olneya tesota* (desert ironwood), all species of the genus *Prosopis* (mesquites), and all species of the genus *Cercidium* (palo verdes). Staff recognizes that the project site is on public land and thus not strictly subject to the County ordinance,~~. However, staff notes that the proposed project would convert the site to exclusive private use and is, in effect, a private project. Staff recommends conformance with~~ but believes the County ordinance establishes an additional mitigation standard that should be applied to the project, as follows:

a. The project owner shall inventory all plants subject to BLM and County policies on the project site that would be removed or damaged by proposed project construction.

b. The project owner shall include salvaged plants or potted nursery stock of any species named in BLM or County policies in on-site revegetation planning and implementation, as described in **BIO-10**. The project owner shall include ~~prepare a~~ Protected Plant Salvage and Replacement ~~Plan~~Section in the Revegetation Plan, in conformance with BLM. The Section also shall provide for incorporation of salvaged or potted stock of any species identified in the ~~and~~San Bernardino County standards that would be impacted by project development affected. The Section shall be made available for review and approval by the CPM. ~~The plan~~For salvaged plants, the Section shall include detailed descriptions of proposed methods to salvage plants; transport them; store them temporarily (as needed); and maintain them in temporary storage (i.e., irrigation, shade protection, etc.).~~;~~ For both salvaged plants and potted nursery stock, the Section shall include detailed descriptions of proposed planting ~~transplantation~~ locations and methods ~~for permanent relocation~~; proposed irrigation and maintenance methods at ~~transplantation~~ planting sites; and a monitoring plan to verify survivorship and establishment of ~~translocated~~ the plants for a minimum of five years.

c. Concurrent with ~~Prior to initiating~~ any ground-disturbing activities within any phase of the project, ~~on the project site,~~ the project owner shall implement the Protected Plant Replacement measures as approved by the CPM and BLM's State Botanist~~, and the County~~.

Verification: The Special-Status Plant Impact Avoidance and Minimization Measures shall be incorporated into the BRMIMP as required under Condition of Certification **BIO-7**.

Implementation of the special-status plant impact avoidance and minimization measures shall be reported in the Monthly Compliance Reports prepared by the Designated Botanist. Within 30 days after completion of Project construction, the Project owner shall provide to the CPM, for review and approval in consultation with the BLM State Botanist, a written construction termination report identifying how measures have been completed.

The Project owner shall submit a monitoring report every year for the life of the project to monitor effectiveness of protection measures for all avoided special-status plants to the CPM and BLM State Botanist. The monitoring report shall include: dates of worker awareness training sessions and attendees, an inventory of the special-status plant occurrences and description of the habitat conditions, an indication of population and habitat quality trends, and description of the remedial action, if warranted and planned for the upcoming year.

Section A. No less than 30 days prior to the start of ground-disturbing activities the Project owner shall submit grading plans and construction drawings depicting the location of Environmentally Sensitive Areas and the Avoidance and Minimization Measures contained in Section A of this Condition. The project owner shall coordinate with the CPM and BLM's Wildlife Biologist to revise and finalize boundaries of the ESAs. The 30 day limit may be reduced by the CPM.

No less than 30 days prior to the start of ground-disturbing activities the Project owner shall submit to the CPM for review and approval, in consultation with the BLM State Botanist, the name and resume of the project's Designated Botanist. If a Designated Botanist needs to be replaced, the specified information of the proposed replacement must be submitted to BLM's Wildlife Biologist and the CPM as soon as possible prior to the termination or release of the Designated Biologist. In an emergency, the project owner shall immediately notify the BLM's Wildlife Biologist and the CPM to discuss the qualifications and approval of a short-term replacement while a permanent Designated Botanist is proposed to BLM's Wildlife Biologist and the CPM and for consideration. The 30 day limit may be reduced by the CPM.

No less than 30 days prior to ground-disturbing activities the Project owner shall submit a draft White-margined Beardtongue Impact Avoidance and Minimization Plan to the CPM for review and approval, in consultation with the BLM State Botanist. Implementation of the white-margined beardtongue impact avoidance and minimization measures shall be reported in the Monthly Compliance Reports prepared by the Designated Botanist. Within 30 days after completion of Project construction, the Project owner shall provide to the CPM, for review and approval in consultation with the BLM State Botanist, a written construction termination report identifying how measures have been completed. The 30 day limit may be reduced by the CPM.

The Project owner shall submit a monitoring report every year for the life of the project to monitor effectiveness of protection measures for all avoided white-margined beardtongue ESAs to the CPM and BLM State Botanist. The monitoring report shall include: dates of worker awareness training sessions and attendees, an inventory of the special-status plant occurrences and description of the habitat conditions, an indication of population and habitat quality trends, and description of the remedial action, if warranted and planned for the upcoming year. The project owner shall coordinate with the CPM and BLM's Wildlife Biologist to revise and finalize monitoring reports and all

reports described in this section, and shall specifically report any difficulties in meeting the protection goals and cooperatively develop adaptive measures as needed.

Section B. Raw GPS data, metadata, and CNDDB field forms shall be submitted to the CPM within two weeks of the completion of each survey. A preliminary summary of results for the late summer/fall botanical surveys shall also be submitted to the CPM and BLM's State Botanist within two weeks following the completion of the surveys. If surveys are split into more than one period, then a summary letter shall be submitted following each survey period. The Final Summer-Fall Botanical Survey Report, GIS shape files and metadata shall be submitted to the BLM State Botanist and the CPM no less than 30 days prior to the start of ground-disturbing activities. The Final Report shall include a detailed accounting of the acreage of Project impacts to special-status plant occurrences.

Section C. The Project owner shall immediately provide written notification to the CPM, CDFG, USFWS, and BLM if it detects a State- or Federal-Listed Species, or BLM Sensitive Species at any time during its late summer/fall botanical surveys or at any time thereafter through the life of the Project, including conclusion of Project decommissioning.

Prior to construction, the project owner shall provide verification that seed of any special status plants on the project site have collected and conveyed to a facility (as described in this measure) and that suitable long-term funding has been provided by the project owner.

Section D. If compensatory mitigation is required (based upon field survey results and mitigation strategy adopted by the project owner, as described in Sections C and D), no less than 30 days prior to the start of ground-disturbing activities, the Project owner shall submit to the CPM Security adequate to acquire compensatory mitigation lands and/or undertake habitat enhancement or restoration activities, as described in this condition. The 30 day limit may be reduced by the CPM.

No fewer than 90 days prior to acquisition of compensatory mitigation lands, the Project owner shall submit a formal acquisition proposal and draft Management Plan for the proposed lands to the CPM, with copies to CDFG, USFWS, and BLM, describing the parcels intended for purchase and shall obtain approval from the CPM prior to the acquisition. No fewer than 90 days prior to acquisition of compensatory mitigation lands, the Project owner shall submit to the CPM and obtain CPM approval of any agreements to delegate land acquisition to an approved third party, or to manage compensation lands; such agreement shall be executed and implemented within 18 months of the Energy Commission's certification of the Project.

The Project owner or an approved third party shall complete the acquisition and all required transfers of the compensation lands, and provide written verification to the

CPM of such completion no later than 18 months after the start of Project ground-disturbing activities. If NFWF or another approved third party is being used for the acquisition, the Project owner shall ensure that funds needed to accomplish the acquisition are transferred in timely manner to facilitate the planned acquisition and to ensure the land can be acquired and transferred prior to the 18-month deadline. If habitat enhancement is proposed, no later than six months following the start of ground-disturbing activities, the Project owner shall obtain CPM approval of the final Habitat Enhancement/Restoration Plan, prepared in accordance with Section D, and submit to the CPM or a third party approved by the CPM Security adequate for long-term implementation and monitoring of the Habitat Enhancement/Restoration Plan.

Enhancement/restoration activities shall be initiated no later than 12 months from the start of construction. The implementation phase of the enhancement project shall be completed within five years of initiation. Until completion of the five-year implementation portion of the enhancement action, a report shall be prepared and submitted as part of the Annual Compliance Report. This report shall provide, at a minimum: a summary of activities for the preceding year and a summary of activities for the following year; quantitative measurements of the Project's progress in meeting the enhancement project success criteria; detailed description of remedial actions taken or proposed; and contact information for the responsible parties.

Within 18 months of ground-disturbing activities, the Project owner shall transfer to the CPM or an approved third party the difference between the Security paid and the actual costs of (1) acquiring compensatory mitigation lands, completing initial protection and habitat improvement , and funding the long-term maintenance and management of compensatory mitigation lands; and/or (2) implementing and providing for the long-term protection and monitoring of habitat enhancement or restoration activities.

Section E. The project owner shall coordinate with the CPM and BLM's Wildlife Biologist to revise and finalize all plans and reports named in this section. Verification and reporting shall be as described in **BIO-10** and shall be included in reports described therein. Within 90 days after completion of each year of project construction, the project owner shall provide to the CPM verification of the numbers or acreage of plants covered in this Condition (i.e., species named in BLM and County policies) which have been removed or salvaged over the course of the year. Annual revegetation reports described in **BIO-10** verification shall include summaries of salvage and planting operations and monitoring results. Compliance reports shall include summaries of written and photographic records of the plan implementation described above. Compliance reports shall be submitted annually for a period not less than 5 years to document irrigation, maintenance, and monitoring results, including plant survival.

~~No more than 90 days following the publication of the Energy Commission Decision the project owner shall submit draft versions of the Protected Plant Salvage measures for review by the CPM. The project owner shall also provide a cost estimate for~~

~~implementation of the measures which shall be subject to approval by the CPM. The final measures shall be submitted for approval by the CPM within 90 days of the publication of the Commission Decision. The final measures shall be incorporated into the BRMIMP. At this time, the project owner shall also provide security sufficient to fund the implementation of the measures.~~

~~Throughout project construction, or at any phase during the project when plants covered in Section E of this Condition are to be salvaged, the Designated Biologist or Designated Botanist shall submit quarterly and annual compliance reports to the CPM, BLM wildlife biologist, , and CDFG describing all project activities pertinent to the Protected Plant Salvage measures. Compliance reports shall include summaries of written and photographic records of the plan implementation described above. Upon completion of all plant salvage and replacement, compliance reports shall be submitted annually for a period not less than 5 years to document irrigation, maintenance, and monitoring results, including plant survival. The Designated Biologist shall maintain written and photographic records of the tasks described above, and make these records available to the CPM, County, BLM State Botanist, and CDFG upon request. The project owner shall coordinate with the CPM and BLM's Wildlife Biologist to revise and finalize all plans and reports named in this section.~~

CONDITION OF CERTIFICATION BIO-15, PAGES C.2-211 TO C.2-215

DESERT TORTOISE CLEARANCE SURVEYS AND EXCLUSION FENCING

BIO-15 The project owner shall undertake appropriate measures to manage the construction site and related facilities in a manner to avoid or minimize impacts to desert tortoise. Methods for clearance surveys, fence specification and installation, tortoise handling, artificial burrow construction, egg handling and other procedures shall be consistent with those described in the USFWS' 2009 *Desert Tortoise Field Manual* <http://www.fws.gov/ventura/speciesinfo/protocols_guidelines> or more current guidance provided by CDFG and USFWS. The project owner shall also implement all terms and conditions described in the Biological Opinion for the Project prepared by USFWS. These measures include, but are not limited to, the following:

1. Desert Tortoise Exclusion Fence Installation. To avoid impacts to desert tortoises, permanent desert tortoise exclusion fencing shall be installed along the permanent perimeter security fence and temporarily installed along the utility corridors at tower locations, laydown areas, or other staging areas.Tortoise exclusion fencing shall also be installed as necessary to prevent tortoises on the southern NAP (not a part) area (between the project site and Interstate-40) to prevent tortoises from entering the highway. If the culvert areas cannot be fenced due to

restrictions associated with highway maintenance, the two tortoises would be translocated off the site (see **BIO-16**). The proposed alignments for the permanent perimeter fence and utility rights-of-way fencing shall be flagged and surveyed within 24 hours prior to the initiation of fence construction. Clearance surveys of the perimeter fence and utility rights-of-way alignments shall be conducted by the Designated Biologist(s) using techniques approved by the USFWS and CDFG and may be conducted in any season with USFWS and CDFG approval. Biological Monitors may assist the Designated Biologist under his or her supervision with the approval of the CPM, BLM, USFWS, and CDFG. These fence clearance surveys shall provide 100-percent coverage of all areas to be disturbed and an additional transect along both sides of the fence line. This fence line transect shall cover an area approximately 90 feet wide centered on the fence alignment. Transects shall be no greater than 15 feet apart. All desert tortoise burrows, and burrows constructed by other species that might be used by desert tortoises, shall be examined to assess occupancy of each burrow by desert tortoises and handled in accordance with the USFWS' 2009 *Desert Tortoise Field Manual*. Any desert tortoise located during fence clearance surveys shall be handled by the Designated Biologist(s) in accordance with the USFWS' 2009 *Desert Tortoise Field Manual*.

a. Timing, Supervision of Fence Installation. The exclusion fencing shall be installed prior to the onset of site clearing and grubbing. Fencing shall also be placed along both sides of any construction access roads within tortoise habitat but outside the fenced construction area, and maintained throughout the construction phase of the project, unless otherwise approved by the CPM, BLM Wildlife Biologist, USFWS, and CDFG. The fence installation shall be supervised by the Designated Biologist and monitored by the Biological Monitors to ensure the safety of any tortoise present.

b. Fence Material and Installation. The permanent tortoise exclusionary fencing shall be constructed in accordance with the USFWS' 2009 *Desert Tortoise Field Manual* (Chapter 8 – Desert Tortoise Exclusion Fence).

c. Security Gates. Security gates shall be designed with minimal ground clearance to deter ingress by tortoises. The gates may be electronically activated to open and close immediately after the vehicle(s) have entered or exited to prevent the gates from being kept open for long periods of time. Cattle grating designed to safely exclude desert tortoise shall be installed at the gated entries to discourage tortoises from gaining entry

d. Fence Inspections. Following installation of the desert tortoise exclusion fencing for both the permanent site fencing and temporary

fencing in the utility corridors, the fencing shall be regularly inspected. If tortoise were moved out of harm's way during fence construction, permanent and temporary fencing shall be inspected at least two times a day for the first 7 days to ensure a recently moved tortoise has not been trapped within the fence. Thereafter, permanent fencing shall be inspected monthly and during and within 24 hours following all major rainfall events. A major rainfall event is defined as one for which surface flow is detectable within the fenced drainage during the storm, or for which channels on-site show any evidence of newly deposited sediments, bank erosion, or channel reworking following the storm. The project owner shall be responsible for monitoring storm flows and changes to channels to evaluate need for fence inspection. Any damage to the fencing shall be temporarily repaired immediately to keep tortoises out of the site, and permanently repaired within 48 hours of observing damage. Inspections of permanent site fencing shall occur for the life of the project. Temporary fencing shall be inspected weekly and, where drainages intersect the fencing, during and within 24 hours following major rainfall events. All temporary fencing shall be repaired immediately upon discovery and, if the fence may have permitted tortoise entry while damaged, the Designated Biologist shall inspect the area for tortoise.

2. Desert Tortoise Clearance Surveys within the Plant Site. Following construction of the permanent perimeter security fence and the attached tortoise exclusion fence, the permanently fenced power plant site shall be cleared of tortoises by the Designated Biologist, who may be assisted by the Biological Monitors. Clearance surveys shall be conducted in accordance with the USFWS' 2009 *Desert Tortoise Field Manual* (Chapter 6 – Clearance Survey Protocol for the Desert Tortoise – Mojave Population) and shall consist of two surveys covering 100% the project area by walking transects no more than 15-feet apart. If a desert tortoise is located on the second survey, a third survey shall be conducted. Each separate survey shall be walked in a different direction to allow opposing angles of observation. Clearance surveys of the power plant site may only be conducted when tortoises are most active (April through May or September through October). Surveys outside of these time periods require approval by USFWS and CDFG. Any tortoise located during clearance surveys of the power plant site shall be relocated and monitored in accordance with the Desert Tortoise Translocation Plan (Condition of Certification **BIO-16**).

   a. Burrow Searches. During clearance surveys all desert tortoise burrows, and burrows constructed by other species that might be used by desert tortoises, shall be examined by the Designated Biologist, who may be assisted by the Biological Monitors, to assess occupancy of each burrow by desert tortoises and handled in accordance with the USFWS' 2009 *Desert Tortoise Field Manual*. To prevent reentry by a tortoise or

other wildlife, all burrows shall be collapsed once absence has been determined. Tortoises taken from burrows and from elsewhere on the power plant site shall be translocated as described in the Desert Tortoise Translocation Plan.

b. Burrow Excavation/Handling. All potential desert tortoise burrows located during clearance surveys would be excavated by hand, tortoises removed, and collapsed or blocked to prevent occupation by desert tortoises. All desert tortoise handling and removal, and burrow excavations, including nests, would be conducted by the Designated Biologist, who may be assisted by a Biological Monitor in accordance with the USFWS' 2009 *Desert Tortoise Field Manual.*

3. Monitoring Following Clearing. Following the desert tortoise clearance and removal from the power plant site and utility corridors and initial memo or verbal completion report to BLM's Wildlife Biologist, the CPM, USFWS, and CDFG (below), workers and heavy equipment shall be allowed to enter the project site to perform clearing, grubbing, leveling, and trenching. A Designated Biologist shall monitor clearing and grading activities to find and move tortoises missed during the initial tortoise clearance survey. Should a tortoise be discovered, it shall be translocated as described in the Desert Tortoise Translocation Plan to an area approved by the Designated Biologist.

4. Reporting. The Designated Biologist shall record the following information for any desert tortoises handled: a) the locations (narrative and maps) and dates of observation; b) general condition and health, including injuries, state of healing and whether desert tortoise voided their bladders; c) location moved from and location moved to (using GPS technology); d) gender, carapace length, and diagnostic markings (i.e., identification numbers or marked lateral scutes); e) ambient temperature when handled and released; and f) digital photograph of each handled desert tortoise as described in the paragraph below. Desert tortoise moved from within project areas shall be marked and monitored in accordance with the Desert Tortoise Translocation Plan.

Verification: All mitigation measures and their implementation methods shall be included in the BRMIMP and implemented. Implementation of the measures shall be reported in the Monthly Compliance Reports by the Designated Biologist. Immediately upon completion of clearance surveys and desert tortoise removal from the site, the Designated Biologist shall provide an initial memo or verbal report of the results to BLM's Wildlife Biologist, the CPM, USFWS, and CDFG. Within 30 days after completion of desert tortoise clearance surveys the Designated Biologist shall submit a report to BLM's Wildlife Biologist, the CPM, USFWS, and CDFG describing implementation of each of the mitigation measures listed above and compliance with Gila monster clearance survey (**BIO-14**). The report shall include the desert tortoise survey results,

capture and release locations of any relocated desert tortoises, and any other information needed to demonstrate compliance with the measures described above.

CONDITION OF CERTIFICATION BIO-15, PAGES C.2-215

DESERT TORTOISE TRANSLOCATION PLAN

BIO-16 The project owner shall develop and implement a final Desert Tortoise Translocation Plan (Plan) in conformance with standards and guidelines described in *Translocation of Desert Tortoises (Mojave Population) From Project Sites: Plan Development Guidance* (USFWS 2010), any more current guidance or recommendations as available from CDFG or USFWS, and meets the approval of USFWS, CDFG, BLM's Wildlife Biologist and the CPM. The goal of the Plan shall be to safely exclude desert tortoises from within the fenced project area and translocate them to suitable habitat capable of supporting them, while minimizing stress and potential for disease transmission. Tortoises to be moved farther than 500 meters shall be tested for disease prior to translocation. The Plan shall include written correspondence with CalTrans indicating whether tortoise exclusion fencing may be installed to prevent tortoises on the southern NAP area (between the project site and Interstate-40) to prevent tortoises from entering the highway. If CalTrans does not permit that fencing, then desert tortoises shall be translocated off the NAP site (see **BIO-15**). The final Plan shall be based on the draft Desert Tortoise Translocation Plan prepared by the applicant and shall include all revisions deemed necessary by USFWS, CDFG, BLM'S Wildlife Biologist, and staff. The Plan shall include but not be limited to, a list of the authorized handlers, protocols for disease testing and assessing tortoise health, proposed translocation locations and procedures, schedule of translocations, a habitat assessment of translocation lands, monitoring and reporting, and contingency planning (e.g., handling an injured or diseased tortoise).

Verification: Within 30 days of publication of the Energy Commission License Decision or BLM's Record of Decision/ROW Issuance, whichever comes first, the project owner shall provide BLM's Wildlife Biologist and the CPM with the final version of a Desert Tortoise Translocation Plan that has been reviewed and approved by BLM's Wildlife Biologist and the CPM in consultation with USFWS and CDFG. The plan shall include the locations of the translocation sites. The project owner may not translocate more than 98 tortoises unless the project owner first provides the CPM with documentation demonstrating that adequate translocation sites have been identified, and obtains CPM approval of those translocation sites. All modifications to the approved Plan shall be made only after approval by BLM's Wildlife Biologist and the CPM, in consultation with USFWS and CDFG.

Within 30 days after initiation of translocation activities, the Designated Biologist shall provide to BLM's Wildlife Biologist and the CPM for review and approval, a written report identifying which items of the Plan have been completed, and a summary of all modifications to measures made during implementation of the Plan. Written monthly progress reports shall be provided to the BLM's Wildlife Biologist and CPM for the duration of the Plan implementation, including the duration of monitoring of translocated tortoises.

CONDITION OF CERTIFICATION BIO-19, PAGES C.2-225 TO C.2-226

PRE-CONSTRUCTION NEST SURVEYS AND IMPACT AVOIDANCE MEASURES FOR MIGRATORY BIRDS

BIO-19 Pre-construction nest surveys shall be conducted each year during the construction phase of the project if construction activities will occur during the breeding period (from January 1 through August 1). The Designated Biologist or Biological Monitor conducting the surveys shall be experienced bird surveyors who have demonstrated experience conducting nest searches; are knowledgeable of the nesting habitats of species that may nest on the site; and are familiar with standard nest-locating techniques such as those described in Martin and Guepel (1993). Surveys shall be conducted in accordance with the following guidelines. Nothing in this condition requires the project owner to conduct burrowing owl surveys by entering private lands adjacent to the project site when the project owner has made reasonable attempts to obtain permission to enter the property for survey work but was unable to obtain such permission. In this situation only, the project owner may substitute binocular surveys for protocol field surveys.

1. Surveys shall cover all potential nesting habitat in the project site and within 500 feet of the boundaries of the plant site and linear facilities;
2. At least two pre-construction 100-percent coverage surveys shall be conducted of each proposes construction area, separated by a minimum 10-day interval. One of the surveys shall be conducted within the 10 days preceding initiation of construction activity. Additional follow-up surveys may be required if periods of construction inactivity exceed one week in any given area, an interval during which birds may establish a nesting territory and initiate egg laying and incubation;
3. If active nests are detected during the survey, a 500 foot no-disturbance buffer zone shall be implemented and a monitoring plan shall be developed. This protected area surrounding the nest may be adjusted by the Designated Biologist in consultation with CDFG, BLM, USFWS, and CPM. Nest locations shall be mapped using GPS technology and the location data provided in completion reports (below) to the CPM and BLM Wildlife Biologist; and

4. The Designated Biologist shall monitor the nest until he or she determines that nestlings have fledged and dispersed. Monitoring shall avoid disturbing the nests or causing an increased risk of predation. Activities that might, in the opinion of the Designated Biologist and in consultation with the CPM and BLM, disturb nesting activities shall be prohibited within the buffer zone until such a determination is made.

Verification: Upon completion of the surveys, and prior to initiating any vegetation removal or ground-disturbing activities (i.e., no more than 10 days prior to the start of such activities), the project owner shall provide the CPM and BLM a letter-report describing the methods and findings of the pre-construction nest surveys, including the time, date, and duration of the survey; identity and qualifications of the surveyor(s); and a list of species observed. If active nests are detected during the survey, the report shall include a map or aerial photo identifying the location of the nest and shall depict the boundaries of the no-disturbance buffer zone around the nest.

CONDITION OF CERTIFICATION BIO-21, PAGES C.2-227 TO C.2-230

BURROWING OWL IMPACT AVOIDANCE AND MINIMIZATION MEASURES

BIO-21 The Project owner shall implement the following measures to avoid, minimize and offset impacts to burrowing owls. Nothing in this condition requires the project owner to conduct burrowing owl surveys by entering private lands adjacent to the project site when the project owner has made reasonable attempts to obtain permission to enter the property for survey work but was unable to obtain such permission. In this situation only, the project owner may substitute binocular surveys for protocol field surveys.

:

1. Pre-Construction Surveys. The Designated Biologist or Biological Monitor shall conduct pre-construction surveys for burrowing owls no more than 30 days prior to initiation of construction activities. Surveys shall be focused exclusively on detecting burrowing owls, and shall be conducted from two hours before sunset to one hour after or from one hour before to two hours after sunrise. The survey area shall include the Project Disturbance Area and surrounding 500 foot survey buffer.

2. Implement Avoidance Measures. If an active burrowing owl burrow is detected within 500 feet from the Project Disturbance Area the following avoidance and minimization measures shall be implemented:

   a. Establish Non-Disturbance Buffer. Fencing shall be installed at a 250-foot radius from the occupied burrow to create a non-disturbance buffer around the burrow. The non-disturbance buffer and fence line may be reduced to 160 feet if all Project-related

activities that might disturb burrowing owls would be conducted during the non-breeding season (September 1st through January 31st). Signs shall be posted in English and Spanish at the fence line indicating no entry or disturbance is permitted within the fenced buffer.

b. Monitoring: If construction activities would occur within 500 feet of the occupied burrow during the nesting season (February 1 – August 31st) the Designated Biologist or Biological Monitor shall monitor to determine if these activities have potential to adversely affect nesting efforts, and shall implement measures to minimize or avoid such disturbance.

3. Passive Relocation of Burrowing Owls. If pre-construction surveys indicate the presence of burrowing owls within the Project Disturbance Area (the Project Disturbance Area means all lands disturbed in the construction and operation of the Genesis Project), the Project owner shall prepare and implement a Burrowing Owl Relocation and Mitigation Plan, in addition to the avoidance measures described above. The final Burrowing Owl Relocation and Mitigation Plan shall be approved by the CPM, in consultation with USFWS, BLM and CDFG, and shall:

   a. Identify and describe suitable relocation sites within 1 mile of the Project Disturbance Area, and describe measures to ensure that burrow installation or improvements would not affect sensitive species habitat or existing burrowing owl colonies in the relocation area;

   b. Provide guidelines for creation or enhancement of at least two natural or artificial burrows per relocated owl, including a discussion of timing of burrow improvements, specific location of burrow installation, and burrow design. Design of the artificial burrows shall be consistent with CDFG guidelines (CDFG 1995) and shall be approved by the CPM in consultation with CDFG, BLM and USFWS;

   c. Passive relocation sites shall be in areas of suitable habitat for burrowing owl nesting, and be characterized by minimal human disturbance and access. Relative cover of non-native plants within the proposed relocation sites shall not exceed the relative cover of non-native plants in the adjacent habitats;

   d. Provide detailed methods and guidance for passive relocation of burrowing owls occurring within the Project Disturbance Area; and

4. Acquire Compensatory Mitigation Lands for Burrowing Owls. The following measures for compensatory mitigation shall apply only if burrowing owls that are detected within the Project Disturbance Area. The Project owner shall acquire, in fee or in easement, 19.5 acres of land for each burrowing owl that is displaced by construction of the Project. This compensation acreage of 19.5 acres per single bird or pair of nesting owls assumes that there is no evidence that the compensation lands are occupied by burrowing owls. If burrowing owls are observed to occupy the compensation lands, then only 9.75 acres per single bird or pair is required, per CDFG (1995) guidelines. If the compensation lands are contiguous to currently occupied habitat, then the replacement ratio will be 13.0 acres per pair or single bird. The Project owner shall provide funding for the enhancement and long-term management of these compensation lands. The acquisition and management of the compensation lands may be delegated by written agreement to CDFG or to a third party, such as a non-governmental organization dedicated to habitat conservation, subject to approval by the CPM, in consultation with CDFG and USFWS prior to land acquisition or management activities. Additional funds shall be based on the adjusted market value of compensation lands at the time of construction to acquire and manage habitat. In lieu of acquiring lands itself, the Project owner may satisfy the requirements of this condition by depositing funds into the Renewable Energy Action Team (REAT) Account established with the National Fish and Wildlife Foundation (NFWF), as described in Section 3.i. of Condition of Certification BIO-17.

   a. Criteria for Burrowing Owl Mitigation Lands. The terms and conditions of this acquisition or easement shall be as described in Paragraph 1 of **BIO-17** [Desert Tortoise Compensatory Mitigation], with the additional criteria to include: 1) the mitigation land must provide suitable habitat for burrowing owls, and 2) the acquisition lands must either currently support burrowing owls or be within dispersal distance from an active burrowing owl nesting territory (generally approximately 5 miles). The burrowing owl mitigation lands may be included with the desert tortoise mitigation lands ONLY if these two burrowing owl criteria are met. If the burrowing owl mitigation land is separate from the acquisition required for desert tortoise compensation lands, the Project owner shall fulfill the requirements described below in this condition.

   b. Security. If burrowing owl mitigation land is separate from the acreage required for desert tortoise compensation lands the Project owner or an approved third party shall complete acquisition of the proposed compensation lands prior to initiating ground-disturbing Project activities. Alternatively, financial assurance can be provided

by the Project owner to the CPM with copies of the document(s) to CDFG, BLM and the USFWS, to guarantee that an adequate level of funding is available to implement the mitigation measure described in this condition. These funds shall be used solely for implementation of the measures associated with the Project. Financial assurance can be provided to the CPM in the form of an irrevocable letter of credit, a pledged savings account or another form of security ("Security") prior to initiating ground-disturbing Project activities. Prior to submittal to the CPM, the Security shall be approved by the CPM, in consultation with CDFG, BLM and the USFWS to ensure funding. The estimated costs of enhancement and endowment (see subsection C.2.4.2, Desert Tortoise, for a discussion of the assumptions used in calculating the Security, which are based on an estimate of $3501.23 per acre to fund acquisition, enhancement, and long-term management). The final amount due will be determined by the PAR analysis conducted pursuant to **BIO-17**.

Verification: If pre-construction surveys detect burrowing owls within 500 feet of proposed construction activities, the Designated Biologist shall provide to the CPM, BLM, CDFG and USFWS documentation indicating that non-disturbance buffer fencing has been installed at least 10 days prior to the start of any construction-related ground disturbance activities. The Project owner shall report monthly to the CPM, CDFG, BLM and USFWS for the duration of construction on the implementation of burrowing owl avoidance and minimization measures. Within 30 days after completion of construction the Project owner shall provide to the CPM, BLM, CDFG and USFWS a written construction termination report identifying how mitigation measures described in the plan have been completed.

If pre-construction surveys detect burrowing owls within the Project Disturbance Area, the Project owner shall notify the CPM, BLM, CDFG and USFWS no less than 10 days of completing the surveys that a relocation of owls is necessary. The Project owner shall do all of the following if relocation of one or more burrowing owls is required:

a. Within 30 days of completion of the burrowing owl pre-construction surveys, submit to the CPM, CDFG and USFWS a Burrowing Owl Relocation and Mitigation Plan.

b. No less than 90 days prior to acquisition of the burrowing owl compensation lands, the Project owner, or an approved third party, shall submit a formal acquisition proposal to the CPM, CDFG, and USFWS describing the 39-acre parcel intended for purchase. At the same time the Project owner shall submit a PAR or PAR-like analysis for the parcels for review and approval by the CPM, CDFG and USFWS.

c. Within 90 days of the land or easement purchase, as determined by the date on the title, the Project owner shall provide the CPM with a management plan for review

and approval, in consultation with CDFG, BLM and USFWS, for the compensation lands and associated funds.

d. No later than 30 days prior to the start of construction-related ground disturbing activities, the Project owner shall provide written verification of Security in accordance with this condition of certification.

e. No later than 18 months after the start of construction-related ground disturbance activities, the Project owner shall provide written verification to the CPM, BLM, CDFG and USFWS that the compensation lands or conservation easements have been acquired and recorded in favor of the approved recipient.

f. On January 31st of each year following construction for a period of five years, the Designated Biologist shall provide a report to the CPM, USFWS, BLM and CDFG that describes the results of monitoring and management of the burrowing owl relocation area. The annual report shall provide an assessment of the status of the relocation area with respect to burrow function and weed infestation, and shall include recommendations for actions the following year for maintaining the burrows as functional burrowing owl nesting sites and minimizing the occurrence of weeds.

GEOLOGY AND PALEONTOLOGICAL RESOURCES

GEO-3 The California Department of Water Resources, Division of Safety of Dams ~~has jurisdiction over proposed and existing~~ reviews plans for all dams that impound 50 acre-feet of water or more. Embankments 6 feet high or less are excluded, regardless of storage capacity and embankments impounding less than 15 acre-feet of water are excluded, regardless of height. Any detention basin meeting the Division of Safety of Dams jurisdictional criteria for a dam shall be ~~permitted through that agency~~ approved by the CPM after review by the Division of Safety of Dams.

Verification: If final detention basin design results in no jurisdictional dams, the project owner shall submit a letter of verification from the design engineer. If one or more detention basins fall within the jurisdictional criteria of the Division of Safety of Dams, the project owner shall submit copies of the ~~permit application(s)~~ design plans to the Division of Dams Safety of Dams. Upon completion of construction of jurisdictional dams, the project owner shall submit copies of ~~acceptance documents~~ as-built drawings to the Division of Safety of Dams.

SOIL AND WATER RESOURCES

CONDITION OF CERTIFICATION SOIL&WATER-2, PAGES C.7-68 TO C.7-69

WASTE DISCHARGE REQUIREMENTS

SOIL&WATER-2 The project owner shall comply with the Waste Discharge Requirements ~~for discharge of storm water associated with construction activity that are~~ presented in **Soil and Water Appendices B**, **C**, **D** and **E** ~~and submit the appropriate compliance fee to the LRWQCB. The project owner shall develop, obtain compliance project manager (CPM) approval of, and implement a Storm Water Pollution Prevention Plan (SWPPP) for the construction of the Calico Solar site, laydown area, and all linear facilities. In addition, the project owner shall comply with the Waste Discharge Requirements regarding the monitoring and reporting associated with the operation of waste water evaporation ponds.~~

~~At least 30 days prior to site mobilization, the project owner shall submit to the CPM and LRWQCB, a copy of the construction SWPPP for review and CPM approval prior to site mobilization. The project owner shall also submit to the CPM evidence of payment to LRWQCB of the appropriate compliance fee. The project owner shall retain a copy of the SWPPP on site. The project owner shall submit to the CPM copies of all correspondence between the project owner and the LRWQCB regarding the Waste Discharge Requirements for the discharge of storm water associated with construction activity within 10 days of its receipt or submittal. The project owner shall submit copies to the CPM of all correspondence between the project owner and the LRWQCB regarding the Requirements of Waste Discharge of process water and storm water associated with industrial activity within 10 days of its receipt or submittal. Copies of correspondence shall include the Notice of Intent sent by the project owner to the SWRCB.~~ for the construction and operation of the surface impoundments (evaporation ponds) and storm water management system. These requirements relate to discharges, or potential discharges, of waste that could affect the quality of waters of the state, and were developed in consultation with staff of the State Water Resources Control Board and/or the applicable California Regional Water Quality Control Board (hereafter "Water Boards"). It is the Commission's intent that these requirements be enforceable by both the Commission and the Water Boards. In furtherance of that objective, the Commission hereby delegates the enforcement of these requirements, and associated monitoring, inspection and annual fee collection authority, to the Water Boards.

Accordingly, the Commission and the Water Board shall confer with each other and coordinate, as needed, in the enforcement of the requirements. The project owner shall pay the annual waste discharge permit fee associated with this facility to the Water Boards. In addition, the Water Boards may "prescribe" these requirements as waste discharge requirements pursuant to Water Code Section 13263 solely for the purposes of enforcement, monitoring, inspection, and the assessment of annual fees, consistent with Public Resources Code Section 25531, subdivision (c).

Verification: ~~At least 30 days prior to site mobilization, the project owner shall submit to the CPM and LRWQCB, a copy of the construction SWPPP for review and CPM approval prior to site mobilization. The project owner shall also submit to the CPM evidence of payment to LRWQCB of the appropriate compliance fee. The project owner shall retain a copy of the SWPPP on site. The project owner shall submit to the CPM copies of all correspondence between the project owner and the LRWQCB regarding the Waste Discharge Requirements for the discharge of storm water associated with construction activity within 10 days of its receipt or submittal. The project owner shall submit copies to the CPM of all correspondence between the project owner and the LRWQCB regarding the Requirements of Waste Discharge of process water and storm water associated with industrial activity within 10 days of its receipt or submittal. Copies of correspondence shall include the Notice of Intent sent by the project owner to the SWRCB.~~ No later than sixty (60) days prior to any wastewater or storm water discharge, the project owner shall provide documentation to the CPM, with copies to the LRWQCB, demonstrating compliance with the WDRs established in Appendices B, C, D and E. Any changes to the design, construction, or operation of the ponds or storm water system shall be requested in writing to the CPM, with copies to the LRWQCB, and approved by the CPM, in consultation with the LRWQCB, prior to initiation of any changes. The project owner shall provide to the CPM, with copies to the LRWQCB, all monitoring reports required by the WDRs, and fully explain any violations, exceedances, enforcement actions, or corrective actions related to construction or operation of the ponds or storm water system.

CONDITION OF CERTIFICATION SOIL&WATER-7, PAGES C.7-72 TO C.7-73

GROUNDWATER LEVEL MONITORING AND REPORTING PLAN

SOIL&WATER-7 The project owner shall submit a Groundwater Level Monitoring and Reporting Plan to San Bernardino County and to the CPM for review and approval in accordance with the County of San Bernardino Code Title 2, Division 3, Chapter 6, Article 5 (Desert Groundwater Management Ordinance).

The Groundwater Level Monitoring and Reporting Plan shall provide detailed methodology for monitoring background and site groundwater levels. Monitoring shall be conducted prior to construction, during construction, and throughout project operation. The primary objective for the monitoring is to establish pre-construction and project related groundwater level trends that can be quantitatively compared against observed and simulated trends near the project pumping well and dedicated monitoring wells. Water level measurements in the project's water supply well shall represent non-pumped conditions, and be collected a minimum of four hours after pump shut-down. Prior to project construction, monitoring shall commence to establish pre-construction base-line conditions and ~~shall incorporate any~~ reporting shall include existing monitoring ~~and reporting~~ data collected in the project area useful for quantifying hydraulic gradients across the Pisgah Fault and between the Lavic Lake and Lower Mojave groundwater basins. The monitoring network shall therefore be designed to also incorporate and report relevant ~~any~~ ongoing monitoring and reporting ~~program~~ activities currently occurring in existing groundwater wells located within the Lavic Lake and Lower Mojave groundwater basins.

In areas where groundwater elevation data is needed but existing wells are absent or do not represent the water-bearing zone from which the project water supply well extracts groundwater, ~~T~~the monitoring network shall be augmented with new monitoring wells.

Verification: The project owner shall complete the following:

1. At least two (2) months prior to power plant construction, a Groundwater Level Monitoring and Reporting Plan shall be submitted to the County of San Bernardino for review and comment before completion of Condition of Certification **SOIL& WATER-3**, and a copy of the County's comments and the plan shall be submitted the CPM for review and approval. The plan shall include a scaled map showing the site and vicinity, existing well locations, and proposed monitoring locations (both existing wells and new monitoring wells proposed for construction). The map shall also include relevant natural and man-made features (existing and proposed as part of this project). The plan also shall provide: (1) well construction information and borehole lithology for each existing well proposed for use as a monitoring well; (2) description of proposed drilling and well installation methods for new wells; (3) proposed monitoring well design; and, (4) schedule for completion of the work.
2. At least one (1) month prior to construction, a Groundwater Level Network Report shall be submitted to the CPM. The report shall include a scaled map showing the final monitoring well network. It shall document the drilling methods employed, provide individual well construction as-builds, borehole lithology recorded from the drill cuttings, well development, and well survey results for all new wells. The well survey shall measure the location and elevation of the top of the well casing and

reference point for all water level measurements, and shall include the coordinate system and datum for the survey measurements. Additionally, the report shall describe the water level monitoring equipment employed in the wells and document their deployment and use.

3. As part of the monitoring well network development, any newly constructed monitoring wells shall be permitted and constructed consistent with San Bernardino County and State specifications.
4. At least one (1) week prior to project construction, all water level monitoring data shall be provided to the CPM. The data transmittal shall include an assessment of pre-project water level trends, a summary of available climatic information (monthly average temperature and rainfall records from the nearest weather station), and a comparison and assessment of water level data.
5. After project construction and during project operations, the project owner shall submit the monitoring data annually to the CPM. The summary shall document water level monitoring methods, the water level data, water level plots, and a comparison between pre- and post-project start-up water level trends. The report shall also include a summary of actual water use conditions, monthly climatic information (temperature and rainfall), and a comparison and assessment of water level data. As part of this assessment, the project owner shall calculate water level trends and complete a 5-year projection of future water levels based on these trends and an evaluation of water supply reliability.

CONDITION OF CERTIFICATION SOIL&WATER-8, PAGES C.7-73 TO C.7-75

STORMWATER CONTROL/FLOOD PROTECTION DESIGN PLANS

SOIL&WATER-8: The project owner shall submit two (2) copies of the 30-percent, 60-percent and 90-percent design drawings for the grading and drainage facilities to the CPM for review and comment. The 30-percent, 60-percent and 90-percent design drawings for the grading and drainage facilities shall be accompanied by a basis of design report to convey and support the design approach.

To prepare the grading and drainage facilities drawings and accompanying basis of design report, the project owner shall do the following:

1. Conduct an analysis to quantify the design discharges and associated volumes of water, debris, and sediment associated with the 100-year storm at the apex of the fan under current watershed conditions.
2. Conduct a geomorphic and hydraulic analysis to determine the maximum design storm that can be routed through the site utilizing existing fluvial washes that will not result in significant damage to proposed site infrastructure.
3. Conduct a geomorphic and biologic analysis to determine the minimum design storm that can be routed through the site utilizing existing fluvial washes that will provide the necessary sediment load through the site and "downstream areas" to maintain existing sensitive habitat needs, as described in the *Geomorphic Assessment of Calico Solar Project Site*. This analysis must consider and address the need for fine sand to support the existing sensitive habitat and the potential episodic nature of the associated dune complex evolution that depends upon El Niño events (i.e., wet winters occurring approximately every 3 to 7 years) delivering sediment to the lower fan and the accompanying La Niña events (i.e., dry winters occurring approximately every 3 to 7 years) eroding and transporting fine sands to these dunes through wind action.
4. Determine the pass through design storm that can be routed through the site unimpeded to deliver the necessary sediment load through the site to maintain existing sensitive habitat needs in "downstream areas" and not result in significant damage to proposed site infrastructure.
5. Size, locate, and design each detention basin to allow the pass through design storm to move through the site unimpeded while capturing larger design storm flows and related sediment and debris to protect the proposed infrastructure.
6. Convey design of each basin by showing supporting calculations and design drawings to convey the basin in plan view, cross-sections, depth to spillway,

amount of freeboard to top of basin, basin volume to spillway, description of sidewall slopes, method of providing pass through design storm and related sediment unimpeded, method of providing erosion protection of basin side walls, inlet design, outlet design, spillway design, spillway erosion control, combined outlet maximum flow, transition from outlet to existing downstream fluvial wash, tortoise fence location and design, maintenance of tortoise fence, maintenance of basin, maintenance of excess sediment in basin from larger flood flows.

7. The project owner shall ~~apply for and receive approval~~ request comments from the Department of Water Resources Division of Safety of Dams (DSOD) for the plans and specifications for the construction of any dam(s) or reservoir(s) that are under DSOD jurisdiction prior to beginning construction, and forward all comments to the CPM.
8. For all flood control basin dams, the project owner shall provide at a minimum:
   - specific locations of basins and dams on appropriate scale map,
   - configuration of all basins and dams including basin-specific cross sections,
   - a description of all materials designed to be used in the construction of the dams,
   - footings designs,
   - designs of cutoff walls,
   - designs of keyways,
   - description and design of drainage pass though methods,
   - flow metering (ability to maintain maximum discharge to that of the maximum on-site flow design) technique and design,
   - method of and design of debris deflection (i.e. trash racks) for each basin,
   - emergency spillway design,
   - pass through pipe outlet energy dissipation method and design, and
   - basin inlet erosion protection.

9. In addition to the criteria discussed above, the basis of design report shall also follow the procedures outlined in the following documents as far as is applicable:
   a. San Bernardino County Drainage Manual and 2007 Development Code (amended, March 25, 2010).
   b. Federal Emergency Management Agency Guidelines for Determining Flood Hazards on Alluvial Fans and Guidelines and Specifications for Flood Hazard Mapping Partners.

   The project owner shall prepare a set of design specifications to supplement the 90-percent design drawings. Plans, specifications, computations and other data shall be prepared by persons properly licensed by the State of California. If the 60-percent plans or 90-percent plans and specifications do not comply with the appropriate Conditions of Certification, the necessary changes or revisions to the plans shall be made by the project owner. If the

CPM finds that the work described in the plans and specifications conform to the Conditions of Certifications in the Energy Commission Decision and other pertinent LORS, then the project owner shall submit two (2) copies of the 100-percent set for CPM review and approval. All design drawings must be submitted on bound or stapled 24" x 36" size paper.

Verification: Prior to site mobilization, the project owner shall prepare preliminary (30-percent) grading and drainage facilities drawings and accompanying basis of design report for CPM review and approval. No later than 30 days after publication of the Energy Commission Decision, the 60-percent set of design drawings and accompanying basis of design report shall be submitted to the CPM for review and approval. The project owner shall submit the 90-percent design drawings and accompanying basis of design report to the CPM for review and approval after the person who originally drew the plan or their duly authorized agent addresses the CPM's 60-percent submittal comments and required changes. The 100-percent design drawings and specifications (construction documents) shall be signed and sealed by a Registered Professional Engineer in the State of California and submitted as the final, approved set of construction documents prior to site mobilization. Prior to initiation of site construction, the 100-percent design drawings and specifications (construction documents) shall be submitted along with the final basis of design report signed and sealed by a Registered Professional Engineer and a Registered Professional Geologist in the State of California to the CPM for review and approval.

Thirty (30) days prior to initiation of construction of any dams that would be considered under the jurisdiction of DSOD, the project owner shall receive approval for dam construction from the CPM based on comments the CPM has received from the DSOD for dam design adequacy.

CONDITION OF CERTIFICATION SOIL&WATER-9, PAGES C.7-75 TO C.7-76

WATER SUPPLY RELIABILITY

SOIL&WATER-9: The annual monitoring report required by **SOIL&WATER-7** shall include an evaluation of water supply reliability. Based on the results of this evaluation, the CPM may request the project owner develop and submit a Water Conservation and Alternative Water Supply Plan. The purpose of this plan is to curtail and minimize water use to remediate observed water level and storage declines in the water bearing zone utilized ~~for~~ by the project until the proposed alternative supply is available.

Verification: The project owner shall provide a Water Conservation Plan within thirty (30) days after the request of the CPM. The plan shall be implemented immediately

upon approval by the CPM. Part of this plan shall include suspension of mirror washing until the water supply has stabilized or an alternative supply is available to provide the water. The project owner shall submit a Notice of Completion to the CPM within thirty (30) days of securing the alternative supply. The Notice of Completion shall list each plan component and document that it has been completed. Part of the documentation shall include water use records that show the conservation savings achieved. If development of an alternative water supply was part of the plan, the project owner shall provide all documentation, permits, as-builts, proof of a contract or other right to a long term supply and test results that may be required for the water supply. The Water Conservation Plan shall remain in effect until CPM approval of the project owner's Notice of Completion.

CONDITION OF CERTIFICATION SOIL&WATER-10, NEW

STORM WATER PERMITS

SOIL&WATER-10 NPDES GENERAL PERMIT FOR CONSTRUCTION ACTIVITY.

The project owner shall comply with the requirements of the general National Pollutant Discharge Elimination System (NPDES) permit for discharge of storm water associated with construction activity. The project owner shall submit copies of all correspondence between the project owner and the State Water Resources Control Board (SWRCB) or the LRWQCB regarding this permit to the CPM. The project owner shall also develop and implement a construction SWPPP for construction on the Calico solar project main site, laydown areas, pipeline, and transmission line.

Verification: The project owner shall submit a copy of the construction SWPPP to the CPM at least 10 days prior to site mobilization for review and approval, and retain a copy of the approved SWPPP on site throughout construction. The project owner shall submit copies of all correspondence between the project owner and the SWRCB or the LRWQCB regarding the NPDES permit for the discharge of storm water associated with construction activity to the CPM within 10 days of its receipt or submittal. Copies of correspondence shall include the Notice of Intent sent to the SWRCB, the confirmation letter indicating receipt and acceptance of the Notice of Intent, any permit modifications or changes, and completion/permit Notice of Termination.

CONDITION OF CERTIFICATION SOIL&WATER-11, NEW

SOIL&WATER-11 INDUSTRIAL FACILITY SWPPP

The project owner shall comply with the requirements of the General NPDES Permit for Discharges of Storm Water Associated with Industrial Activity, including development of an Industrial Facility SWPPP. If the Regional or State Board finds the project does not require a General NPDES Permit for Discharges of Storm Water Associated with Industrial Activity, written confirmation from either board confirming this permit is not required would satisfy this condition.

Verification: The project owner shall submit a copy of the Industrial Facility SWPPP for operation of the project to the CPM at least 60 days prior to the start of commercial operation and shall retain a copy of the approved SWPPP on site throughout the life of the project. The project owner shall submit copies of all correspondence between the project owner and the LRWQCB regarding the general NPDES permit for discharge of storm water associated with industrial activity to the CPM within 10 days of its receipt or submittal. Copies of correspondence shall include the Notice of Intent sent by the project owner to the SWRCB, the confirmation letter indicating receipt and acceptance of the Notice of Intent, and any permit modifications or changes.

REVISED APPENDICES B THROUGH E, PAGES C.7-89 TO C.7-132

SOIL AND WATER RESOURCES – APPENDIX B
FACTS FOR WASTE DISCHARGE

CALICO SOLAR PROJECT
SAN BERNARDINO COUNTY
Prepared by staff of the
Lahontan Regional Water Quality Control Board
for the
CALIFORNIA ENERGY COMMISSION

1. Reason for Action and Regulatory Authority

   The Applicant filed an Application for Certificate (AFC) with the Energy Commission on December 2, 2008. The application was originally submitted by SES Solar One, LLC, SES Solar Three, LLC and SES Solar Six, LLC as the SES Solar One Project. In January 2010, the above entities merged into Calico Solar, LLC and the name of the SES Solar One Project changed to the Calico Solar Project (Project).

   The AFC proposed the construction and operation of an 850-megawatt (MW) solar power plant on private and federal lands using the Applicant's proprietary SES SunCatcher™ technology. The technology consists of an approximate 38-foot high by 40-foot wide solar concentrator dish that supports an array of curved glass mirror facets. The mirrors collect and focus solar energy onto the heat exchanger of a power conversion unit. The power conversion unit then converts the solar thermal energy into 25 kilowatts of electricity. This power is then supplied to the grid as groups of SunCatchers are constructed. Construction of the power plant is scheduled to occur in two phases. The first phase would be developed for 275 MW and include the installation of up to 11,000 SunCatchers. The second phase would expand the Project to a total of 34,000 SunCatchers for a cumulative 850 MW. In conjunction with Project construction, the Applicant proposes to discharge wastes, dredged, and/or fill material to State waters. Additionally, construction and operation of the Project have the potential to impact water quality.

   Under the Warren-Alquist Act, and Governor's Executive Order S-14-08, the California Energy Commission (Energy Commission) has the authority to streamline permitting for renewable energy generation facilities. The Energy Commission implements this "in lieu of" process by incorporating the regulatory requirements and conditions of the various local and State agencies in its certification process. In accordance with Water Code Section 13263, the Lahontan Regional Water Quality Control Board (Lahontan Water Board) hereby "prescribes" the waste discharge requirements as adopted by the California Energy Commission for the Calico Solar Project. Because the Energy Commission has exclusive permitting authority over the Project under Public Resources Code section 25500, the Lahontan Water Board "prescribes" the waste discharge requirements for the sole purpose of authorizing

the Lahontan Regional Board to enforce them and undertake associated monitoring, inspection, and annual fee collection as if the waste discharge requirements were adopted by the Lahontan Water Board.

In a May 5, 2010 letter**,** the U.S. Army Corps of Engineers (USACE) determined that the drainages on the site are not waters of the United States (U.S.). However, the drainages affected by the Project are waters of the State, as defined by California Water Code (Water Code) section 13050, and are subject to State requirements in accordance with Water Code section 13260 and to the Water Quality Control Plan for the Lahontan Region (Basin Plan). All actions impacting or potentially impacting these drainages, including dredge and fill activities and construction and industrial activities, will be regulated through these requirements, which will be incorporated in the Energy Commission's certification process.

2. Waste Discharge Requirements History

The Project is a new facility. There are no previous Lahontan ~~Regional~~ Water ~~Quality Control~~ Board ~~(Lahontan Water Board)~~ actions for this Project or location. The final *Facts, Requirements, Groundwater Monitoring and Reporting Program* and *Surface Water Monitoring and Reporting Program* for waste discharges will address storm water, dredge and fill, and groundwater requirements for the Project. ~~The Groundwater and Surface Water Monitoring Programs are not included in these draft documents but will be included with the final documents after the Applicant submits a Report of Waste Discharge.~~

3. Climate

The Mojave Desert has a typical desert climate, i.e., extreme daily temperature changes, low annual precipitation, strong seasonal winds, and mostly clear skies.

The annual highest temperature in the Mojave Desert exceeds 100 degrees Fahrenheit. Winter temperatures are more moderate, with mean maximum temperatures in the 60s and lows in the 30s.

Nearby Barstow has a total average annual precipitation of less than 5 inches. Nearly 70 percent of the precipitation occurs between November and March. However, occasional heavy precipitation occurs in the summer due to thunderstorms.

4. Site Geology

a. Setting

The Project is located in the Lavic Valley in the east-central portion of the Mojave Desert geomorphic province, which is characterized by broad expanses of desert with localized mountains and dry lakebeds. The Project area occupies a broad alluvial fan/plain and is bounded on the north by the Cady Mountains, Sleeping Beauty Peak to the east, Pisgah Crater to the south, and the Lake Manix and Troy Lake basins to the west. Surface geology beneath the Project consists primarily of Quaternary alluvium and fanglomerate overlying older Quaternary alluvium. Small outcrops of Tertiary basaltic and andesitic volcanic rock outcrops are located in the

northeastern portion of the Project site. Small amounts of Holocene basalt from the Pisgah Crater eruption overlay the Quaternary alluvial deposits on the southwest and southeast edges of the Project site.

The elevation of the Project ranges from approximately 1,800 feet to 2,860 feet above mean sea level with topography generally sloping from the Cady Mountains toward the local topographic low at the normally dry Troy Lake. Slopes range from two to five percent across the site except for the western portion where slopes reduce to one percent.

b. Faulting and Seismicity

The Project site is located within a structural area variously referred to in literature as the Barstow-Bristol trough, the Eastern California Shear Zone, and the Mojave Extensional Belt. All refer, fully or in part, to an area of the Mojave Desert Geomorphic Province, which is characterized by northwest-trending right-lateral strike-slip faulting which has accounted for approximately 40 miles of extensional faulting since the middle Miocene.

Thirty-two faults and fault segments were identified within 80 miles of the Project site. Of the these 32 faults, two are located within 5 miles of the Project; the Lavic Lake and Pisgah-Buillon fault zones, both of which are designated Alquist-Priolo Earthquake Fault Zones. The Hector Mine Mw 7.1 earthquake of October 16, 1999 occurred along the apparent strike of both of these faults approximately 18 miles south of the Project area. This earthquake resulted in horizontal slip over an estimated 28 miles with a maximum displacement of approximately 17 feet. An unnamed Mw 5.1 earthquake occurred within the Project boundaries near the northern end of the Pisgah-Bullion fault zone, approximately 1 mile west of the proposed control building site, on December 16, 2008.

Two other fault systems, the Cady fault and the Ludlow fault, also have the potential to cause ground shaking. The Cady Fault is an east-west-trending left-lateral strike-slip fault within the Cady Mountains approximately 3 miles north of the northern site boundary. Quaternary movement has been documented on the Cady Fault where it offsets older alluvium. Younger alluvium covers the eastern end of the Cady Fault suggesting no recent movement. The Ludlow Fault is a northwest-trending right-lateral strike-slip fault that extends to within approximately 12 miles of the eastern boundary of the proposed project site. Quaternary movement has been reported for the Ludlow Fault.

The potential for actual fault-related ground rupture at the Project is considered very low, but evidence of Holocene movement has been found on nearly every major fault in the Eastern California Shear Zone. Events such as the Hector Mine earthquake and the unnamed earthquake of December 16, 2008 show the proposed site could be subject to intense levels of earthquake related ground shaking in the future.

c. Soils

Two soil associations would primarily be affected by the Project; the Carrizo-Rositas-Gunsight and the Nickel-Arizo-Bitter associations. The Carrizo-Rositas-Gunsight soil association occupies the majority of the site, while the Nickel-Arizo-Bitter association is present over much of the southern portion of the site, south of the Burlington Northern Santa Fe rail lines. The Carrizo-Rositas-Gunsight soils have a loamy fine sand texture, are somewhat excessively drained, indicate a permeability of 6-20 inches per hour, and have a 0.15 erosion (K) factor. The Nickel-Arizo-Bitter soils have a gravelly sandy loam texture, are well drained, indicate a 2 to 6 inch per hour permeability, and have a 0.10 erosion (K) factor. Erosion values below 0.15 indicate low erosion potential whereas erosion values above 0.4 are highly erodible.

5. Groundwater

The Project is located in the portions of the Lavic Valley and Lower Mojave River Valley groundwater basins (Department of Water Resources [DWR] groundwater basins No. 7-14 and 6-40, respectively). The Lavic Valley basin is bounded by non water-bearing rocks of the Cady Mountains on the north and east, of the Bullion Mountains on the south and east, of the Lava Bed Mountains on the southwest. The Pisgah fault appears to be a groundwater divide between the two groundwater basins. Parts of the eastern and northern boundaries are drainage divides. In the northern part of the basin, surface drainage and groundwater flow is toward Hector Siding and in the southern part of the basin, surface drainage and groundwater flow is toward Lavic (dry) Lake.

DWR Bulletin No. 118 indicates that groundwater in the Lavic Valley basin is found in Quaternary alluvial and lacustrine deposits. However, results of Well #3 installation activities indicate that the groundwater in Well #3, screened from 552 to 802 feet below ground surface (bgs) and from 1,042 to 1,142 feet bgs, is derived from older Tertiary-age deposits including sandstones, claystones, fanglomerates derived from granite and volcanics that are currently exposed in the Cady Mountains, and volcanics. Holocene age alluvium consists of unconsolidated, well-sorted, fine- to coarse-grained sand, pebbles, and boulders with variable amounts of silt and clay deposited in washes and alluvial fans. Pleistocene age deposits are composed of gently tilted, unconsolidated to moderately consolidated, moderately well bedded gravel, sand, silt and clay. Recharge to the basin is from percolation of runoff from surrounding mountains through alluvial fans and washes. Subsurface flow from adjoining basins may also contribute to recharge. The southwest-trending Pisgah fault is the northwest boundary of the Lavic Valley groundwater basin, and water levels appear to drop eastward across the fault, which indicates that this fault is likely a barrier to groundwater flow. The Lavic Lake fault cuts through the southern part of the Lavic Valley groundwater basin, but it is not known whether this fault is a groundwater barrier.

6. Water Supply

The Applicant has proposed using Well #3, a 1,142 feet deep well located on APN 0529-281-34 that was completed in April 2010, as the primary water supply for the

Project. Depth to water in Well #3 was approximately 343 feet bgs on April 18, 2010. Condition of Certification **SOIL&WATER-4** specifies that the Project shall not exceed 245 acre-feet per year (AFY) for all construction activities and 20 AFY for all operational activities. Pumping tests at Well #3 indicate that Well #3 can support the water demands of the Project and will not adversely affect water quality or groundwater levels during the Project. The Applicant will also submit a Groundwater Level Monitoring and Reporting Plan as required by Condition of Certification **SOIL&WATER-8** to ensure that no adverse affects are occurring because of the Project.

Water samples collected from Well #3 in April 2010 indicated arsenic and fluoride concentrations above primary maximum contaminant levels (MCLs) and iron, manganese, sulfate, specific conductance and total dissolved solids (TDS) concentrations above secondary MCLs. These results, including a 1,340 milligrams per liter (mg/L) TDS concentration, indicate fresh water in Well #3; however, due to the MCL exceedences and TDS concentrations, the groundwater would not be suitable for drinking water, mirror washing, or hydrogen generation without some form of treatment. The Applicant has proposed treating the water at an onsite facility prior to use. Water from Well #3 would be transported to the Main Services Complex via an underground waterline where it would be treated utilizing a reverse osmosis system, which may include a de-mineralization stage for mirror washing and hydrogen generation usage.

7. Surface Water

There are no perennial streams within the Project area. The Project site encompasses a series of coalesced alluvial fans that drain the Lava Bed Mountains to the south and the Cady Mountains to the north. Incised washes exist at the base of the Cady Mountains outside of the Project area. Sands transported to the valley floor by fluvial processes are redistributed by the wind to form a series of vegetated dunes adjacent to the larger washes.

Surface water flow does not occur within the Project area during most years. When water does flow, it is usually the result of precipitation occurring during 5- to 10-year storm events. During high flows, surface water runoff across the site and from the surrounding hills generally flows southwesterly toward Troy Lake.

8. Land Uses and Existing Site Conditions

The Project site is located on approximately 6,215 acres of land in San Bernardino County approximately 37 miles east of Barstow. The Project site consists primarily of public land managed by the Bureau of Land Management; however there are approximately 2,246 acres of undeveloped private land within the Project boundaries. This private land is under the jurisdiction of San Bernardino County and would not be part of the Project. There is also approximately 775 acres on the northeast portion of the Project that have been designated as Land and Water Conservation Fund mitigation lands.

The Project site consists primarily of mostly undisturbed desert alluvial sands and desert flora. Existing on-site land uses include the Burlington Northern Santa Fe railroad right of way, several underground high pressure gas pipelines, and Southern California Edison's

Pisgah Substation and overhead transmission lines. The surrounding area consists of undeveloped desert land and mountain terrain including wilderness study areas (WSA), areas of critical environmental concern (ACEC), and desert wildlife management areas (DWMA) along with small rural communities. The closest community is Newberry Springs located approximately 10 miles west of the Project. The Cady Mountain WSA is located directly adjacent to the northern Project boundary. The Pisgah ACEC is adjacent to the southeastern Project boundary. The Ord-Rodman DWMA is located adjacent to the southwestern Project boundary.

9. Description of Direct Impacts to State Waters

   The Project would directly or indirectly affect numerous ephemeral washes that occur on the Project site. The Applicant initially identified 1,099 acres of State waters on the Project site, with construction activities resulting in 356 acres of temporary impacts and 258 acres of permanent impacts. In total, this would result in direct impacts to 56% of the State jurisdictional drainages on site. However, because of the altered hydrology, the Project would result in impacts to all 1,099 acres of washes present on the site. In addition, washes located downstream of the project would be subject to impacts related to the modification of drainage patterns onsite. The attenuation of peak storm flows and the subsequent loss of sediment to the system from the detention basins can adversely affect biological resources dependent on these features. Since the initial evaluation, the Applicant has reduced the Project size and modified the drainage design resulting in lower State Water acreage and impact estimates. At this time, the Applicant has not provided revised estimates related to State Waters and impacts to account for the revised Project boundaries and design; however, these forthcoming estimates will be lower than originally proposed.

10. Mitigation and Monitoring Plan (and long-term management)

    The Applicant has not proposed specific mitigation to reduce impacts to State Waters, nor provided updated calculations following the reduction of Project size; however, the California Energy Commission ~~CEC~~ proposed Condition of Certification **BIO-27**, which includes acquisition of off-site waters, the implementation of Best Management Practices, and the replacement of lost smoke tree and catclaw acacia habitats as a potential mitigation measures. The Applicant can possibly meet the mitigation requirements of **BIO-27** with the implementation of **BIO-17**, which requires compensatory mitigation lands for desert tortoise. Condition of Certification **BIO-29** also requires a Channel Decommissioning and Reclamation Plan and financial assurances to guarantee an adequate level of funding to implement decommissioning and closure.

11. Storm Water Discharges

    Under pre-development conditions, the Facility site has a low gradient (between 2 and 5 percent) and storm water moves primarily via sheet flow and shallow concentrated flow. These conditions may be permanently modified by Project construction.

The following will regulate waste discharges in storm water runoff and other discharges associated with Project construction activity and industrial storm water runoff.

The Applicant is to maintain pre-development infiltration, surface retention and recharge rates in order to minimize post-development impacts to offsite water bodies and underlying groundwater. The Applicant is required to avoid adverse effects of altering the hydrologic characteristics (hydromodification) of the Project by site design and construction practices in accordance with the following:

a. Construction Storm Water Management

The Applicant estimates that Project construction will occur in two phases. Construction is tentatively scheduled to occur over an approximate five-year period beginning in 2010 through 2013 for Phase I and from 2013 through 2015 for Phase II. Construction activities will include the installation and connection of the SunCatcher™ solar groups; the building of the Main Services Complex and associated facilities; construction of access roads and laydown areas; installation of transmission towers and cable; trenching for underground water and hydrogen pipelines; and infrastructure improvements. Work associated with the above-activities include site preparation and grading; foundation construction; erection of major equipment and structures; installation of piping and pumps, electrical systems and control systems; and startup/testing.

Erosion and sedimentation control will be implemented to retain sediment on-site and to prevent violations of water quality standards. Site drainage during construction will follow predevelopment flow patterns, with discharge ultimately occurring at the Burlington Northern Santa Fe right of way and at the westernmost property boundary. A primary component of storm water management involves the construction of detention basins along the northern Project boundary to intercept flows from the Cady Mountains and provide for storm peak attenuation of the surface flows, thus protecting the Project from flooding, sediment deposition, and scour.

Fifteen days prior to beginning construction activities, the Applicant will submit to the California Energy Commission design documents, including the proposed drainage structures and the grading plan; an erosion and sedimentation control plan; related calculation and specifications; and soils, geotechnical, or foundation investigation reports, for review and approval as specified in Condition of Certification Civil-1. Site drainage will be managed in accordance with the best management practices (BMPs) as described in the Final Storm Water Pollution Prevention Plan (SWPPP), Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) and Final Drainage, Erosion, and Sediment Control Plan (DESCP).

b. Post-Construction Storm Water Management

The Applicant proposes to manage storm water, erosion and sedimentation at the completed Facility through a comprehensive system of source controls, treatment BMPs, and site design. At a minimum, the Applicant proposed to adhere to San Bernardino County's detention and retention requirements. Site drainage will be

managed in accordance with the BMPs as described in the Final SWPPP, BRMIMP and Final DESCP.

Onsite storm water will be diverted to detention areas distributed throughout the Facility. The detention areas will be designed to retain the 100-year on-site runoff and debris flows and retain 4-years of average sediment accumulation for the area or subarea they are designed to serve. After the 4-years average sediment accumulation is captured, the sediment will be removed from the basins and distributed on-site.

Off-site storm water flow will be intercepted prior to entering the Project by a series of large debris basin constructed along the northern boundary of the Project. The basins will be sized to retain the storm water discharge and associated debris resulting from the 100-year storm.

12. Receiving Waters

    The receiving waters are the minor surface waters of the Troy Valley Hydrologic Area (Hydrologic Subunit 628.62) and groundwaters of the Lavic Valley and Lower Mojave River Valley groundwater basins (Department of Water Resources [DWR] groundwater basins No. 7-14 and 6-40, respectively).

13. Lahontan Basin Plan

    The Lahontan Water Board adopted a Water Quality Control Plan for the Lahontan Basin (Basin Plan), which became effective on March 31, 1995. These requirements implement the Basin Plan.

14. Beneficial Uses -Surface Waters

    The Basin Plan designates beneficial uses for surface waters in each watershed of the Lahontan region. Beneficial uses of surface waters within the Facility area and vicinity that could be impacted by the Facility include:

    a. municipal and domestic water supply (MUN),
    b. agricultural supply (AGR),
    c. groundwater recharge (GWR),
    d. water contact recreation (REC-1),
    e. non-contact water recreation (REC-2),
    f. warm freshwater habitat (WARM),
    g. cold freshwater habitat (COLD),
    h. wildlife habitat (WILD).

15. Beneficial Uses -Groundwaters

    The Basin Plan designates beneficial uses for groundwaters in each watershed of the Lahontan region. Beneficial uses of groundwaters within the Facility area and vicinity that could be impacted by the Facility include:

    a. municipal and domestic water supply (MUN),

b. agricultural supply (AGR),
c. industrial surface supply (IND),
d. freshwater replenishment (FRSH).

16. Non-Degradation

The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16 (*Statement of Policy with Respect to Maintaining High Quality of Waters in California*). Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings or facts. The Basin Plan implements, and incorporates by reference, state antidegradation policies. The permitted discharge is consistent with the antidegradation provision of Resolution No. 68-16 because no degradation is proposed.

In accordance with State Water Board Resolution No. 68-16 and the Basin Plan, the following conditions must be met prior to any degradation of water of the State:

a. Any change in water quality must be consistent with maximum benefit to the people of the State;

b. The degradation will not unreasonably affect present and anticipated beneficial uses;

c. The degradation will not result in water quality less than that prescribed in the Basin Plan;

d. Discharges must use the best practicable treatment or control to avoid pollution or nuisance and maintain the highest water quality consistent with maximum benefit to the people of the State.

17. Other Considerations and Requirements for Discharge

Pursuant to Water Code section13241, these requirements take into consideration:

a. Past, present, and probable future beneficial uses of water.

These requirements identify past, present and probable future beneficial uses of water as described in Facts Nos. 14 and 15. The proposed discharge will not adversely affect present or probable future beneficial uses of water, including domestic water supply, agricultural supply, industrial supply, and freshwater replenishment.

b. Environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto.

Facts Nos. 6 through 10 describe the environmental characteristics and quality of water from this hydrographic unit.

c. Water quality conditions that could reasonably be achieved through the coordinated control of all factors that affect water quality in the area.

These requirements will not result in any significant changes to groundwater quality. Adverse effects to surface water quality will be minimized.

d. Economic considerations.

These requirements authorize the Discharger to implement closure and post-closure maintenance actions at the Facility as proposed by the Discharger. These requirements accept the Discharger's proposed actions as meeting the best practicable control method for protecting water quality from impacts from the Facility.

e. The need for developing housing within the region.

The Discharger is not responsible for developing housing within the region.

f. The need to develop and use recycled water.

The Energy Commission and the Discharger ~~are currently evaluating~~ evaluated the feasibility of using recycled water as the water source for Facility operations. No source of recycled water is available for use at the facility. Groundwater beneath the site was chosen as the source of water.

SURFACE IMPOUNDMENTS

18. Description of Surface Impoundments (evaporation ponds)

The Applicant ~~has not~~ provided ~~a~~ the August 5, 2010 *Report of Waste Discharge Lined Wastewater Evaporation Ponds – Calico Solar Project* (ROWD) ~~associated with~~ in relation to the two proposed ~~surface impoundments, but did provide general details within the AFC and the May 2010 Applicant's Supplement~~ on-site lined wastewater evaporation ponds. The Applicant has proposed two surface impoundments ~~to be used~~ for the disposal of saline wastewater generated by the reverse osmosis water treatment system. The Applicant assumes that the wastewater will be classified as a "designated waste" and will need to comply with the requirements for Class II surface impoundments set forth in California Code of Regulation (CCR) title 27. The surface impoundments will be designed to contain the 1,000-year, 24-hour precipitation storm event (pursuant to CCR, title 27, section 20310) while maintaining the mandatory 2-foot freeboard requirement.

Each pond is estimated to cover approximately one-half acre in surface area and will be designed to contain one year of wastewater discharge. Wastewater will be directed to each pond on an alternating basis, with accumulated bottom solids being tested and disposed of after undergoing the evaporation process. ~~The construction design, inspection, maintenance, and associated monitoring program for the surface impoundments should be included within the forthcoming ROWD and demonstrate compliance with CCR title 27.~~ The estimated wastewater discharge rate to the ponds is estimated to be a maximum of 5.1 gallons per minute or 8.2 acre-feet per year (afy); however, the Applicant proposes an annual discharge of up to 10 afy to allow for operational flexibility. TDS concentrations of wastewater are estimated to be 3 to

3.5 times the concentration of the original supply, or approximately 4,000 to 6,000 mg/L.

19. Surface Impoundments Construction Design

~~The Applicant has yet to submit a Report of Waste Discharge describing the construction design of the surface impoundments; however, any proposed design must comply with requirements set forth in CCR title 27 including requirements to contain the 1,000-year, 24-hour precipitation storm event (CCR, title 27, section 20310) while maintaining the mandatory 2 foot freeboard requirement.~~
The proposed design for the two surface impoundments, from the surface downwards, consists of the following:

a) A four-inch concrete liner;
b) One foot granular cushion layer;
c) One 40-millimeter HDPE liner; and
d) Layer of geonet sloped to a leak detection sump.

The above liner system will be installed on the side slopes and bottom of the pond. The ponds will be approximately 4 to 5 feet deep and the design will accommodate 2 feet of freeboard (including the provision for capture of the 1,000-year, 24 hour rainfall on the pond surface area). The inboard side slope will be at a slope of 2 feet horizontally for every vertical foot (or flatter). The outboard side slope will be at a slope of 3 feet horizontally for every one vertical foot (or flatter). The berm width at the crest will be approximately 10 feet. The horizontal interior dimensions of the evaporation pond(s) at the toe of the slope will be approximately 105 feet by 210 feet respectively, with a total storage of 325,000 gallons or one acre-foot in each pond (two feet storage depth over 0.5 acre of surface area without considering freeboard).

20. Leachate Collection and Removal System (LCRS)

In accordance with CCR, title 27, section 20340, LCRS are required for Class II surface impoundments. ~~The construction design, inspection and maintenance requirements for the LCRS should be included within the forthcoming ROWD.~~ The LCRS will consist of a layer of geonet sloped to a leak detection sump in each surface impoundment. The leak detection sump will include a 16-inch diameter leak-detection-and-removal-well fitted with an electronic leak sensor and a submersible pump to allow removal of collected fluids. The pump will discharge back into the surface impoundment. The discharge pipe shall be equipped with a recording flow totalizer to allow monitoring of the amount of fluid removed over time and calculation of leakage rates.

21. Action Leakage Rate of Surface Impoundment Liners

The Action Leakage Rate (ALR) is the allowable leakage from the primary liner system above which a spill prevention, control, and countermeasure (SPCC) plan

actions are triggered. According to Code of Federal Regulations, title 40, section 264.222, the ALR is defined as "…the maximum design flow rate that the leak detection system can remove without the fluid head on the bottom liner exceeding 1 foot." The ALR must also include an adequate safety margin to allow for variability in the containment system design (e.g., liner and collection pipe slope, interstitial fill hydraulic conductivity, thickness of drainage material, etc.). ~~The estimated ALR for the surface impoundments has not been provided. Any~~ The estimated ALR for the surface impoundments is 2,750 gallons per acre per day. This is based on one standard hole per acre, a drainage layer geonet with hydraulic conductivity of 0.06 meters per second and a 50 percent safety factor. The assumption underlying this ALR calculation will be verified in the actual constructed surface impoundments. Based on a 0.5-acre pond, each surface impoundment would have an ALR of 1,375 gallons per day. However, the ~~The~~ ALR will need to have field verification because this rate will vary depending on actual drainage material used and its hydraulic conductivity. A final ALR will be submitted to the California Energy Commission based on field analysis. The recording flow totalizer ~~monitoring~~ at each ~~surface impoundment~~ sump will be ~~required~~ monitored at least daily to determine the leakage rate through the primary liner. If the leakage rate exceeds the ALR, then the appropriate actions in the SPCC Plan will be implemented.

GROUNDWATER MONITORING NETWORK

22. Groundwater Monitoring Network (GMN)

~~The Applicant has not submitted a ROWD containing description of the proposed monitoring programs. Any proposed monitoring program needs to comply with CCR title 27, section 20415.~~ The Applicant proposed utilizing two existing groundwater wells west of the main services complex, noted as the Schraeger Well and Well #1, and installing one additional well southwest of the surface impoundments within the main services complex to comply with CCR title 27, section 20415. The two existing wells would serve as background wells and would be used to determine background groundwater quality and level. A third well, yet to be installed, would be used to establish hydraulic gradient and serve as both a detection and compliance well.

Groundwater flow direction has not been established with certainty. An additional groundwater monitoring well may be necessary after the third well is installed and the hydrogeological and water quality data from all three wells are evaluated.

MONITORING PROGRAMS

23. Statistical Methods

Statistical analysis of monitoring data is necessary for the earliest possible detection of a statistically significant evidence of a release of waste from the Facility. CCR, title

27 requires statistical data analysis. Any proposed Monitoring and Reporting Programs (MRPs) needs to include methods for statistical analysis. The monitoring parameters to be listed in the MRPs are believed to be the best indicators of a release from the Facility.

24. Detection Monitoring Program

    Pursuant to CCR, title 27 section 20420, the Applicant ~~needs to propose~~ proposed a detection monitoring program for the Facility. The detection monitoring program for the surface impoundments ~~may consist~~ consists of LCRS monitoring, ~~a~~ moisture ~~detection network, and~~ content monitoring ~~wells~~ utilizing neutron probes, and groundwater monitoring to evaluate the presence of the constituents of concern. Additional field verification procedures may include a combination of additional neutron analysis, laboratory analysis of liquids drawn from the neutron probe casing and visual observations, the program to monitor the LCRS and ~~water bearing media~~ groundwater for evidence of a release, as well as the monitoring frequency ~~should be~~ is specified in the MRP.

25. Evaluation Monitoring Program

    An Evaluation Monitoring Program is required, pursuant to CCR, title 27 section 20425, to evaluate evidence of a release if detection monitoring and/or verification procedures indicate evidence of a release.

26. Corrective Action Program

    A Corrective Action Program (CAP) to remediate detected releases from the surface impoundments ~~or land treatment unit~~ may be required pursuant to CCR, title 27, section 20430, if results of an EMP warrant a CAP.

27. Closure and Post-Closure Maintenance Plan for the Surface Impoundments

    The Applicant must submit a preliminary closure plan for the surface impoundments.

28. Reasonably Foreseeable Release for the Surface Impoundments

    The Applicant must submit a CAP to address a reasonably foreseeable release.

29. Narrative and Numerical Water Quality Objectives

    The Basin Plan incorporates narrative and numerical water quality objectives that apply to all ground and surface waters within the Lahontan Region. In general, where more than one objective is applicable, the stricter objective applies.

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SOIL AND WATER RESOURCES – APPENDIX C
REQUIREMENTS FOR WASTE DISCHARGE

I. DISCHARGE SPECIFICATIONS

A. Storm Water Discharges

Waste in discharges of storm water must be reduced or prevented to achieve the best practicable treatment level using controls, structures, and management practices. The Applicant shall comply with all requirements (with the exception of purely administrative requirements, e.g., filing a Notice of Intent) contained in State Water Board's *Waste Discharge Requirements For Discharges of Storm Water Discharges Associated With Construction Activity, General Permit No. CAS00002* and *Waste Discharge Requirements For Discharges of Storm Water Associated With Industrial Activities, General Permit No. CAS00001* and all subsequent revisions and amendments.

These requirements do not preclude the Applicant from requirements imposed by municipalities, counties, drainage districts, and other local agencies regarding discharges of storm water to separate storm sewer systems or other water, conveyances and water bodies under their jurisdiction.

B. Receiving Water Limitations

Surface Water and Groundwater Objectives

Receiving water limitations are narrative and numerical water quality objectives contained in the Water Quality Control Plan for the Lahontan Basin (Basin Plan) for all surface waters and groundwaters of the Lahontan Region. As such, they are required to be met. The discharge of waste to surface waters shall not cause, or contribute to, a violation of the following water quality objectives for waters of the Troy Valley Hydrologic Unit.

a. Ammonia

Ammonia concentrations shall not exceed the values listed in Tables 3-1 to 3-4 of the Basin Plan for the corresponding conditions in these tables. Tables 3-1 to 3-4 of the Basin Plan are incorporated into these requirements by reference.

b. Bacteria, Coliform

i. Waters shall not contain concentrations of coliform organisms attributable to anthropogenic sources, including human and livestock wastes.

ii. The fecal coliform concentration during any 30-day period shall not exceed a log mean of 20/100 milliliter (ml), nor shall more than 10 percent of all

samples collected during any 30-day period exceed 40/100 ml. The log mean shall ideally be based on a minimum of not less than five samples collected as evenly spaced as practicable during any 30-day period. However, a log mean concentration exceeding 20/100 ml, or one sample exceeding 40/100 ml, for any 30-day period shall indicate violation of this objective even if fewer than five samples were collected.

c. Biostimulatory Substances

Waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect the water for beneficial uses.

d. Chemical Constituents

i. Waters designated as MUN (a beneficial use of surface water of the Troy Valley Hydrologic Unit) shall not contain concentrations of chemical constituents in excess of the maximum contaminant level (MCL) or secondary MCL based upon drinking water standards specified in provisions of the CCR, Title 22, Division 4, Chapter 15, hereby incorporated by reference into these requirements. This incorporation-by-reference is prospective including future changes to the incorporated provisions as the changes take effect.

ii. Waters shall not contain concentrations of chemical constituents in amounts that adversely affect the water for beneficial uses.

e. Chlorine, Total Residual

For the protection of aquatic life, total chlorine residual shall not exceed either a median value of 0.002 milligrams per liter (mg/L) or a maximum value of 0.003 mg/L. Median values shall be based on daily measurements taken within any six-month period.

f. Color

Waters shall be free of coloration that causes nuisance or adversely affects the water for beneficial uses.

g. Dissolved Oxygen

i. The dissolved oxygen concentration as percent saturation shall not be depressed by more than 10 percent, nor shall the minimum dissolved oxygen concentration be less than 80 percent of saturation.

ii. For waters with the beneficial uses of WARM (a beneficial use of surface water in the Troy Valley Hydrologic Area), the minimum dissolved oxygen concentration shall not be less than that specified in Table 3-6 of the Basin Plan. Table 3-6 of the Basin Plan is incorporated herein by reference.

h. Floating Materials

i. Waters shall not contain floating material, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect the water for beneficial uses.

ii. The concentrations of floating material shall not be altered to the extent that such alterations are discernible at the 10 percent significance level.

i. Oil and Grease

i. Waters shall not contain oils, greases, waxes or other materials in concentrations that result in a visible film or coating on the surface of the water or on objects in the water, that cause nuisance, or that otherwise adversely affect the water for beneficial uses.

ii. The concentration of oils, greases, or other film or coat generating substances shall not be altered.

j. Pesticides

i. For the purposes of these requirements, pesticides are defined to include insecticides, herbicides, rodenticides, fungicides, piscicides and all other economic poisons. An economic poison is any substance intended to prevent, repel, destroy, or mitigate the damage from insects, rodents, predatory animals, bacteria, fungi, or weeds capable of infesting or harming vegetation, humans, or animals (California Agriculture Code 12753).

ii. Pesticide concentrations, individually or collectively, shall not exceed the lowest detectable levels, using the most recent detection procedures available. There shall not be an increase in pesticide concentrations found in bottom sediments. There shall be no detectable increase in bioaccumulation of pesticides in aquatic life.

iii. Waters designated as MUN shall not contain concentrations of pesticides or herbicides in excess of the limiting concentrations set forth in the CCR, Title 22, Division 4, Chapter 15. This incorporation-by-reference is prospective including future changes to the incorporated provisions as the changes take effect.

k. pH

i. In fresh waters with designated beneficial use of WARM, changes in normal ambient pH levels shall not exceed 0.5 pH units.

ii. The California Energy Commission recognizes that some waters of the Lahontan Region may have natural pH levels outside of the 6.5 to 8.5 range. Compliance with the pH objective for these waters will be determined on a case-by-case basis.

l. Radioactivity

i. Radionuclides shall not be present in concentrations, ~~which~~ that are deleterious to human, plant, animal, or aquatic life nor ~~which~~ that result in the accumulation of radionuclides in the food web to an extent, which presents a hazard to human, plant, animal, or aquatic life.

ii. Waters designated as MUN shall not contain concentrations of radionuclides in excess of the limits specified by the more restrictive of the CCR Title 22 Division 4, Article 5 sections 64441 et seq. This incorporation-by-reference is prospective including future changes to the incorporated provisions as the changes take effect.

m. Sediment

The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect the water for beneficial uses.

n. Settleable Materials

Waters shall not contain substances in concentrations that result in deposition of material that causes nuisance or that adversely affects the water for beneficial uses. The concentration of settleable materials shall not be raised by more than 0.1 milliliter per liter.

o. Suspended Materials

i. Waters shall not contain suspended materials in concentrations that cause nuisance or that adversely affect the water for beneficial uses.

ii. The concentration of total suspended materials shall not be altered to the extent that such alterations are discernible at the 10 percent significance level.

p. Taste and Odor

Waters shall not contain taste or odor-producing substances in concentrations that impart undesirable tastes or odors to fish or other edible products of aquatic origin, that cause nuisance, or that adversely affect the water for beneficial uses. The taste and odor shall not be altered.

q. Temperature

i. The natural receiving water temperature of all waters shall not be altered unless it can be demonstrated to the satisfaction of the California Energy Commission that such an alteration in temperature does not adversely affect the water for beneficial uses.

ii. For waters designated WARM, water temperature shall not be altered by more than 5 degrees Fahrenheit above or below the natural temperature.

r. Toxicity

i. All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.

ii. The survival of aquatic life in surface waters subjected to a waste discharge, or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge, or when necessary, for other control water that is consistent with the requirements for "experimental water" as defined in the most recent edition of *Standard Methods for the Examination of Water and Wastewater* (American Public Health Association, et al.).

s. Turbidity

i. Waters shall be free of changes in turbidity that cause nuisance or adversely affect the water for beneficial uses. Increases in turbidity shall not exceed natural levels by more than 10 percent.

ii. The discharge of waste to groundwaters shall not cause, or contribute to, a violation of the following water quality objectives for waters of the Lavic Valley and Lower Mojave River Valley Groundwater Basins.

a. Bacteria, Coliform

In groundwaters designated as MUN (a beneficial use of groundwater of the Lavic Valley and Lower Mojave River Valley Groundwater Basins), the median concentration of coliform organisms over any seven-day period shall be less than 1.1/100 milliliters.

b. Chemical Constituents

i. Groundwaters designated as MUN shall not contain concentrations of chemical constituents in excess of the maximum contaminant level (MCL) or secondary MCL based upon drinking water standards specified in provisions of the CCR, Title 22, Division 4, Chapter 15, hereby incorporated by reference into these requirements. This incorporation-by-reference is prospective including future changes to the incorporated provisions as the changes take effect.

ii. Groundwaters shall not contain concentrations of chemical constituents in amounts that adversely affect the water for beneficial uses.

c. Radioactivity

Groundwaters designated as MUN shall not contain concentrations of radionuclides in excess of the limits specified by the more restrictive of the CCR Title 22 Division 4, Article 5 sections 64441 et seq. This incorporation-by-reference is prospective including future changes to the incorporated provisions as the changes take effect.

d. Taste and Odor

Waters shall not contain taste or odor-producing substances in concentrations that cause nuisance or that adversely affect beneficial uses. For groundwaters designated MUN, at a minimum, concentrations shall not exceed adopted secondary MCLs based upon drinking water standards specified in provisions of the CCR, Title 22, Division 4, Chapter 15, hereby incorporated by reference into these requirements. This incorporation-by-reference is prospective including future changes to the incorporated provisions as the changes take effect.

II. PROHIBITIONS AND REQUIREMENTS

The discharge of wastes and fill associated with the Facility must not violate the following waste discharge prohibitions. These waste discharge prohibitions do not apply to discharges of storm water when wastes in the discharge are controlled through the application of management practices or other means and the discharge does not cause a violation of water quality objectives. The California Energy Commission expects that control measures will be implemented in an iterative manner as needed to meet applicable receiving water quality objectives.

A. Regionwide Prohibitions

1. The discharge of waste[(i)] which causes violation of any narrative water quality objective contained in the Basin Plan, including the Nondegradation Objective, is prohibited.

Definitions:

2. The discharge of waste which causes a violation of any numeric water quality objective contained in the Basin Plan is prohibited.
3. Where any numeric or narrative water quality objective contained in the Basin Plan is already being violated, the discharge of waste which causes further degradation or pollution is prohibited.
4. The discharge of untreated sewage, garbage, or other solid wastes into surface waters of the Region is prohibited. (For the purposes of this prohibition, "untreated sewage" is that which exceeds secondary treatment standards of the Federal Water Pollution Control Act, which are incorporated in the Basin Plan in Section 4.4 under "Surface Water Disposal of Sewage Effluent.")
5. For municipal[ii] and industrial[iii] discharges:
    a. The discharge, bypass, or diversion of raw or partially treated sewage, sludge, grease, or oils to surface waters is prohibited.
    b. The discharge of wastewater except to the designated disposal site (as designated in waste discharge requirements) is prohibited.
    c. The discharge of industrial process wastes[iv] to surface waters designated for the Municipal and Domestic Supply (MUN) beneficial use is prohibited. The discharge of industrial process wastes to surface waters not designated for the MUN use may be permitted if such discharges comply with the General Discharge Limitations in Section 4.7 of the Basin Plan and if appropriate findings under state and federal anti-degradation regulations can be made.

Prohibitions 5(b) and 5(c) do not apply to industrial storm water. For control measures applicable to industrial storm water, see Section 4.3 of this Basin Plan, entitled "Stormwater Runoff, Erosion, and Sedimentation."

Prohibitions 5(b) and 5(c) do not apply to surface water disposal of treated ground water. For control measures applicable to surface water disposal of treated ground water, see Lahontan Regional Board Order No. 6-93-104, adopted November 19, 1993 (Basin Plan Appendix B).

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[i] "Waste" is defined to include any waste or deleterious material including, but not limited to, waste earthen materials (such as soil, silt, sand, clay, rock, or other organic or mineral material) and any other waste as defined in the California Water Code § 13050(d).
[ii] "Municipal waste" is defined in Section 4.4 of the Basin Plan.
[iii] "Industry" is defined in Section 4.7 of the Basin Plan.
[iv] "Industrial process wastes" are wastes produced by industrial activities that result from one or more actions, operations, or treatments which modify raw material(s) and that may (1) add to or create within the effluent, waste, or receiving water a constituent or constituents not present prior to processing, or (2) alter water temperature and/or the concentration(s) of one or more naturally occurring constituents within the effluent, waste or receiving water. Certain non-stormwater discharges may occur at industrial facilities that are not considered to be industrial process wastes for the purposes of Prohibition 5(c). Examples include: fire hydrant flushing, atmospheric condensates from refrigeration and air conditioning systems, and landscape watering.

B. Facility Discharge Prohibitions

1. Activities and waste discharges associated with the Facility must not cause or threaten to cause a nuisance or pollution as defined in Water Code section 13050.
2. The discharge, including discharges of fill material, must be limited to that described in the California Energy Commission's Conditions of Certification.
3. The discharge or deposition of any wastes into channels, surface water, or any place where it would be discharged or deposited where it would be eventually transported to surface waters, including the 100-year floodplain, must not contain or consist of any substance in concentrations toxic to animal or plant life.
4. The discharge or deposition of any wastes into channels, surface water, or any place where it would be discharged or deposited where it would be eventually transported to surface waters, including the 100-year floodplain, must not contain or consist of oil or other floating materials from any activity in quantities sufficient to cause deleterious bottom deposits, turbidity, or discoloration in surface waters.
5. The discharge of waste, as defined in the Water Code, that causes violation of any narrative water quality objective contained in the Basin Plan is prohibited.
6. The discharge of waste that causes violation of any numeric water quality objective contained in the Basin Plan is prohibited.
7. Where any numeric or narrative water quality objective contained in the Basin Plan is already being violated, the discharge of waste that causes further degradation or pollution (as defined in Water Code Section 13050) is prohibited.
8. The discharge of septic tank pumpings (septage) or chemical toilet wastes to other than a sewage treatment plant or a waste hauler is prohibited.

C. Requirements

1. The Applicant shall develop a final Storm Water Pollution Prevention Program (SWPPP) in accordance with the State Water Board's *General Permit No. CAS00001* and *General Permit No. CAS00002*. This SWPPP, or any future revision to this SWPPP, shall be implemented after approval by the Compliance Project Manager (CPM)
2. The Applicant must, at all times, maintain appropriate types and sufficient quantities of material on site to contain any spill or inadvertent release of materials that may cause a condition of pollution or nuisance if the materials reach waters of the State.

3. Discharges of wastewater generated by the Facility's operations, including ~~cooling water~~ reverse osmosis wastewater, are not allowed to be released to the offsite environment.
4. The Applicant must permit California Energy Commission staff or their authorized representative upon presentation of credentials:
    a. Entry onto Facility premises.
    b. Access to copy any record required to be kept under the terms and conditions of the Conditions of Certification.
    c. Inspection of any treatment equipment, monitoring equipment, or monitoring method required by the Conditions of Certification.
    d. Sampling of any discharge or surface water covered by the Conditions of Certification.
5. The Applicant must immediately notify the California Energy Commission ~~and Water Board~~ by telephone whenever an adverse condition occurs as a result of ~~this~~ a discharge. Such a condition includes, but is not limited to, a violation of the conditions of the Conditions of Certification, a significant spill of petroleum products or toxic chemicals, or damage to control facilities that would cause noncompliance. A written notification of the adverse condition must be provided to the California Energy Commission within two weeks of occurrence. The written notification must identify the adverse condition, describe the actions necessary to remedy the condition, and specify a timetable, subject to any modifications by California Energy Commission staff, for the remedial actions.
6. The Applicant must comply with the Monitoring and Reporting Program for Surface Water and the Monitoring and Reporting Program for Groundwater, ~~to be~~ included in these requirements ~~after the Applicant submits a Report of Waste Discharge to the Lahontan Water Board~~.

III. PROVISIONS

A. Special Provisions for Fill Impacts to State Waters

1. Detailed final grading plans must be provided to the California Energy Commission a minimum of 60 days prior to commencement of construction activities.
2. Construction equipment must be clean and free from oil, grease, and loose metal material and must be removed from service if necessary to protect water quality.
3. No debris, cement, concrete (or wash water therefrom), oil or petroleum products must be allowed to enter into or be placed where it may be washed from the Facility site by rainfall or runoff into waters of the State. When operations are completed, any excess material must be removed from the Facility work area and any areas adjacent to the work area where such

material may be transported into waters of the State as defined in Water Code section 13050.

4. No equipment may be operated in areas of flowing or standing water; no fueling, cleaning, or maintenance of vehicles or equipment must take place within any areas where an accidental discharge to waters of the State may occur; construction materials and heavy equipment must be stored outside of the flow of the waters of the State. When work within the boundaries of waters of the State is necessary, the entire streamflow must be diverted around the work area, temporarily, as needed to control waste discharge.

B. Special Provisions for Storm Water

1. The Applicant must ensure that storm water discharges and non-storm water discharges do not cause or contribute to an exceedance of any applicable water quality standards.
2. At least 60 days prior to commencement of construction activities, the Applicant must develop and implement a Construction Area Monitoring Program (CAMP) in accordance with the Monitoring ~~Program~~ and Reporting ~~Requirements~~ Program for Surface Water.
3. Post-construction storm water flows emanating from the Facility site must not exceed predevelopment levels. Runoff from newly constructed impervious areas that is greater than background levels must be treated and detained to predevelopment runoff levels. Methods such as *low impact development* may be used to achieve this requirement (see State Board Resolution No. 2008-0030). Detention and/or infiltration facilities for a 10-year, one-hour storm event fulfills this requirement for the purposes of these requirements.
4. The Applicant must implement Best Management Practices (BMPs) to prevent or reduce the discharge of wastes associated with water contacting construction materials or equipment.
5. The Applicant must provide effective cover, mulch, fiber blankets, or other erosion control for soils disturbed by construction activities.
6. The Applicant must provide BMPs for erosion stabilization for all areas of disturbed soil regardless of time of year, including erosion from rainfall, non-storm water runoff, and wind.
7. The Applicant must stabilize from erosion all finished slopes, open space, utility backfill, and graded or filled lots within two weeks from when excavation or grading activity has been completed.
8. The Applicant must control runon from offsite areas, route flows away from disturbed areas in a manner that does not cause onsite or offsite erosion, and provide controls to minimize runon and problems from storm water flows into active or disturbed Facility areas from offsite areas.

9. The Applicant must, at all times, maintain effective perimeter controls and stabilize all construction entrances/exits sufficiently to control erosion and soil or sediment discharges from the site.
10. The Applicant must properly install and effectively maintain all BMPs for storm drain inlets and perimeter controls, runoff control BMPs, and stabilized entrances/exits.
11. The Applicant must ensure that construction activity traffic to and from the Facility is limited to entrances and exits that employ effective controls to prevent offsite tracking of soil.
12. The Applicant must ensure that all storm drain inlets and perimeter controls, runoff control BMPs, and pollutant control at entrances/exits are maintained and protected from activities that could reduce their effectiveness.
13. The Applicant must comply with the following source control requirements:
    a. Maintain vegetative cover to the extent possible by developing the Facility in a way that reduces the amount of soil exposed to erosion at any time.
    b. Inspect and remove accumulated deposits of soil at all inlets to the storm drain system at frequent intervals during rainy periods.
    c. Provide buffer strips and/or vegetation protection fencing between the active construction area and any water bodies.
    d. Provide “good housekeeping” measures for construction materials, waste management, vehicle storage and maintenance, and landscape materials at all times including, but not limited to, the list of required measures in Attachment B of the Monitoring and Reporting Program for Surface Water, that will be made a part of these requirements.
14. The Applicant must maintain, in perpetuity, post-construction control and treatment measures for storm water, or must identify in writing to the California Energy Commission, the entity that is legally responsible for maintaining the post-construction controls at the Facility site.
15. The Applicant shall have in place adequate emergency response plans in order to clean up any spill or release of any waste at the Facility.

C. Special Provisions for the Surface Impoundments

1. There shall be no discharge, bypass, or diversion of wastewater from the collection, conveyance, or disposal facilities to adjacent land areas or surface waters.
2. All facilities used for the collection, conveyance, or disposal of waste shall be adequately protected against overflow, washout, inundation, structural damage, or a significant reduction in efficiency resulting from a storm or flood having a recurrence interval of once in 100 years. The surface impoundments

shall be designed and maintained with the capacity to capture the 1,000-year, 24-hour storm.

3. The release of wastewater shall not cause the presence of the groundwater monitoring parameters to be listed in the Monitoring and Reporting Programs to be in excess of background levels.
4. The discharge, storage or evaporative accumulation of hazardous waste to waste management units at the Facility is prohibited.
5. Only wastewater from the reverse osmosis water treatment system shall be discharged to the surface impoundments.
6. The flow of wastewater to the surface impoundments shall not exceed a total of ~~[to be determined] million gallons per day~~ 10 acre-feet for any consecutive 12 month period.
7. The maximum average daily flow rate of wastewater to the surface impoundments shall not exceed ~~[to be determined] million~~ 9,000 gallons per day.
8. The discharge of wastewater at the facility except to the authorized disposal sites (i.e., the surface impoundments) of these requirements is prohibited.
9. All lined facilities shall be effectively sealed to prevent the exfiltration of liquids.
10. For this project, "effectively sealed" facilities are the surface impoundments that are designed and constructed in accordance with the requirements of CCR, title 27.
11. The vertical distance between the liquid surface elevation and the highest part of a surface impoundment dike (i.e., the freeboard), or the invert of an overflow structure, shall not be less than 2 feet.

D. Special Provisions for the Leachate Collection and Removal System

1. If liquids are detected in the leachate collection and removal system (LCRS) sumps at a rate equal to or greater than the verified “Action Leakage Rate,” then the Applicant~~s~~ shall comply with the notice of evidence of response to exceeding the action leakage rate requirements presented in the appropriate section of the Monitoring and Reporting Program for Groundwater ~~to be~~ included with these requirements ~~after the Applicant submits a Report of Waste Discharge to the Lahontan Water Board~~.
2. ~~If liquids are detected in the LCRS sumps at rates greater than the “Rapid and Large Leakage Rate,” the Applicants shall immediately notify the California Energy Commission and cease the discharge of waste to the affected impoundment. Discharges of waste to the affected impoundment shall be prohibited until the appropriate repairs are made~~.

3. The depth of leachate in the leachate collection sump shall be kept at the minimum needed to ensure efficient sump dewatering pump operation.
4. The LCRS shall be operated to function without clogging throughout the life of the project including closure and post closure maintenance periods.
5. The LCRS shall be tested at least once annually to demonstrate proper operation.
6. The LCRS shall be capable of removing twice the maximum anticipated daily volume of leachate from the surface impoundments.
7. Any leachate collected in any LCRS shall be returned to the surface impoundments.

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SOIL AND WATER RESOURCES – APPENDIX D
MONITORING AND REPORTING PROGRAM FOR SURFACE WATER

I. MONITORING

A. General Requirements

1. The applicant must comply with the "General Provisions for Monitoring and Reporting," which is attached to and made part of this Monitoring and Reporting Program (Attachment A).
2. The applicant must comply with the "Good Housekeeping Best Management Practices," which is attached to and made part of this Monitoring and Reporting Program (Attachment B).

B. Construction Site Storm Event Water Monitoring

The applicant must monitor site precipitation continuously and keep a record of storm events that produce more than 0.5 inch of precipitation at the site.

During storms and/or within one business day after each 0.5 inch of precipitation from a storm event, the applicant must visually observe and document observations of storm water discharges from the site ~~to both the unnamed wash and to Pine Tree Creek~~.

For visual observations, the applicant must look for and document the presence or absence of floating and suspended materials, a sheen on the surface, discolorations, turbidity, odors, and source(s) of any observed pollutants.

The applicant must visually observe and document observations of the discharge of stored or contained storm water that is discharged subsequent to a storm event. The applicant is only required to visually observe such discharges if they occur under daylight conditions. Stored or contained storm water that will likely discharge after operating hours due to anticipated precipitation must be observed prior to the discharge to determine whether controls and <u>best management practices</u> (BMPs) are in place and functioning as required.

For the purposes of these requirements, a "potential storm event" is defined as any storm event with a 30 percent or greater chance of precipitation as predicted by the National Weather Service's nearest weather station for the local climate zone. Forty-eight (48) hours prior to each potential storm event, the applicant must visually observe and implement appropriate corrective action for (1) all storm water drainage areas, to identify any spills, leaks, or uncontrolled pollutant sources, (2) all ~~Best Management Practices~~ ~~(~~BMPs; see Attachment B~~)~~, to identify whether they have been properly installed and maintained, and (3) any storm water storage and containment areas, to detect leaks and ensure maintenance of adequate freeboard.

Within one business day after each storm event that produces precipitation of 0.5 inch or more, the applicant must conduct a post-storm event inspection to:

1. identify whether BMPs were adequately designed, implemented, and effective,
2. identify if and where additional BMPs are needed, where BMPs are in need of maintenance, and
3. photograph each discharge location and the associated BMPs.

Within one business day after the initial 0.5 inch of precipitation from a storm event, and every 1 inch thereafter, the applicant must collect and analyze samples of storm water discharged from each detention basin.

If no discharge occurs from a basin, no sample is required, but the absence of discharge must be documented.

Storm water sampling and analyses must be performed in accordance with the following requirements:

1. The applicant must analyze the samples for pH and turbidity.
2. The applicant is not required to physically collect samples or conduct visual observations during dangerous weather conditions or outside of scheduled site operation hours.

The applicant must perform sampling of storm water discharges from all drainage areas associated with construction activity. The storm water discharge collected and observed must represent the worst quality storm water discharge in each drainage area based on visual observation of the water and upstream conditions. For example, if there has been concrete work recently in an area, or drywall scrap is exposed to the rain, a pH sample must be taken of drainage from the relevant work area. Similarly, if muddy water is flowing through some parts of a silt fence, samples must be taken of the muddy water even if most water flowing through the fence is clear.

C. Construction Site Monitoring

1. On a daily basis, the applicant must inspect all public and private paved roads serving the Facility and daily remove, by vacuuming or sweeping, visible accumulations of sediment or other construction activity-related materials that are deposited on the roads. All inspections under this provision must be documented in writing.
2. The applicant must ensure that inspections and observations at locations where runoff may discharge from the Facility site are performed weekly, and at least once each 24-hour period during extended storm events, to identify any problems and/or BMPs that:
    a. need maintenance to operate effectively,
    b. have failed, or

c. are inadequate to achieve effective control.

3. The applicant must visually observe construction areas and each drainage area for the presence of (or indication of prior) non-storm water discharges and their sources to ensure that all BMPs are in place and effective.

   a. One visual observation must be conducted quarterly in each of the following periods: January – March, April – June, July – September, and October – December. Visual observations are only required during daylight hours (sunrise to sunset).

   b. Visual observations must document the presence of evidence of any non-storm water discharge, pollutant characteristics (floating and suspended material, sheen, discoloration, turbidity, odor, etc.), and source. The applicant must maintain on-site records indicating the personnel performing the visual observation, the dates and approximate time each drainage area and non-storm water discharge was observed, and the response taken to eliminate non-storm water discharges and to reduce or prevent pollutants from contacting non-storm water discharges.

4. The applicant must monitor and report runon from surrounding areas that may contribute to exceedances or excursions from requirements (violations).

D. Post-Construction Monitoring

On a semi-annual basis, the applicant must inspect and document inspections of post-construction treatment controls at the Facility site. Maintenance must be provided to address any controls that ~~are~~ do not ~~in compliance~~ comply with requirements.

E. Receiving Water Monitoring

1. Receiving water sampling must occur at the following locations:

   a. 200 feet upstream of the ~~Facility~~ project site in the natural watercourse.

   b. 200 feet downstream of the ~~Facility~~ project in the natural watercourse.

   c. Midpoint between the upstream and downstream samples.

   d. 50 feet downstream of each outfall ~~into the above creeks~~.

2. Twice monthly and at no less than 10-day intervals from November through May of each year, the applicant must sample the Facility's receiving waters, with grab samples for the following constituents:

   a) Turbidity,
   b) Temperature,
   c) Dissolved Oxygen,
   d) Suspended Solids,
   e) Total Dissolved Solids, and
   f) pH.

If no water is present (documented by photographs), no sampling is required.

3. The applicant must also sample the receiving waters for the above parameter(s) when discharge from any detention basin occurs.

II. REPORTING

A. Required Program Reports

1. The applicant must develop and implement a Construction Area Monitoring Program (CAMP), as described in II.~~C~~ B, below, and provide the CAMP to the CPM 60 days prior to commencement of construction activities. The CAMP must include receiving water monitoring locations as required above.

2. The applicant must provide a Sampling and Analysis Plan (SAP) ~~as referenced in I.A, above,~~ to the California Energy Commission 60 days prior to commencement of construction activities.

B. Construction Area Management Plan

1. The CAMP must be developed and implemented to address the following objectives:
   a. To demonstrate that the site ~~is in compliance~~ complies with these requirements;
   b. To determine whether immediate corrective actions, additional BMP implementation, or Storm Water Pollution Prevention Plan (SWPPP) revisions are necessary to reduce pollutants and wastes in storm water discharges and non-storm water discharges; and
   c. To determine whether BMPs included in the SWPPP are effective in preventing or reducing pollutants in storm water discharges.
2. The applicant must develop a written site-specific CAMP that includes all monitoring procedures and instruction, location maps, forms, and checklists as required in these requirements and this MRP. This CAMP must be made a part of a revised SWPPP that is to be kept and used on the Facility site.

C. Storm Water Pollution Prevention Plan Annual Report

1. The applicant must prepare and provide an annual report no later than ~~June~~ January 30 of each year.
2. The Annual Report must include a summary and evaluation of all sampling and analysis results, original laboratory reports, a summary of all corrective actions taken during the compliance year, identification of any recommended compliance activities or corrective actions that were not implemented.
3. The Annual Report must include all records and reports of visual observations and sample collection exceptions, the analytical method, method reporting unit, and method detection limit of each analytical parameter. Analytical results that are less than the method detection limit must be reported as “less than the method detection limit.”

D. Records

1. The applicant must maintain records on-site of all visual observations, personnel performing the observations, observation dates, weather condition, locations observed, and corrective actions taken in response to the observations.
2. All inspections and observations pursuant to Section I.C. above must be documented in writing and must include:
   a. Inspector's name, title, and signature.
   b. Inspection date and date the inspection report was written.
   c. Weather information: estimate of beginning of storm event, duration of event, time elapsed since last storm, and approximate amount of rainfall (inches).
   d. A list and description of BMPs evaluated and any deficiencies noted. If there are no deficiencies, the report must indicate (under penalty of perjury) that the Facility ~~is in compliance~~ complies with these discharge requirements.
   e. Report the presence of noticeable odors or any visible sheen on the surface of any discharges.
   f. Corrective actions required, including any changes necessary to comply with requirements, and implementation dates for completing corrective actions.
   g. Photographs taken during the inspection.
3. Records of all storm water monitoring information and copies of all reports (including Annual Reports) required by these requirements must be retained for a period of at least five years from the date of the sample, measurement, report, or application. This period may be extended when requested by the CPM. Records must be retained on-site while construction is ongoing. The records must include:
   a. The date, place, time of facility inspections, sampling, visual observation, and/or measurement, including precipitation;
   b. The individual(s) who performed the facility inspections, sampling, visual observations, and or measurement;
   c. The date and approximate time of analyses;
   d. The individual(s) and company who performed the analysis;
   e. A summary of all analytical results from the last five years, the method detection limits and reporting units, and the analytical techniques or methods used;
   f. Quality assurance/quality control records and results;

g. Non-storm water discharge inspections and visual observations and storm water discharge visual observation records; and

h. Visual observation and sample collection exception records.

ATTACHMENT A
GENERAL PROVISIONS FOR MONITORING AND REPORTING

1. SAMPLING AND ANALYSIS

a. All analyses shall be performed in accordance with the current edition(s) of the following documents:

   i. Standard Methods for the Examination of Water and Wastewater

   ii. Methods for Chemical Analysis of Water and Wastes, EPA

b. All analyses shall be performed in a laboratory certified to perform such analyses by the California ~~State~~ Department of Public Health ~~Services~~ or a laboratory approved by the Compliance Project Manager (CPM). Specific methods of analysis must be identified on each laboratory report.

c. Any modifications to the above methods to eliminate known interferences shall be reported with the sample results. The methods used shall also be reported. If methods other than EPA-approved methods or Standard Methods are used, the exact methodology must be submitted for review and must be approved by the CPM prior to use.

d. The applicant shall establish chain-of-custody procedures to insure that specific individuals are responsible for sample integrity from commencement of sample collection through delivery to an approved laboratory. Sample collection, storage, and analysis shall be conducted in accordance with an approved Sampling and Analysis Plan (SAP). The most recent version of the approved SAP shall be kept at the facility.

e. The applicant shall calibrate and perform maintenance procedures on all monitoring instruments and equipment to ensure accuracy of measurements, or shall insure that both activities will be conducted. The calibration of any wastewater flow measuring device shall be recorded and maintained in the permanent log book described in 2.b, below.

f. A grab sample is defined as an individual sample collected in fewer than 15 minutes.

g. A composite sample is defined as a combination of no fewer than eight individual samples obtained over the specified sampling period at equal intervals. The volume of each individual sample shall be proportional to the discharge flow rate at the time of sampling. The sampling period shall equal the discharge period, or 24 hours, whichever period is shorter.

2. OPERATIONAL REQUIREMENTS

a. Sample Results

The applicant shall maintain all sampling and analytical results including: strip charts; date, exact place, and time of sampling; date analyses were performed; sample collector's name; analyst's name; analytical techniques used; and results of all analyses. Such records shall be retained for a minimum of three years. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge, or when requested by the California Energy Commission.

b. Operational Log

An operation and maintenance log shall be maintained at the facility. All monitoring

and reporting data shall be recorded in a permanent log book.

3. REPORTING

a. For every item where the requirements are not met, the applicant shall submit a statement of the actions undertaken or proposed which will bring the discharge into full compliance with requirements at the earliest time, and shall submit a timetable for correction.

b. All sampling and analytical results shall be made available to the CPM upon request. Results shall be retained for a minimum of three years. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge, or when requested by the CPM .

c. The applicant shall provide a brief summary of any operational problems and maintenance activities to the California Energy Commission with each monitoring report. Any modifications or additions to, or any major maintenance conducted on, or any major problems occurring to the wastewater conveyance system, treatment facilities, or disposal facilities shall be included in this summary.

d. Monitoring reports shall be signed by:

   i. In the case of a corporation, by a principal executive officer at least of the level of vice-president or his duly authorized representative, if such representative is responsible for the overall operation of the facility from which the discharge originates;

   ii. In the case of a partnership, by a general partner;

   iii. In the case of a sole proprietorship, by the proprietor; or

   iv. In the case of a municipal, state or other public facility, by either a principal executive officer, ranking elected official, or other duly authorized employee.

e. Monitoring reports are to include the name and telephone number of an individual who can answer questions about the report.

ATTACHMENT B
GOOD HOUSEKEEPING BEST MANAGEMENT PRACTICES

1. Good housekeeping measures for construction materials include:
   a. Maintaining an inventory of the products used and/or expected to be used and the end products that are produced and/or expected to be produced.
   b. Covering and berming loose stockpiled construction materials (i.e., soil, spoils, aggregate, fly-ash, stucco, hydrated lime, etc.).
   c. Storing chemicals in watertight containers or in a bermed storage shed (completely enclosed), with appropriate secondary containment.
   d. Minimizing contact of construction materials with precipitation.
   e. Implementing BMPs to reduce or prevent the offsite tracking of loose construction and landscape materials.
2. Good housekeeping measures for waste management include:
   a. Preventing disposal of any rinse/wash waters or materials into the storm drain system.
   b. Berming sanitation facilities (e.g., Porta-Potties) and preventing them from being kept within the curb and gutter or on sidewalks or adjacent to a storm drain.
   c. Cleaning or replacing sanitation facilities and inspecting them regularly for leaks and spills.
   d. Covering waste disposal containers when they are not in use and preventing them from overflowing.
   e. Berming and securely protecting stockpiled waste material from wind and rain at all times unless actively being used where spill would enter surface drainage systems.
   f. Addressing procedures to deal with hazardous and non-hazardous spills.
   g. Preparing and implementing a spill response and implementation plan prior to commencement of construction activities, including:
      i. Locations of on-site equipment and materials for cleanup of spills and leaks.
      ii. Procedures to follow in the event of spill or leak that includes immediate cleanup.
      iii. Locations and procedures of disposing of waste materials.
      iv. Identification of and training for spill response personnel.

h. Lining and berming of concrete washout areas so there is no leakage or overflow into the underlying soil and onto the surrounding areas. Washout areas must be positioned away from drain inlets and waterways and be clearly labeled.

3. Good housekeeping measures for vehicle storage and maintenance include:
   a. Not allowing oil, grease, or fuel to leak in to the soil.
   b. Placing all equipment or vehicles to be fueled, maintained and/or stored in a designated area fitted with appropriate BMPs.
   c. Cleaning leaks immediately and disposing of leaked materials and sorbents properly.
   d. Fix leaks immediately or remove equipment for service.

4. To assess the potential pollutant sources and identify all areas of the site where good housekeeping or additional BMPs are necessary to reduce or prevent pollutants in storm water discharges and non-storm water discharges, the applicant must assess and report on the following:
   a. The quantity, physical characteristic (liquid, powder, solid, etc.), and locations of each potential pollutant source handled, produced, stored, recycled, or disposed of at the site.
   b. The degree to which pollutants associated with those materials may be exposed to and mobilized by contact with storm water.
   c. The direct and indirect pathways that pollutants may be exposed to storm water discharges and non-storm water discharges. This must include an assessment of past spills or leaks, non-storm water discharges, and discharges from adjoining areas.
   d. Sampling, visual observation, and inspection records.
   e. Effectiveness of existing BMPs to reduce or prevent pollutants in storm water discharges and non-storm water discharges.

SOIL AND WATER RESOURCES – APPENDIX E
MONITORING AND REPORTING PROGRAM FOR GROUNDWATER (TWO SURFACE IMPOUNDMENTS)

I. WATER QUALITY PROTECTION STANDARD

Water Quality Protection Standard is required by Title 27 of the California Code of Regulations (CCR, title 27) to assure the earliest possible detection of a release from the Beacon Solar Energy Project (Beacon) to underlying soil and/or groundwater. The Water Quality Protection Standard shall consist of the list of constituents of concern, the concentration limits, the Point of Compliance and all Monitoring Points. This Water Quality Protection Standard shall apply during the operation, closure, post-closure maintenance period, and during any compliance period.

II. MONITORING

A. Flow Monitoring of Discharges to the Surface Impoundments (the two evaporation ponds)

Discharge to the surface impoundments is primarily derived from wastewater from the water treatment reverse osmosis stream. Wastewater from this source will be discharged to the surface impoundments.

The applicant shall monitor the following:

1. The volume, in gallons per day (gpd), of wastewater delivered to the surface impoundments;
2. The cumulative total of wastewater flow delivered to the surface impoundments, in million gallons per month; and
3. The maximum daily flow rate, in gpd, delivered to the surface impoundments each month.

B. Monitoring of Wastewater Discharges to the Surface Impoundments

Semi-annually, the applicant shall record the following:

1. The sources of wastewater delivered to the surface impoundments;
2. The amount and types of chemical additives added to the water that may be discharged to the surface impoundments; and
3. The analytical results of a composite wastewater grab sample that shall be collected and analyzed for the parameters in Table II-1.

Wastewater Sampling Parameters Table II-1

Parameter	U.S. EPA or Standard Method	Reporting Limit Goal	Units
Ammonia (as N)	350.1	100	µg/L
Aluminum	200.7	20	µg/L
Arsenic	6020	2	µg/L
Antimony	6020	10	µg/L
Barium	6020	5	µg/L
Beryllium	6020	2	µg/L
Boron	200.7	140	µg/L
Cadmium	6020	5	µg/L
Calcium	200.7	40,000	µg/L
Chloride	300.0	14,000	µg/L
Chromium (total)	6020	5	µg/L
Cobalt	6020	5	µg/L
Copper	6020	5	µg/L
Cyanide (total)	SM 4500	10	µg/L
Fluoride	300.0	500	µg/L
Iron	200.7	20	µg/L
Lead	6020	3	µg/L
Magnesium	200.7	10,000	µg/L
Manganese	200.7	15	µg/L
Mercury	7470A	0.2	µg/L
Molybdenum	6020	10	µg/L
Nickel	6020	5	µg/L
Nitrate as nitrogen	300.0	1,000	µg/L
Nitrite as nitrogen	SM 4500	4	µg/L
Phosphate (total)	365.3	100	µg/L
Potassium	200.7	3,000	µg/L
Selenium	6020	10	µg/L
Silver	6020	5	µg/L
Sodium	200.7	10,000	µg/L
Strontium	200.7	500	µg/L
Sulfate	300.0	100.000	µg/L
Thallium	6020	10	µg/L
Total dissolved solids	SM 2540C	10,000	µg/L
Total alkalinity (as $CaCO_3$)	SM 2320B	100,000	µg/L
Vanadium	6020	5	µg/L
Zinc	6020	10	µg/L
Biphenyl	8015M	500	µg/L
Diphenyl oxide	8015M	500	µg/L
Cyclohexamine (20-40%)	8015M	500	µg/L
Morpholine (1-10%)	8015M	500	µg/L
pH	Field	+/- 0.1	pH units
Temperature	Field	+/- 0.1	° F or °C

µg/L = micrograms per liter

C. Surface Impoundment Monitoring

1. Dikes and Liners

   a. Daily, the freeboard shall be measured from the top of the lowest part of the dike to the wastewater surface. If the surface impoundment is dry, indicate that it is empty of wastewater.

   b. Monthly, the integrity of the dikes and liners shall be inspected. Should the inspection indicate any damage to the dikes or liners or if an unauthorized discharge has occurred, or is likely to occur, the California Energy Commission shall be notified within 48 hours, followed by confirmation in writing.

2. Leachate Collection and Removal System (LCRS)

   a. Weekly, visual inspection for liquid in the leachate collection detection sumps for each surface impoundment shall be conducted. The results of those inspections shall be recorded in a permanent log book.

   b. All volume of liquid pumped out of the leakage detection sumps for each surface impoundment shall be recorded along with date, time and discharge location, in a permanent log book kept on-site.

3. Surface Impoundment Wastewater Monitoring

Semi-annually, at each surface impoundment, liquid grab samples shall be collected at three (3) sample locations in the surface impoundments spaced approximately equidistant. The collected samples shall be composited into one sample by the laboratory and analyzed to determine the quantification of the parameters in Table II-1.

4. Surface Impoundment Sludge Monitoring

Annually, in the last quarter of each year, three (3) representative grab samples of the bottom sludge in each surface impoundment, if present, shall be collected, composited and analyzed for the parameters in Table II-2.

Surface Impoundment Sludge Monitoring
Table II-2

Parameters	Unit
CCR title 22 metals (CAM 17)- Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Mercury, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc	Milligrams per kilogram (mg/kg)

D. Detection Monitoring

Using approved statistical or non-statistical data analysis methods approved in these requirements, and in compliance with CCR, title 27, the applicant shall, for each monitoring event, compare the concentration of each monitoring parameter with its respective concentration limit to determine if there has been a release from the surface impoundments. Monitoring shall be completed in compliance with this Section D as further described below.

1. Unsaturated Zone Monitoring – Neutron Probe

    a. Quarterly, the applicant shall check for moisture below the surface impoundment liners using a neutron moisture probe calibrated for use at the site. If moisture content is detected above 30 percent by volume, field verification testing shall be performed and the applicant shall notify the California Energy Commission and report physical evidence of a release (see notification procedures below). Field verification testing may include a combination of additional neutron analysis, laboratory analysis of liquids drawn from the neutron probe casing and visual observation to verify existence of a release.

    b. Annually, the applicant shall submit documentation of instrument calibration and performance checks. Performance checks shall be a comparison of quarterly results of neutron moisture. Pre testing with earlier tests made under comparable conditions to verify proper operation of equipment must be documented.

2. Groundwater Monitoring

    A Groundwater Monitoring Network (GMN) shall include three categories of monitoring wells: (1) background wells (located upgradient of the surface impoundments); (2) detection wells (located adjacent to the surface impoundments); and (3) compliance wells. The detection wells are comprised of three proposed wells (MW-1 through MW-3) located immediately adjacent to the surface impoundments. The Point of Compliance as defined in CCR, title 27, section 20405 is "a vertical surface located at the hydraulically down gradient limit of the Unit that extends through the uppermost aquifer underlying the Unit."

    a. Semi-annually, samples shall be collected in the groundwater monitoring network as proposed in the June 2009 ROWD and analyzed for the parameters listed in Table II-3.

    The results of the analysis shall be reported in a semi-annual report in tabular and graphical form. Each such graph shall be plotted with raw data at a scale appropriate to show trends or variations in water quality. For graphs showing the trends of similar constituents, the scale shall be the same. The data shall also be used to construct an Upper Tolerance Limit to determine evidence of a release and shall be used to evaluate data from the previous three quarters for evidence of a release.

Monitoring Well Sampling Parameters
Table II-3

Parameter	U.S. EPA or Standard Method	Reporting Limit Goal	Units
Ammonia (as N)	350.1	100	µg/L
Aluminum	200.7	20	µg/L
Arsenic	6020	2	µg/L
Antimony	6020	10	µg/L
Barium	6020	5	µg/L
Beryllium	6020	2	µg/L
Boron	200.7	140	µg/L
Cadmium	6020	5	µg/L
Calcium	200.7	40,000	µg/L
Chloride	300.0	14,000	µg/L
Chromium (total)	6020	5	µg/L
Cobalt	6020	5	µg/L
Copper	6020	5	µg/L
Cyanide (total)	SM 4500	10	µg/L
Fluoride	300.0	500	µg/L
Iron	200.7	20	µg/L
Lead	6020	3	µg/L
Magnesium	200.7	10,000	µg/L
Manganese	200.7	15	µg/L
Mercury	7470A	0.2	µg/L
Molybdenum	6020	10	µg/L
Nickel	6020	5	µg/L
Nitrate as nitrogen	300.0	1,000	µg/L
Nitrite as nitrogen	SM 4500	4	µg/L
Phosphate (total)	365.3	100	µg/L
Potassium	200.7	3,000	µg/L
Selenium	6020	10	µg/L
Silver	6020	5	µg/L
Sodium	200.7	10,000	µg/L
Strontium	200.7	500	µg/L
Sulfate	300.0	100.000	µg/L
Thallium	6020	10	µg/L
Total dissolved solids	SM 2540C	10,000	µg/L
Total alkalinity (as $CaCO_3$)	SM 2320B	100,000	µg/L
Vanadium	6020	5	µg/L
Zinc	6020	10	µg/L
pH	Field	+/- 0.1	pH units
Temperature	Field	+/- 0.1	° F or °C

b. Semi-annually, the groundwater potentiometric surface shall be illustrated on a 8.5" x 11" copy of a site plan showing the static water level, in feet below ground surface; the monitoring well locations; the location of the

surface impoundments; and the groundwater gradient under each surface impoundment.

c. Prior to sampling, each monitoring well shall be sufficiently purged in accordance with generally accepted sampling practices in order to obtain a representative ground water sample. If any monitoring well is dry for more than a year, a new or modified monitoring well shall be installed.

Groundwater samples must be collected after the wells have been purged in accordance with California Environmental Protection Agency guidance document, *Representative Sampling of Groundwater for Hazardous Substances*, revised February 2008 (see: http://www.dtsc.ca.gov/SiteCleanup/upload/SMP_Representative_Sampling_GroundWater.pdf). The required stability parameters and criteria from this guidance are summarized in Table II-4.

Table II-4
Stabilization Parameters and Criteria

Parameter	Criteria
temperature	± 3% of reading (minimum of ± 0.2 C)
pH	+/- 0.1
specific electrical conductance	+/- 3%
Oxidation-reduction potential	+/- 10 millivolts
dissolved oxygen	+/- 0.3 milligrams per liter

III. DATA ANALYSES

All data analyses methods (statistical or non-statistical) shall meet the requirements of CCR, title 27, section 20415, subdivision (e)(9).

A. General Non-statistical Methods

Evaluation of data will be conducted using non-statistical methods to determine if any new releases from the surface impoundments or land treatment unit have occurred. Non-statistical analysis shall be as follows.

1. Physical Evidence

Physical evidence can include dike or berm(s) damage or loss, unexplained volumetric changes in the surface impoundments, groundwater mounding, or soil discoloration. Each annual report shall comment on the absence or presence of physical evidence of a release.

2. Time Series Plots

Each annual report must include time series plot for groundwater monitoring parameters. Time series plots are not required for parameters that have never been detected above their method detection limit (as specified by the applicable USEPA Method) or if there are less than four quarters of data. Evidence of a

release may include trends of increasing concentrations of one or more constituent over time.

B. General Statistical Analysis Methods

For Detection Monitoring, the applicant shall use statistical methods to analyze the constituents of concern listed in Table 11-4 of this Monitoring and Reporting Program that exhibit concentrations that equal or exceed their respective method detection limit in at least ten percent of applicable historical samples. The applicant may propose and use any statistical method that meets the requirements of CCR, title 27, section 20415, subdivision (e)(7). The report titled "Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities" (USEPA, 1989) or subsequent versions may also be used to select the statistical test to use for comparing detection monitoring well data to background monitoring data. All statistical methods and programs proposed by the applicant are subject to CPM approval and must be in compliance with CCR, title 27.

IV. RECORD KEEPING AND REPORTING REQUIREMENTS

A. Scheduled Reports to be filed with the California Energy Commission

A detection monitoring report shall be submitted to the CPM of the California Energy Commission. The content of the detection monitoring report shall be as follows:

1. results of sampling analysis, including statistical limits or each monitoring point;
2. a description and graphical presentation of the velocity and direction of ground water flow under or around the Waste Management Units, based upon water level elevations taken during the collection of the water quality data submitted in the report;
3. a map or aerial photograph showing the locations of observation stations, monitoring points, and background monitoring points;
4. an evaluation of the effectiveness of the leachate collection and recovery system, and of the runoff/runon control facilities; and
5. a letter transmitting the essential points in each report, including a discussion of any requirement violations found since the last report was submitted, and describing actions taken or planned for correcting those violations. If the applicant has previously submitted a detailed time schedule for correcting requirement violations, a reference to the correspondence transmitting this schedule will be satisfactory. If no violations have occurred since the last submittal, this shall be stated in the letter of transmittal.

B. Unscheduled Reports To Be Filed

1. Release from the Surface Impoundments

   The applicant shall perform the procedures contained in this subsection whenever there is evidence of a release from the surface impoundments.

The applicant shall immediately notify the CPM verbally whenever a determination is made that there is physical or statistically significant evidence of a release (as determined in compliance with CCR, title 27, section 20164) from a surface impoundment. This verbal notification shall be followed by written notification via certified mail within seven days of such determination. Upon such notification, the applicant may initiate verification procedures or demonstrate that another source other than the Impoundment caused evidence of a release (see below). The notification shall include the following information:

a. the surface impoundment that may have released or be releasing wastewater;

b. general information including the date, time, location, and cause of the release;

c. an estimate of the flow rate and volume of waste involved;

d. a procedure for collecting samples and description of laboratory test to be conducted;

e. identification of any subsurface water bearing zone affected or threatened;

f. a summary of proposed corrective actions; and

   For statistically significant evidence of a release (as determined in compliance with CCR, title 27, section 20164) – monitoring parameters and/or constituents of concern that have indicated statistically significant evidence of a release from the surface impoundments; or

   For physical evidence of a release – physical factors that indicate physical evidence of a release.

2. Exceeding the Action Leakage Rate

   The applicant shall immediately notify the CPM verbally within twenty-four hours whenever a determination is made that there is a fluid volume in the LCRS sumps in excess of the Action Leakage Rates. This verbal notification shall be followed by written notification via certified mail within seven days of such determination. This written notification shall be followed by a technical report via certified mail within thirty days of such determination. The technical report shall describe the actions taken to abate the adverse condition, and shall describe any proposed future actions to abate the adverse condition.

3. Evaluation Monitoring

   Pursuant to California Water Code section 13267, subdivision (b), the applicant shall, within 90 days of verifying a release, submit to the CPM an amended Report of Waste Discharge proposing an evaluation monitoring program (CCR, title 27, sections 20420, subdivision (k)(5) and 20425). If applicant decides not to conduct verification procedures, or decides not to make a demonstration that a source other than the surface impoundments or

land treatment unit are responsible for the release, the release will be considered verified.

4. Preliminary Engineering Feasibility Study Report

   The applicant shall, within 180 days of verification of a release or detection, submit to the CPM a Preliminary Engineering Feasibility Study pursuant to CCR, title 27, section 20420, subdivision (k)(6), that shall contain either corrective action measures that could be taken to achieve background concentration or demonstrate that the waste management units are not the cause of the detection.

V. REPORTING REQUIREMENTS

A. General Provisions

The applicant shall comply with the "General Provisions for Monitoring and Reporting" which is attached to and made part of this Monitoring and Reporting Program.

B. Semi-Annual Report

Beginning on January 30, 2011, a Semi-annual Monitoring Report, including the preceding monitoring information, shall be submitted to the CPM. Subsequent semi-annual monitoring reports shall be submitted to the CPM by January 30 and June 30 of each year.

C. Annual Report

Beginning on June 30, 2011, and by June 30 of each year, the applicant shall submit an Annual Report to the CPM including the preceding information and with the following information:

a. Evidence that adequate financial assurance for closure, post-closure, and reasonably foreseeable releases is still in effect and may include a copy of the renewed financial instrument or a copy of the receipt for payment of the financial instrument;

b. evidence that the amount is still adequate or increase the amount of financial assurance by the appropriate amount if necessary, due to inflation, a change in the approved closure plan, or other unforeseen events; and

c. a review of the closure plan and a statement that the closure activities described are still accurate or an updated closure plan.

D. Data Analysis Report

The applicant shall, by **June 30 of every year**, submit to the CPM a Data Analysis Report as specified in Section III (Data Analysis) of this Monitoring and Reporting Program.

E. Electronic Submittal of Information

Pursuant to CCT title 23, section 3890, the applicant shall submit reports, including soil, vapor and water data, prepared for the purpose of subsurface investigation or remediation of a discharge of waste to land subject to Division 2 of Title 27 electronically over the internet to the State Water Resources Control Board's Geotracker system. This requirement is in addition to, and not superseded by, any other applicable reporting requirement.

GENERAL PROVISIONS FOR MONITORING AND REPORTING

1. SAMPLING AND ANALYSIS

a. All analyses shall be performed in accordance with the current edition(s) of the following documents:

   i. Standard Methods for the Examination of Water and Wastewater

   ii. Methods for Chemical Analysis of Water and Wastes, EPA

b. All analyses shall be performed in a laboratory certified to perform such analyses by the California State Department of Health Services or a laboratory approved by the CPM. Specific methods of analysis must be identified on each laboratory report.

c. Any modifications to the above methods to eliminate known interferences shall be reported with the sample results. The methods used shall also be reported. If methods other than EPA-approved methods or Standard Methods are used, the exact methodology must be submitted for review and must be approved by the CPM.

d. The applicant shall establish chain-of-custody procedures to insure that specific individuals are responsible for sample integrity from commencement of sample collection through delivery to an approved laboratory. Sample collection, storage, and analysis shall be conducted in accordance with an approved Sampling and Analysis Plan (SAP). The most recent version of the approved SAP shall be kept at the facility.

e. The applicant shall calibrate and perform maintenance procedures on all monitoring instruments and equipment to ensure accuracy of measurements, or shall insure that both activities will be conducted. The calibration of any wastewater flow measuring device shall be recorded and maintained in the permanent log book described in 2.b, below.

f. A grab sample is defined as an individual sample collected in fewer than 15 minutes.

g. A composite sample is defined as a combination of no fewer than eight individual samples obtained over the specified sampling period at equal intervals. The volume of each individual sample shall be proportional to the discharge flow rate at the time of sampling. The sampling period shall equal the discharge period, or 24 hours, whichever period is shorter.

2. OPERATIONAL REQUIREMENTS

a. Sample Results

   The applicant shall maintain all sampling and analytical results including: strip charts; date, exact place, and time of sampling; date analyses were performed;

sample collector's name; analyst's name; analytical techniques used; and results of all analyses. Such records shall be retained for a minimum of three years. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge, or when requested by the CPM.

b. Operational Log

An operation and maintenance log shall be maintained at the facility. All monitoring and reporting data shall be recorded in a permanent log book.

3. REPORTING

a. For every item where the requirements are not met, the applicant shall submit a statement of the actions undertaken or proposed which will bring the discharge into full compliance with requirements at the earliest time, and shall submit a timetable for correction.

b. All sampling and analytical results shall be made available to the CPM upon request. Results shall be retained for a minimum of three years. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge, or when requested by the CPM.

c. The applicant shall provide a brief summary of any operational problems and maintenance activities to the CPM with each monitoring report. Any modifications or additions to, or any major maintenance conducted on, or any major problems occurring to the wastewater conveyance system, treatment facilities, or disposal facilities shall be included in this summary.

d. Monitoring reports shall be signed by:

i. In the case of a corporation, by a principal executive officer at least of the level of vice-president or his duly authorized representative, if such representative is responsible for the overall operation of the facility from which the discharge originates;

ii. In the case of a partnership, by a general partner;

iii. In the case of a sole proprietorship, by the proprietor; or

iv. In the case of a municipal, state or other public facility, by either a principal executive officer, ranking elected official, or other duly authorized employee.

e. Monitoring reports are to include the name and telephone number of an individual who can answer questions about the report.

I. WATER QUALITY PROTECTION STANDARD

A Water Quality Protection Standard is required by Title 27 of the California Code of Regulations (CCR, title 27) to assure the earliest possible detection of a release from the Calico Solar Project (Calico) to underlying soil and/or groundwater. The Water Quality Protection Standard shall consist of the list of constituents of concern,

the concentration limits, the Point of Compliance and all Monitoring Points. This Water Quality Protection Standard shall apply during the operation, closure, post-closure maintenance period, and during any compliance period. Calico will initially undergo construction and then will be under a Detection Monitoring Program as documented in the August 2010 Report of Waste Discharge (August 2010 ROWD).

II. MONITORING

A. Flow Monitoring of Discharges to the Surface Impoundments (the two evaporation ponds)

The August 2010 ROWD states that discharge to the surface impoundments will consist of saline wastewater from the Project's water treatment system.

The Applicant shall monitor the following:

1. The volume, in gallons per day (gpm), of wastewater delivered to the surface impoundments;
2. The cumulative total of wastewater flow delivered to the surface impoundments, in million gallons per month; and
3. The maximum daily flow rate, in gpm, delivered to the surface impoundments each month.

B. Monitoring of Wastewater Discharges to the Surface Impoundments

Semi-annually, the Applicant shall record the following:

1. The sources of wastewater delivered to the surface impoundments;
2. The amount and types of chemical additives added to the water treatment system that may be discharged to the surface impoundments; and
3. The analytical results of a composite wastewater grab sample that shall be collected and analyzed for the parameters in Table II-1.

Wastewater Sampling Parameters
Table II-1

Parameter	U.S. EPA or Standard Method	Reporting Limit Goal	Units
Ammonia (as N)	350.1	100	µg/L
Aluminum	200.7	20	µg/L
Arsenic	6020	2	µg/L
Antimony	6020	10	µg/L
Barium	6020	5	µg/L
Beryllium	6020	2	µg/L
Boron	200.7	140	µg/L
Cadmium	6020	5	µg/L
Calcium	200.7	40,000	µg/L
Chloride	300.0	14,000	µg/L
Chromium (total)	6020	5	µg/L
Cobalt	6020	5	µg/L
Copper	6020	5	µg/L
Cyanide (total)	SM 4500	10	µg/L
Fluoride	300.0	500	µg/L
Iron	200.7	20	µg/L
Lead	6020	3	µg/L
Magnesium	200.7	10,000	µg/L
Manganese	200.7	15	µg/L
Mercury	7470A	0.2	µg/L
Molybdenum	6020	10	µg/L
Nickel	6020	5	µg/L
Nitrate as nitrogen	300.0	1,000	µg/L
Nitrite as nitrogen	SM 4500	4	µg/L
Phosphate (total)	365.3	100	µg/L
Potassium	200.7	3,000	µg/L
Selenium	6020	10	µg/L
Silver	6020	5	µg/L
Sodium	200.7	10,000	µg/L
Strontium	200.7	500	µg/L
Sulfate	300.0	100.000	µg/L
Thallium	6020	10	µg/L
Total dissolved solids	SM 2540C	10,000	µg/L
Total alkalinity(as CaCO3)	SM 2320B	100,000	µg/L
Vanadium	6020	5	µg/L
Zinc	6020	10	µg/L
pH	Field	+/- 0.1	pH units
Temperature	Field	+/- 0.1	° F or °C

µg/L = micrograms per liter

C. Surface Impoundment Monitoring

1. Dikes and Liners

   a. Daily, the freeboard shall be measured from the top of the lowest part of the dike to the wastewater surface. If the surface impoundment is dry, indicate that it is empty of wastewater.

   b. Monthly, the integrity of the dikes and liners shall be inspected. If the inspection indicate any damage to the dikes or liners or if an unauthorized discharge has occurred, or is likely to occur, the Energy Commission shall be notified within 48 hours, followed by confirmation in writing.

2. Leachate Collection and Removal System (LCRS)

   a. Weekly, visual inspection for liquid in the leachate collection detection sumps for each surface impoundment shall be conducted. The results of those inspections shall be recorded in a permanent log book.

   b. All volume of liquid pumped out of the leakage detection sumps for each surface impoundment shall be recorded along with date, time and discharge location, in a permanent log book kept on-site.

3. Surface Impoundment Wastewater Monitoring

   Semi-annually, at each surface impoundment, liquid grab samples shall be collected at three (3) sample locations in the surface impoundments spaced approximately equidistant. The collected samples shall be composited into one sample by the laboratory and analyzed to determine the quantification of the parameters in Table II-1.

4. Surface Impoundment Sludge Monitoring

   Annually, in the last quarter of each year, three (3) representative grab samples of the bottom sludge, if present, in each surface impoundment shall be collected, composited and analyzed for the parameters in Table II-2.

Surface Impoundment Sludge Monitoring
Table II-2

Parameters	Unit
CCR title 22 metals (CAM 17)- Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Mercury, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc	Milligrams per kilogram (mg/kg)

D. Detection Monitoring

Using approved statistical or non-statistical data analysis methods approved in these requirements, and in compliance with CCR, title 27, the Applicant shall, for each monitoring event, compare the concentration of each monitoring parameter with its respective concentration limit to determine if there has been a release from the surface impoundments. Monitoring shall be completed in compliance with this section as further described below.

1. Unsaturated Zone Monitoring - Neutron Probe

   a. Quarterly, the Applicant shall check for moisture below the surface impoundment liners using a neutron moisture probe calibrated for use at the site. If moisture content is detected above 30 percent by volume, field verification testing shall be performed and the Applicant shall notify the Energy Commission and report physical evidence of a release (see notification procedures below). Field verification testing may include a combination of additional neutron analysis, laboratory analysis of liquids drawn from the neutron probe casing and visual observation to verify existence of a release.

   b. Annually, the Applicant shall submit documentation of instrument calibration and performance checks. Performance checks shall be a comparison of quarterly results of neutron moisture.

2. Groundwater Monitoring

The Applicant proposed utilizing two existing groundwater wells west of the main services complex, noted as the Schraeger Well and Well #1, and installing one additional well southwest of the surface impoundments within the main services complex to comply with CCR title 27, section 20415. The two existing wells would serve as background wells and would be used to determine background groundwater quality and level. The Applicant is required to install a third well to be used to establish gradient and serve as both a detection and compliance well.

Groundwater flow direction has not been established with certainty. An additional groundwater monitoring well may be necessary after the third well is installed and the hydrogeological and water quality data from all three wells are evaluated.

a. Semi-annually, samples shall be collected from all of the wells in the groundwater monitoring network and analyzed for the parameters listed in Table II-3.

The results of the analysis shall be reported in the semi-annual report in tabular and graphical form. Each such graph shall be plotted with raw data at a scale appropriate to show trends or variations in water quality. For graphs showing the trends of similar constituents, the scale shall be the same. The data shall also be used to construct an Upper Tolerance Limit to determine evidence of a release and shall be used to evaluate data from the previous three quarters for evidence of a release.

Monitoring Well Sampling Parameters
Table II-3

Parameter	U.S. EPA or Standard Method	Reporting Limit Goal	Units
Ammonia (as N)	350.1	100	µg/L
Aluminum	200.7	20	µg/L
Arsenic	6020	2	µg/L
Antimony	6020	10	µg/L
Barium	6020	5	µg/L
Beryllium	6020	2	µg/L
Boron	200.7	140	µg/L
Cadmium	6020	5	µg/L
Calcium	200.7	40,000	µg/L
Chloride	300.0	14,000	µg/L
Chromium (total)	6020	5	µg/L
Cobalt	6020	5	µg/L
Copper	6020	5	µg/L
Cyanide (total)	SM 4500	10	µg/L
Fluoride	300.0	500	µg/L
Iron	200.7	20	µg/L
Lead	6020	3	µg/L
Magnesium	200.7	10,000	µg/L
Manganese	200.7	15	µg/L
Mercury	7470A	0.2	µg/L
Molybdenum	6020	10	µg/L
Nickel	6020	5	µg/L
Nitrate as nitrogen	300.0	1,000	µg/L
Nitrite as nitrogen	SM 4500	4	µg/L
Phosphate (total)	365.3	100	µg/L
Potassium	200.7	3,000	µg/L
Selenium	6020	10	µg/L
Silver	6020	5	µg/L
Sodium	200.7	10,000	µg/L
Strontium	200.7	500	µg/L
Sulfate	300.0	100.000	µg/L
Thallium	6020	10	µg/L
Total dissolved solids	SM 2540C	10,000	µg/L
Total alkalinity(as CaCO3)	SM 2320B	100,000	µg/L
Vanadium	6020	5	µg/L
Zinc	6020	10	µg/L
pH	Field	+/- 0.1	pH units
Temperature	Field	+/- 0.1	° F or °C

b. Semi-annually, the groundwater potentiometric surface shall be illustrated on an 8.5" x 11" copy of a site plan showing the static water level, in feet below ground surface; the monitoring well locations; the location of the surface impoundments; and the groundwater gradient under each surface impoundment.

c. Prior to sampling, each monitoring well shall be sufficiently purged in accordance with generally accepted sampling practices in order to obtain a representative ground water sample. If any monitoring well is dry for more than a year, a new or modified monitoring well shall be installed.

Groundwater samples must be collected after the wells have been purged in accordance with California Environmental Protection Agency guidance document, *Representative Sampling of Groundwater for Hazardous Substances*, revised February 2008 (see: http://www.dtsc.ca.gov/SiteCleanup/upload/SMP_ Representative_Sampling_GroundWater.pdf). The required stability parameters and criteria from this guidance are summarized in Table II-4.

Table II-4
Stabilization Parameters and Criteria

Parameter	Criteria
temperature	± 3% of reading (minimum of ± 0.2 C)
pH	+/- 0.1
specific electrical conductance	+/- 3%
Oxidation-reduction potential	+/- 10 millivolts
dissolved oxygen	+/- 0.3 milligrams per liter

III. DATA ANALYSES

All data analysis methods (statistical or non-statistical) shall meet the requirements of CCR, title 27, section 20415, subdivision (e)(9).

A. General Non-statistical Methods

Evaluation of data will be conducted using non-statistical methods to determine if any new releases from the surface impoundments have occurred. Non-statistical analysis shall be as follows.

1. Physical Evidence

Physical evidence can include dike or berm(s) damage or loss, unexplained volumetric changes in the surface impoundments, groundwater mounding, or soil discoloration. Each annual report shall comment on the absence or presence of physical evidence of a release.

2. Time Series Plots

Each annual report must include time series plots for groundwater monitoring parameters. Time series plots are not required for parameters that have never been detected above their method detection limit (as specified by the applicable USEPA Method) or if there are less than four quarters of data. Evidence of a release may include trends of increasing concentrations of one or more constituents over time.

B. General Statistical Analysis Methods

For Detection Monitoring, the Applicant shall use statistical methods to analyze the constituents of concern listed in Table II-3 of this Monitoring and Reporting Program that exhibit concentrations that equal or exceed their respective method detection limit in at least ten percent of applicable historical samples. The Applicant may propose and use any statistical method that meets the requirements of CCR, title 27, section 20415, subdivision (e)(7). The report titled "Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities" (USEPA, 1989) or subsequent versions may also be used to select the statistical test to use for comparing detection monitoring well data to background monitoring data. All statistical methods and programs proposed by the Applicant are subject to Energy Commission approval and must comply with CCR, title 27.

IV. RECORD KEEPING AND REPORTING REQUIREMENTS

A. Scheduled Reports to be filed with the Energy Commission

A detection monitoring report shall be submitted to the Energy Commission. The content of the detection monitoring report shall be as follows:

1. results of sampling analysis, including statistical limits or each monitoring point;

2. a description and graphical presentation of the velocity and direction of groundwater flow based upon water level elevations taken during the collection of the water quality data submitted in the report;

3. a map or aerial photograph showing the locations of observation stations, monitoring points, and background monitoring points;

4. an evaluation of the effectiveness of the leachate collection and recovery system, and of the runoff/runon control facilities; and

5. a letter transmitting the essential points in each report, including a discussion of any requirement violations found since the last report was submitted, and describing actions taken or planned for correcting those violations. If the Applicant has previously submitted a detailed time schedule for correcting requirement violations, a reference to the correspondence transmitting this schedule will be satisfactory. If no violations have occurred since the last submittal, this shall be stated in the letter of transmittal.

B. Unscheduled Reports To Be Filed

1. Release from the Surface Impoundments

The Applicant shall perform the procedures contained in this subsection whenever there is evidence of a release from the surface impoundments.

The Applicant shall immediately notify the Energy Commission verbally whenever a determination is made that there is physical or statistically significant evidence of a release (as determined in compliance with CCR, title 27, section 20164) from a surface impoundment. This verbal notification shall be followed by written notification via certified mail within seven days of such determination. Upon such notification, the Applicant may initiate verification procedures or demonstrate that another source other than the Impoundment caused evidence of a release (see below). The notification shall include the following information:

a. the surface impoundment that may have released or be releasing wastewater;
b. general information including the date, time, location, and cause of the release;
c. an estimate of the flow rate and volume of waste involved;
d. a procedure for collecting samples and description of laboratory test to be conducted;
e. identification of any subsurface water bearing zone affected or threatened;
f. a summary of proposed corrective actions; and

For statistically significant evidence of a release (as determined in compliance with CCR, title 27, section 20164) - monitoring

parameters and/or constituents of concern that have indicated statistically significant evidence of a release from the surface impoundments; or

For physical evidence of a release - physical factors that indicate physical evidence of a release.

2. Exceeding the Action Leakage Rate

The Applicant shall notify the Energy Commission verbally within twenty-four hours whenever a determination is made that there is a fluid volume in the LCRS sumps in excess of the Action Leakage Rates. This verbal notification shall be followed by written notification via certified mail within seven days of such determination. This written notification shall be followed by a technical report via certified mail within thirty days of such determination. The technical report shall describe the actions taken to abate the adverse condition, and shall describe any proposed future actions to abate the adverse condition.

3. Evaluation Monitoring

Pursuant to California Water Code section 13267, subdivision (b), the Applicant shall, within 90 days of verifying a release, submit to the Energy Commission an amended Report of Waste Discharge proposing an evaluation monitoring program (CCR, title 27, sections 20420, subdivision (k)(5) and 20425). If Applicant decides not to conduct verification procedures, or decides not to make a demonstration that a source other than the surface impoundments are responsible for the release, the release will be considered verified.

4. Preliminary Engineering Feasibility Study Report

The Applicant shall, within 180 days of verification of a release or detection, submit to the Energy Commission a Preliminary Engineering Feasibility Study pursuant to CCR, title 27, section 20420, subdivision (k)(6), that shall contain either corrective action measures that could be taken to achieve background concentration or demonstrate that the surface impoundments are not the cause of the detection.

V. REPORTING REQUIREMENTS

A. General Provisions

The Applicant shall comply with the "General Provisions for Monitoring and Reporting" which is attached to and made part of this Monitoring and Reporting Program.

B. Semi-Annual Report

Beginning on June 30, 2011, a Semi-annual Monitoring Report, including the preceding monitoring information, shall be submitted to the Energy Commission. Subsequent semi-annual monitoring reports shall be submitted to the Energy Commission by January 30 and June 30 of each year.

C. Annual Report

Beginning on January 30, 2012, and by January 30 of each year, the Applicant shall submit an Annual Report to the Energy Commission including the preceding information and with the following information:

a. Evidence that adequate financial assurance for closure, post-closure, and reasonably foreseeable releases is still in effect and may include a copy of the renewed financial instrument or a copy of the receipt for payment of the financial instrument;
b. Evidence that the amount is still adequate or increase the amount of financial assurance by the appropriate amount if necessary, due to inflation, a change in the approved closure plan, or other unforeseen events; and
c. a review of the closure plan and a statement that the closure activities described are still accurate or an updated closure plan.

D. Data Analysis Report

The Applicant shall, by **January 30 of every year**, submit to the Energy Commission a Data Analysis Report as specified in Section III (Data Analysis) of this Monitoring and Reporting Program.

GENERAL PROVISIONS
FOR MONITORING AND REPORTING

1. SAMPLING AND ANALYSIS

a. All analyses shall be performed in accordance with the current edition(s) of the following documents:

i. Standard Methods for the Examination of Water and Wastewater
ii. Methods for Chemical Analysis of Water and Wastes, EPA

b. All analyses shall be performed in a laboratory certified to perform such analyses by the California Department of Public Health or a laboratory approved by the Energy Commission. Specific methods of analysis must be identified on each laboratory report.

c. Any modifications to the above methods to eliminate known interferences shall be reported with the sample results. The methods used shall also be reported. If methods other than EPA-approved methods or Standard Methods are used, the exact methodology must be submitted for review and must be approved by the Energy Commission.

d. The applicant shall establish chain-of-custody procedures to insure that specific individuals are responsible for sample integrity from commencement of sample collection through delivery to an approved laboratory. Sample collection, storage, and analysis shall be conducted in accordance with an approved Sampling and Analysis Plan (SAP). The most recent version of the approved SAP shall be kept at the facility.

e. The applicant shall calibrate and perform maintenance procedures on all monitoring instruments and equipment to ensure accuracy of measurements, or shall insure that both activities will be conducted. The calibration of any wastewater flow measuring device shall be recorded and maintained in the permanent log book described in 2.b, below.

f. A grab sample is defined as an individual sample collected in fewer than 15 minutes.

g. A composite sample is defined as a combination of no fewer than eight individual samples obtained over the specified sampling period at equal intervals. The volume of each individual sample shall be proportional to the discharge flow rate at the time of sampling. The sampling period shall equal the discharge period, or 24 hours, whichever period is shorter.

2. OPERATIONAL REQUIREMENTS

a. Sample Results

The applicant shall maintain all sampling and analytical results including: strip charts; date, exact place, and time of sampling; date analyses were performed; sample collector's name; analyst's name; analytical techniques used; and results of all analyses. Such records shall be retained for a minimum of three years. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge, or when requested by the Energy Commission.

b. Operational Log

An operation and maintenance log shall be maintained at the facility. All monitoring and reporting data shall be recorded in a permanent log book.

3. REPORTING

a. For every item where the requirements are not met, the applicant shall submit a statement of the actions undertaken or proposed which will bring the discharge into full compliance with requirements at the earliest time, and shall submit a timetable for correction.

b. All sampling and analytical results shall be made available to the California Energy Commission upon request. Results shall be retained for a minimum of three years. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge, or when requested by the Energy Commission.

c. The applicant shall provide a brief summary of any operational problems and maintenance activities to the Energy Commission with each monitoring report. Any modifications or additions to, or any major maintenance conducted on, or any major problems occurring to the wastewater conveyance system, treatment facilities, or disposal facilities shall be included in this summary.

d. Monitoring reports shall be signed by:

i. In the case of a corporation, by a principal executive officer at least of the level of vice-president or his duly authorized representative, if such representative is responsible for the overall operation of the facility from which the discharge originates;
ii. In the case of a partnership, by a general partner;
iii. In the case of a sole proprietorship, by the proprietor; or
iv. In the case of a municipal, state or other public facility, by either a principal executive officer, ranking elected official, or other duly authorized employee.

e. Monitoring reports are to include the name and telephone number of an individual who can answer questions about the report.

WORKER SAFETY/FIRE PROTECTION

Staff's Additional Worker Safety and Fire Protection Testimony

The applicant has provided information post-hearing that includes a map showing the location of the two hydrogen generating facilities, hydrogen gas compressors, hydrogen gas piping, and access roads into and out of the various solar fields. After evaluation of this information, staff proposes the following addition to its testimony and to proposed condition **WORKER SAFETY-6**.

Due to the frequency and length of trains using the BMSF tracks, staff believes that an at-grade crossing of the rail road tracks would impede emergency response access to the northern portion of the site. Delay in response for fire suppression, rescue, or emergency medical needs would result in increased risk of fire escalation or los of life or limb to on-site workers. Staff therefore concludes that an overcrossing of the rail road tracks is required to ensure a timely emergency response.

Staff also notes that the map provided by the applicant does not show at least two roads into all portions of the site, one being an emergency access road. This second road is best located along or near the eastern fence line. Staff believes that an access road at this location, with an at-grade railroad crossing, to be used solely for emergency response, is necessary to ensure timely access to the northern solar fields, as well as the southern solar fields, should the main access road with the above-grade crossing be blocked or otherwise unavailable. Therefore, staff is proposing to require that this access be provided.

WORKER SAFETY-6 The project owner shall:

a. Provide ~~a~~ secondary access gates for emergency personnel to enter the southern and northern portions of the site. These secondary access gates shall be at least one-quarter mile from the primary access points and may be restricted to emergency response personnel.
b. Provide a second access road or roads that serve both the northern portion of the site and the southern portion of the site. This road(s) shall be at a minimum an all-weather gravel road, at least 20 feet wide, and with culverts to direct flow under the road at any wash the road may cross. The secondary emergency access road may cross the BNSF tracks at an at-grade crossing.
c. Maintain the main access road and the secondary access roads and provide a plan for implementation.
d. Provide an above-grade crossing of the BNSF tracks between the southern and northern portions of the site.

Plans for the secondary access gates, the method of gate operation, gravel secondary emergency access road(s), the above-grade crossing, and to maintain the roads shall be submitted to the San Bernardino County Fire Department for review and comment and to the CPM for review and approval.

Verification: At least thirty (30) days prior to the start of site mobilization, the project owner shall submit to the San Bernardino County Fire Department and the CPM preliminary plans showing the location and dimensions of the secondary access gates to both the southern and northern portions of the site, a description of how the gates will be opened by the fire department, and a description and map showing the location, dimensions, and composition of the main road, ~~the second gate~~ location of the secondary gravel emergency access road(s) to the southern and northern portions of the site, and the engineering drawings and precise location of the above-grade crossing structure. At least thirty (30) days prior to the start of site mobilization, the project owner shall submit final plans plus the road maintenance plan to the CPM review and approval. The final plan submittal shall also include a letter containing comments from the San Bernardino County Fire Department or a statement that no comments were received.