

CALIFORNIA ENERGY COMMISSION

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**ENERGY COMMISSION STAFF
MOTION TO
CORRECT EXHIBIT NUMBERS and
SUBMIT ADDITIONAL EXHIBITS 304 - 324**

**I. INTRODUCTION**

Energy Commission Staff has identified additional exhibits for introduction into the record. These exhibits fall into three categories:

1. Visual representations of testimony previously filed, which do not present new evidence, will expedite staff's presentation of evidence, and impose no burden or prejudice on the applicant or any other party;
2. Additional references to previously-submitted testimony, supporting declarations and curricula vitae, and;
3. Staff's responses to Applicant's proposed conditions of certification.

Staff also requests to re-number its exhibits in its Prehearing Conference Statement in the 300s, in accordance with the Committee's Notice of Prehearing Conference and Evidentiary Hearing and Order, dated December 21, 2012. The exhibits were inadvertently numbered in the 500s, which are assigned to intervenor Center for Biological Diversity.

This motion is proper under California Code of Regulations, title 20, section 1716.5. Introducing these exhibits will impose no prejudice on Applicant or any other party. Accordingly, Staff respectfully requests the Presiding Member exercise her authority under title 20, California Code of Regulations, section 1203(c), to allow Staff to introduce the exhibits numbered as 304-324, of which, 304-322 are attached hereto.

II. THE EXHIBITS OFFERED

It has been said a picture is worth a thousand words; such is the case here. After reviewing the record in light of the issues identified by the parties in their prehearing conference statements as remaining for adjudication, Staff has determined that its presentation of evidence would be facilitated by additional graphical exhibits, which are attached hereto.

These exhibits are described in detail below, and summarized in the following table:

Exhibit No.	Title	Description
300	Final Staff Assessment	Inadvertently numbered 500
301	Staff Rebuttal Testimony filed February 11, 2013	Inadvertently numbered 501
302	Staff Rebuttal Testimony filed February 15, 2013	Inadvertently numbered 502
303	Air District Determination of Compliance	Inadvertently numbered 503
304	Flux Density in 3-D: 50 kW/m ₂	Three- and two-dimensional representations of the volumes of airspace above the proposed Hidden Hills Solar Energy Generating Stations (HHSEGS), at or above the given solar flux levels, based on maps provided by the Applicant of solar flux isopleths.
305	Flux Density in 2-D: 50 kW/m ₂	
306	Flux Density in 3-D: 10 kW/m ₂	
307	Flux Density in 2-D: 10 kW/m ₂	
308	Flux Density in 3-D: 5 kW/m ₂	
309	Flux Density in 2-D: 5 kW/m ₂	
310	SEDC Satellite Image	Google Earth satellite image of Solar Energy Development Center (SEDC) facility, in Israel
311	HHSEGS Flux Field with SEDC and Avian Migrant Heights	Image from Appendix BIO 2, showing flux field at HHSEGS, with SEDC tower height and typical heights of avian migrant paths.
312	Curriculum Vitae: William E. Haas	Statements of qualifications and declarations supporting testimony of Staff witness
313	Declaration of William E. Haas	
314	Curriculum Vitae: Carolyn Chainey-Davis	
315	Declaration of Carolyn Chainey-Davis	
316	Curriculum Vitae: Alvin Greenberg	
317	Declaration of Alvin Greenberg	
318	Declaration of Rick Tyler	
319	Declaration of Geoff Lesh	
320	Staff Rebuttal: Revised Conditions of Certification, BIO 18 - 23	Revised conditions in response to Applicant's proposals, in the areas of Noxious Weeds, Special-status Plants, Waters of the State, and Groundwater-Dependent Ecosystems
321	Distance – Drawdown Plot	Plot of Applicant and Staff's proposed action threshold for groundwater drawdown, measured from the production well
322	Northern Production Well and Conceptual Monitoring Well Network	Plot of production and monitoring wells

323	A. Raspet, Biophysics of Bird Flight, Science, July 22, 1960, pp. 191 – 200	Additional references for Staff Appendices Bio 1 and Bio 2.
324	Patrick F. Mish, Mean Loading and Turbulence Scale Effects on the Surface Pressure Fluctuations Occurring on a NACA 0015 Airfoil Immersed in Grid Generated Turbulence, MS Thesis in Aerospace Engineering, Virginia Polytechnic Institute and State University, May 24, 2001	Additional references for Staff Appendices Bio 1 and Bio 2.

A. Exhibits 300 – 303

Staff requests to re-number its exhibits previously identified in its Prehearing Conference Statement in the 300s, in accordance with the Committee’s Notice of Prehearing Conference and Evidentiary Hearing and Order, dated December 21, 2012. The exhibits were inadvertently numbered in the 500s, which are assigned to intervenor Center for Biological Diversity.

B. Exhibits 304 - 309: The Flux Volume Maps

The Applicant previously produced maps of the variations of the solar flux in a representative 250 MW solar power tower unit like that proposed to be built at HHSEGS, with, for example, flux isopleth lines at 5, 10, 25, 50, 100 and 150 kW/m². Staff used these maps to create visual representations of the airspace at or above flux levels of 5, 10 and 50 kW/m², in two and three dimensions, numbered 304 – 309, respectively. The isopleths are not linear, and thus the volumes bounded by the isopleth lines are not uniform. This is difficult to describe in words, but readily apparent from the maps. Introducing these exhibits will greatly expedite testimony, and impose no prejudice on the Applicant.

C. Exhibits 310 - 311: SEDC Images

The Applicant previously produced an image of its proposed HHSEGS facility. The Applicant has made numerous arguments about the potential impacts of the HHSEGS facility in comparison with its SEDC facility. To illustrate these contentions, and Staff’s evaluation of them, Staff obtained a publicly-available satellite image of the SEDC facility, numbered 310.

Staff also added to an image of the HHSEGS flux fields, from Appendix Bio 2, the heights of the tower at the SEDC facility, and the typical minimum heights of North American diurnal avian migrants, numbered 311.

Introducing these exhibits will greatly expedite testimony, and impose no prejudice on the Applicant.

D. Exhibits 312 – 319: Statements of Qualifications and Declarations

As requested by Applicant, Staff submits statements of qualifications (i.e., resumes and curricula vitae) and declarations supporting testimony of Staff’s witnesses William E. Haas, Carolyn Chainey-Davis, and Alvin Greenberg. Also, two staff witnesses (Rick Tyler and Geoff Lesh) have amended their declarations to reflect additional testimony. These exhibits were inadvertently omitted in previous filings. Introducing these exhibits numbered 312 - 319 will greatly expedite testimony, and impose no prejudice on the Applicant.

E. Exhibit 320: Revised Conditions BIO 18 – 23

The Applicant previously suggested changes to proposed Conditions of Certification BIO 18 – 23, on the topics of Noxious Weeds, Special-status Plants, Waters of the State, and Groundwater-Dependent Ecosystems. Staff has evaluated these proposals, and suggests changes in response in Exhibit 320. Introducing this exhibit will greatly expedite testimony and further resolution of disputed issues, and impose no prejudice on the Applicant

F. Exhibits 321 – 322: Distance – Drawdown and Well Plot

Staff prepared two plots related to ground water. The first is a Distance – Drawdown Plot, showing Applicant and Staff’s proposed action threshold for groundwater drawdown, measured from the production well. The second is a plot of the Northern production well and a conceptual monitoring well network. These exhibits, numbered 321 – 322, graphically represent data previously introduced. No new information is presented. Introducing these exhibits will greatly expedite testimony, and impose no prejudice on the Applicant.

G. Exhibits 323 – 324: Additional References to Appendices Bio 1 and 2

Staff has identified additional references for its Appendices Bio 1 and Bio 2, numbered 323 and 324. These are two scientific papers, and are readily available from their sources (i.e., Science Magazine and Virginia Polytechnic) and other commonly-available technical literature sources, such as libraries. Introducing these exhibits will impose no prejudice on the Applicant.

III. STAFF AND APPLICANT HAVE MET AND CONFERRED

Staff and the Applicant have met and conferred regarding the potential to introduce additional exhibits. Applicant has agreed in principle that additional exhibits may be introduced, so long as any party may do so by March 1, 2013, and all parties have an

opportunity to review and object to the proposed exhibits. Applicant and Staff propose discussing this motion and related issues at the Prehearing Conference on February 26, 2013.

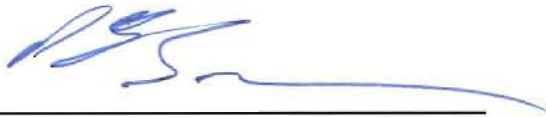
IV. CONCLUSION

Staff has a right to introduce evidence and exhibits. The Presiding Member may order the proceedings and allow introduction of evidence. The exhibits Staff seeks to introduce here reflect evidence in the record, and would not impose any prejudice on the Applicant. The Presiding Member should grant Staff's motion; a proposed order is attached for the convenience of the Presiding Member.

V. DECLARATION

I declare, under penalty of perjury of the laws of the State of California, that the foregoing is true and correct.

Executed on February 25, 2013, in Sacramento, California.



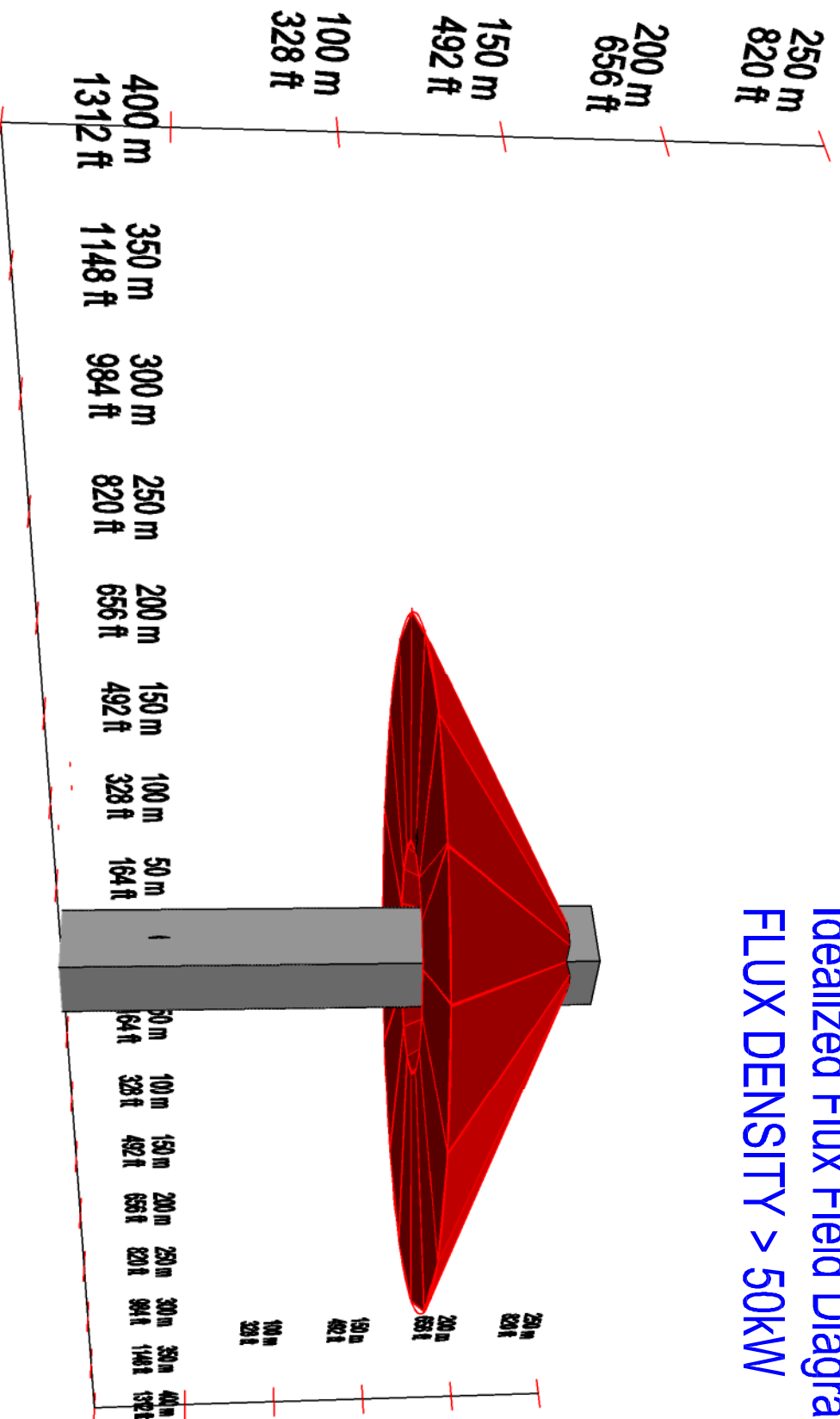
Richard C. Ratliff, Staff Counsel IV
Pippin C. Brehler, Senior Staff Counsel
Kerry Willis, Senior Staff Counsel
California Energy Commission

Exhibit 304

Hidden Hills SEGS

Idealized Flux Field Diagram

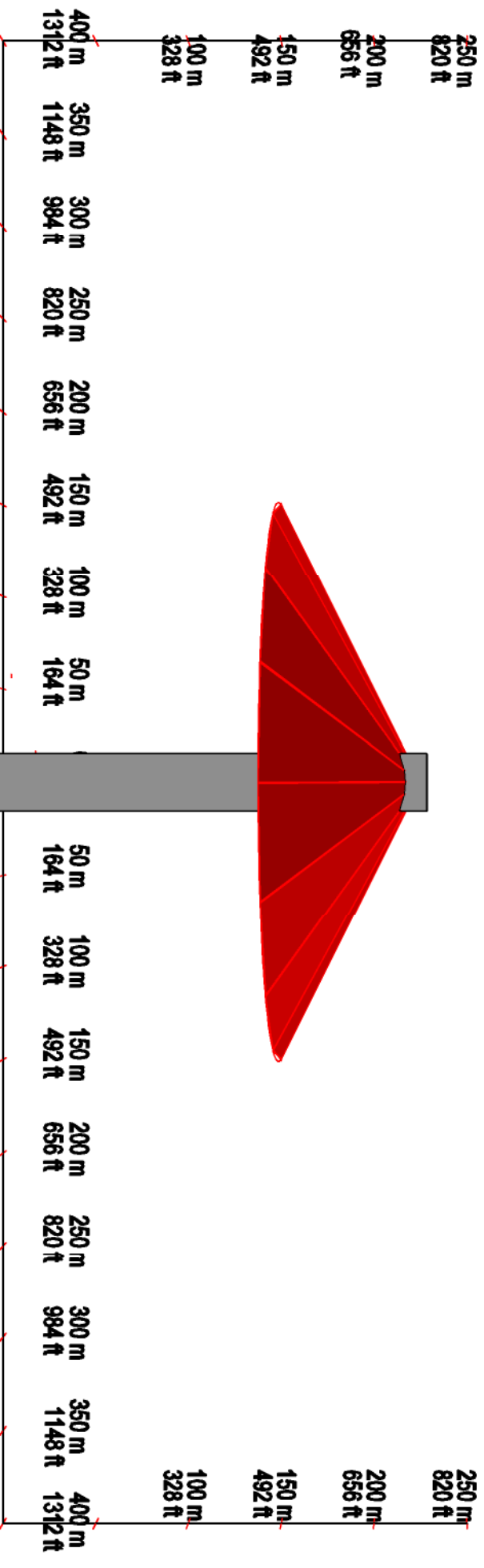
FLUX DENSITY > 50kW



50 kW PERSPECTIVE (HESEGS22FEB13)

Exhibit 305

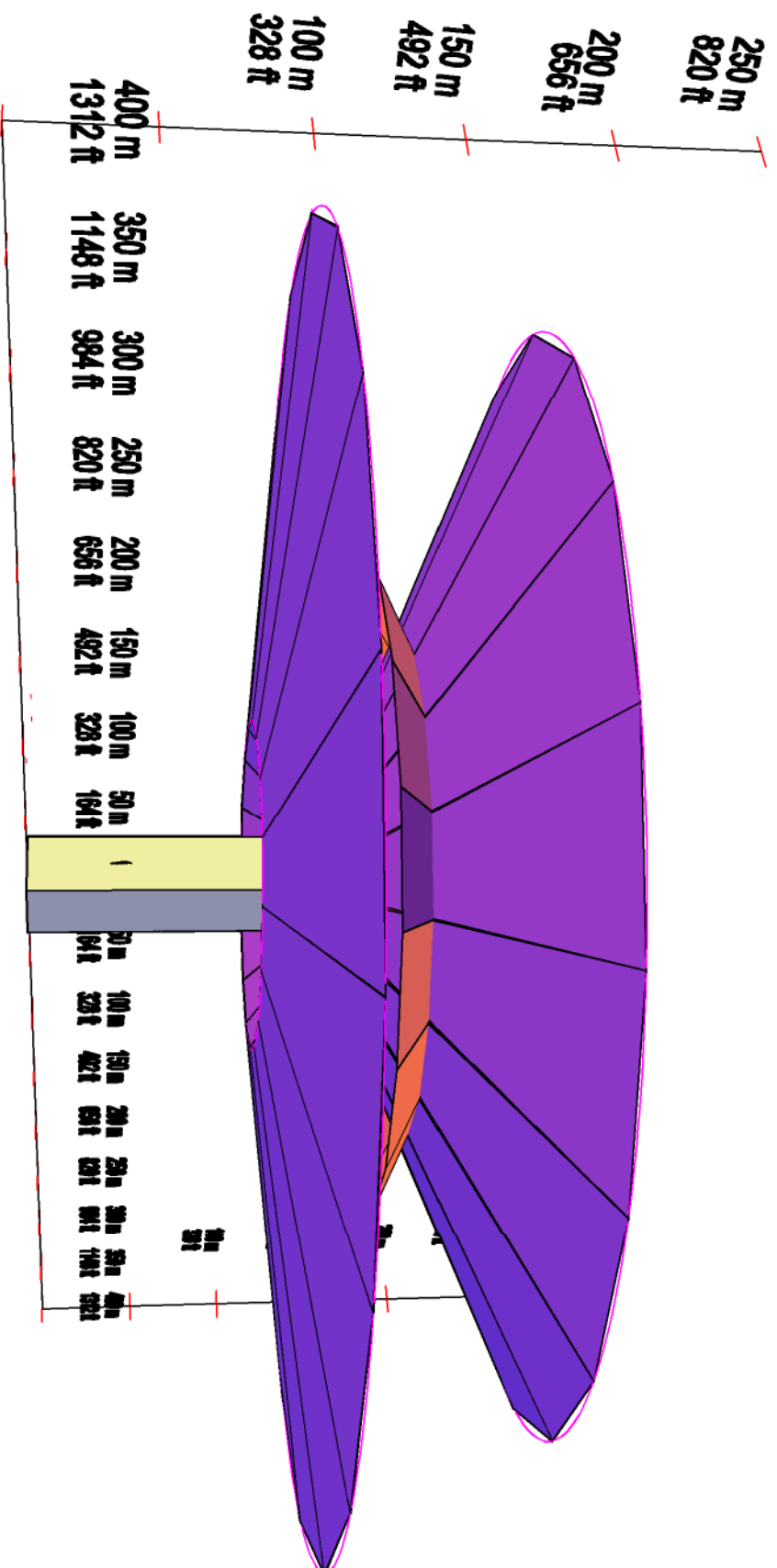
Hidden Hills SEGS Idealized Flux Field Diagram FLUX DENSITY > 50kW



50 kW ELEVATION (HESEGS22FEB13)

Exhibit 306

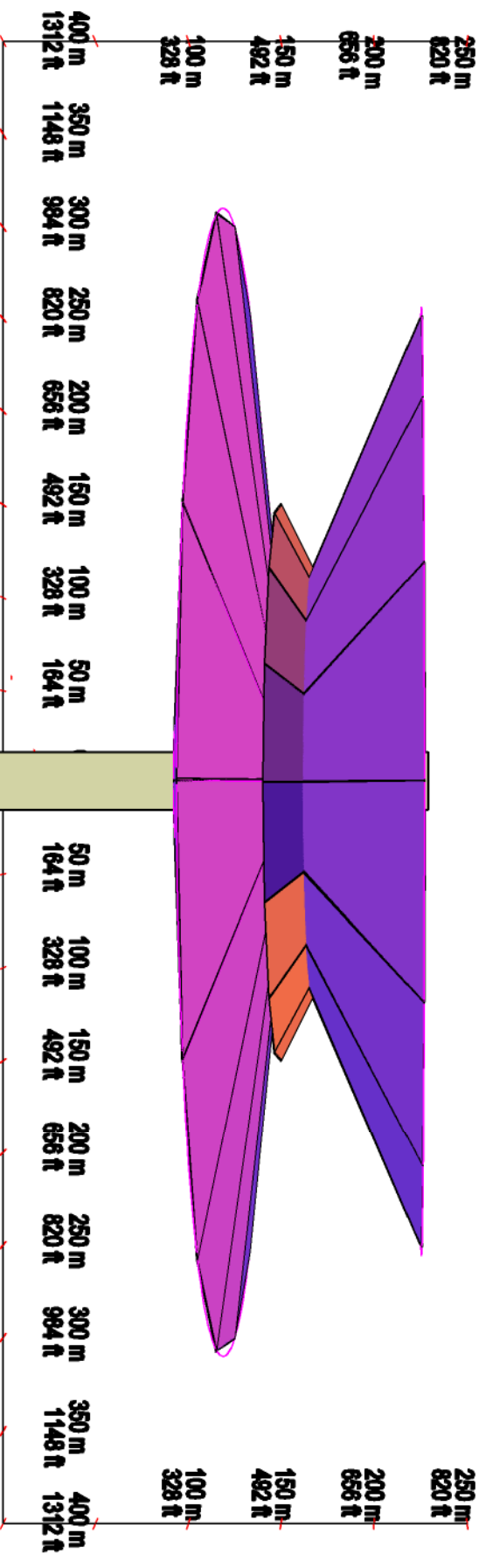
Hidden Hills SEGS Idealized Flux Field Diagram FLUX DENSITY > 10kW



10 kW PERSPECTIVE (HESEGS22FEB13)

Exhibit 307

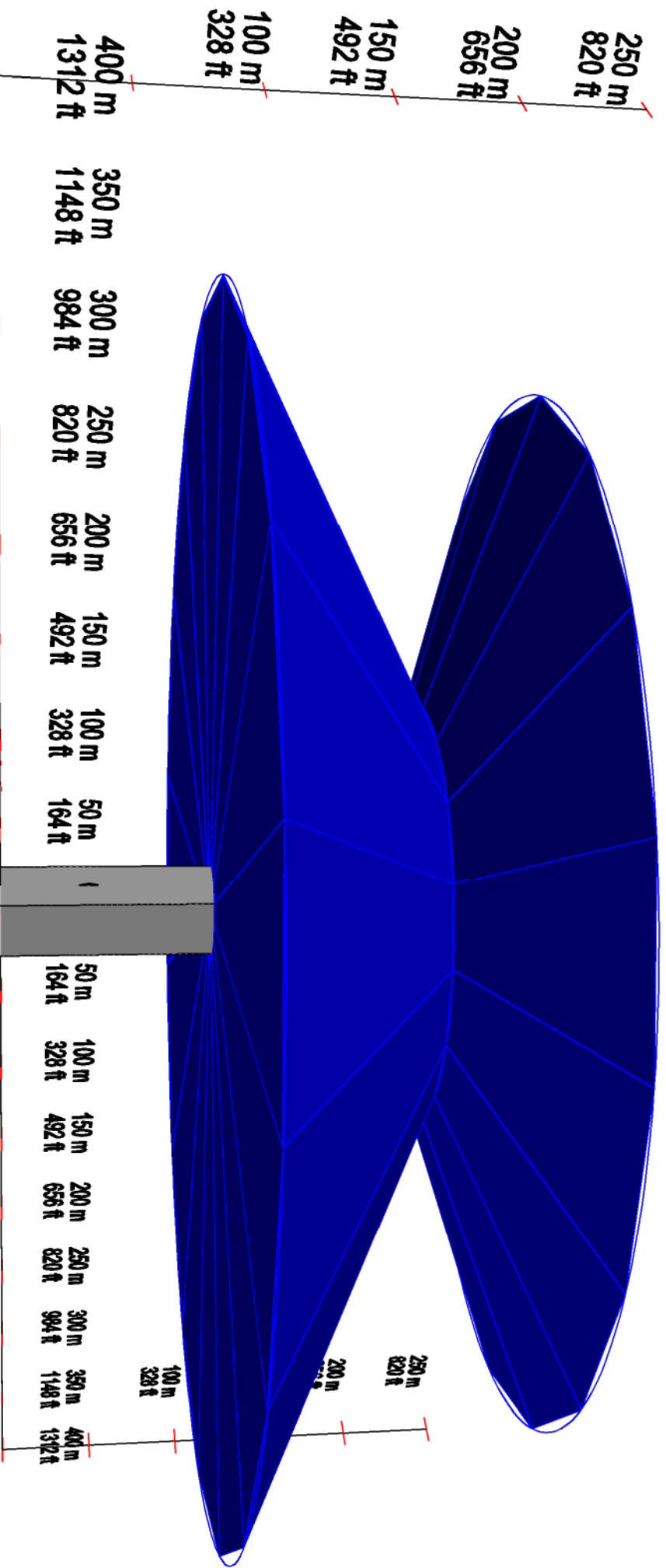
Hidden Hills SEGGS Idealized Flux Field Diagram FLUX DENSITY > 10kW



10 kW ELEVATION (HSEGS22FEB)

Exhibit 308

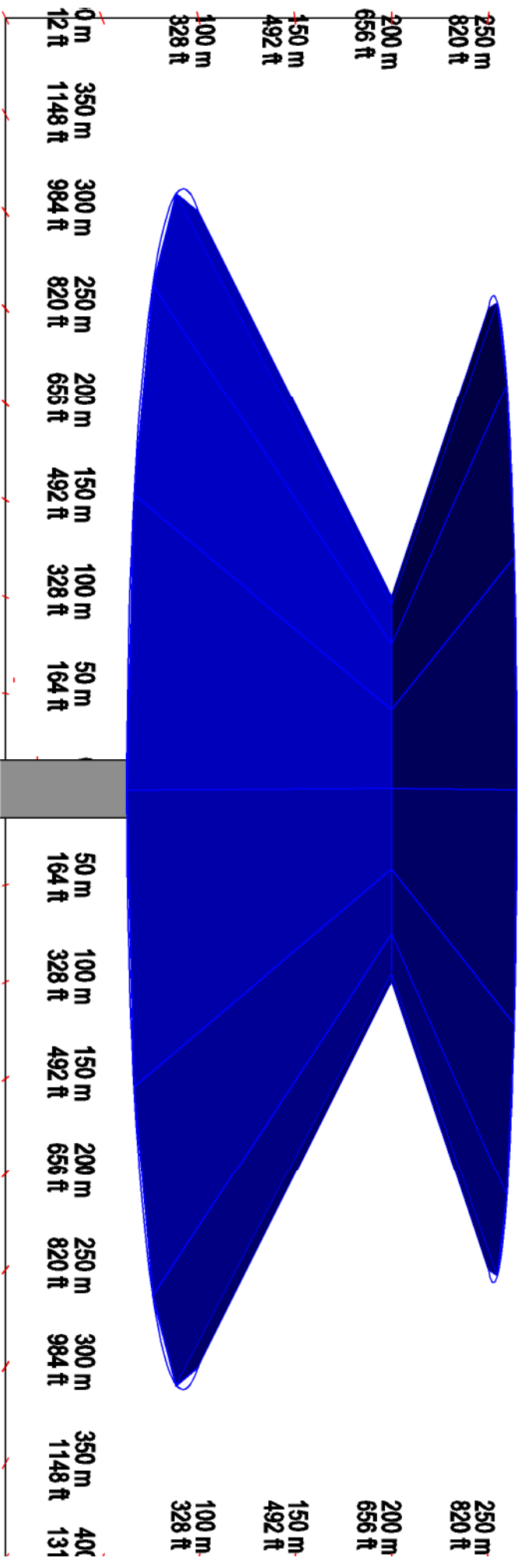
Hidden Hills SEGS Idealized Flux Field Diagram FLUX DENSITY > 5KW



5 kW PERSPECTIVE (HESEGS22FEB13)

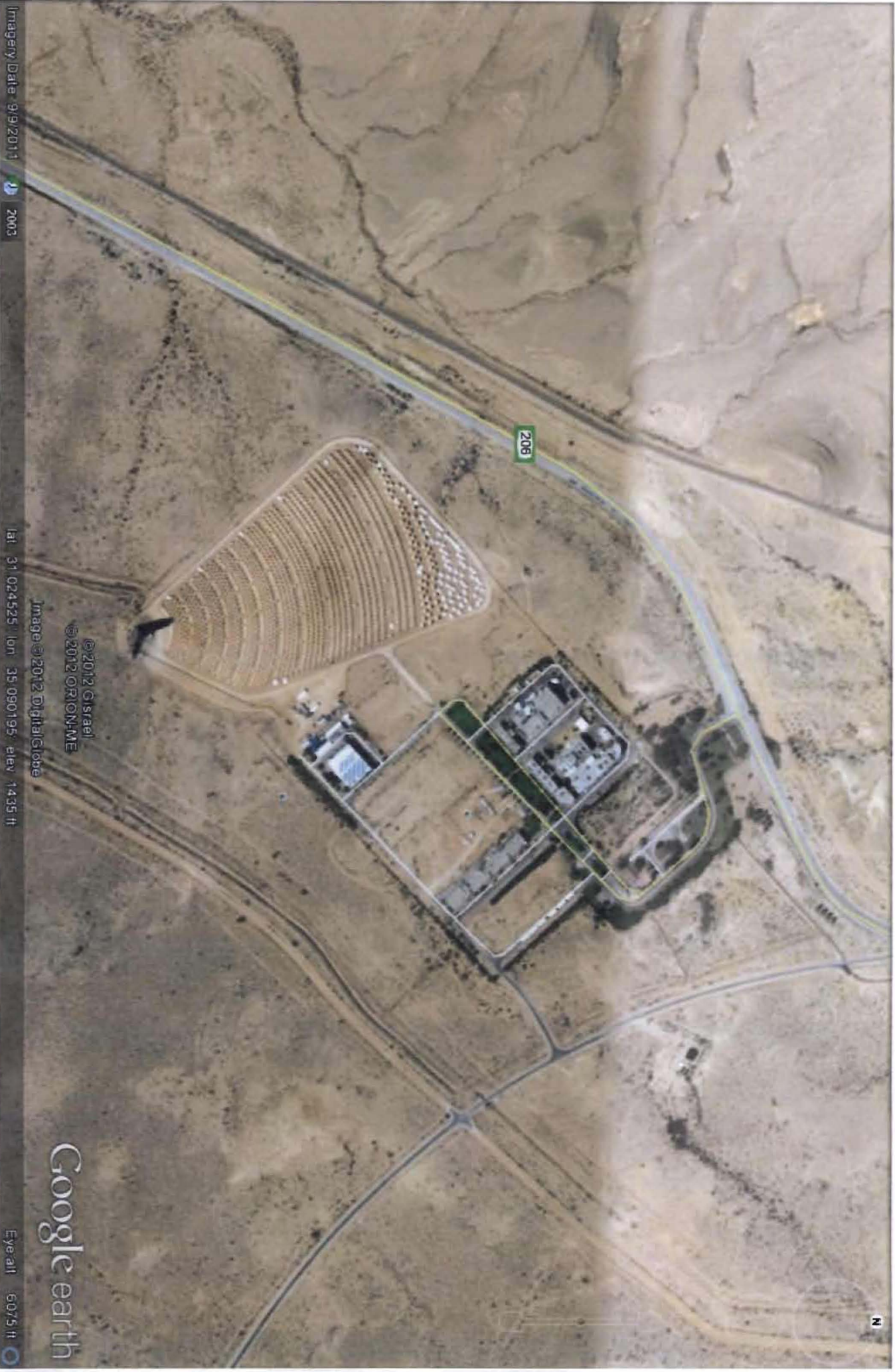
Exhibit 309

Hidden Hills SEGS Idealized Flux Field Diagram FLUX DENSITY > 5KW



5 kW ELEVATION (HESEGS22FEB13)

Exhibit 310



Imagery Date: 8/9/2011

2003

lat: 31.024525 lon: 35.090195 elev: 1435 ft

©2012 GIsrael
@2012 ORION-NE
Image ©2012 @globeGlobe

Google earth

Eye alt: 60.75 ft

Exhibit 311

Appendix Bio Figure A

Hidden Hills Solar Electric Generating System (HHSEGS) - Full load with 0% standby

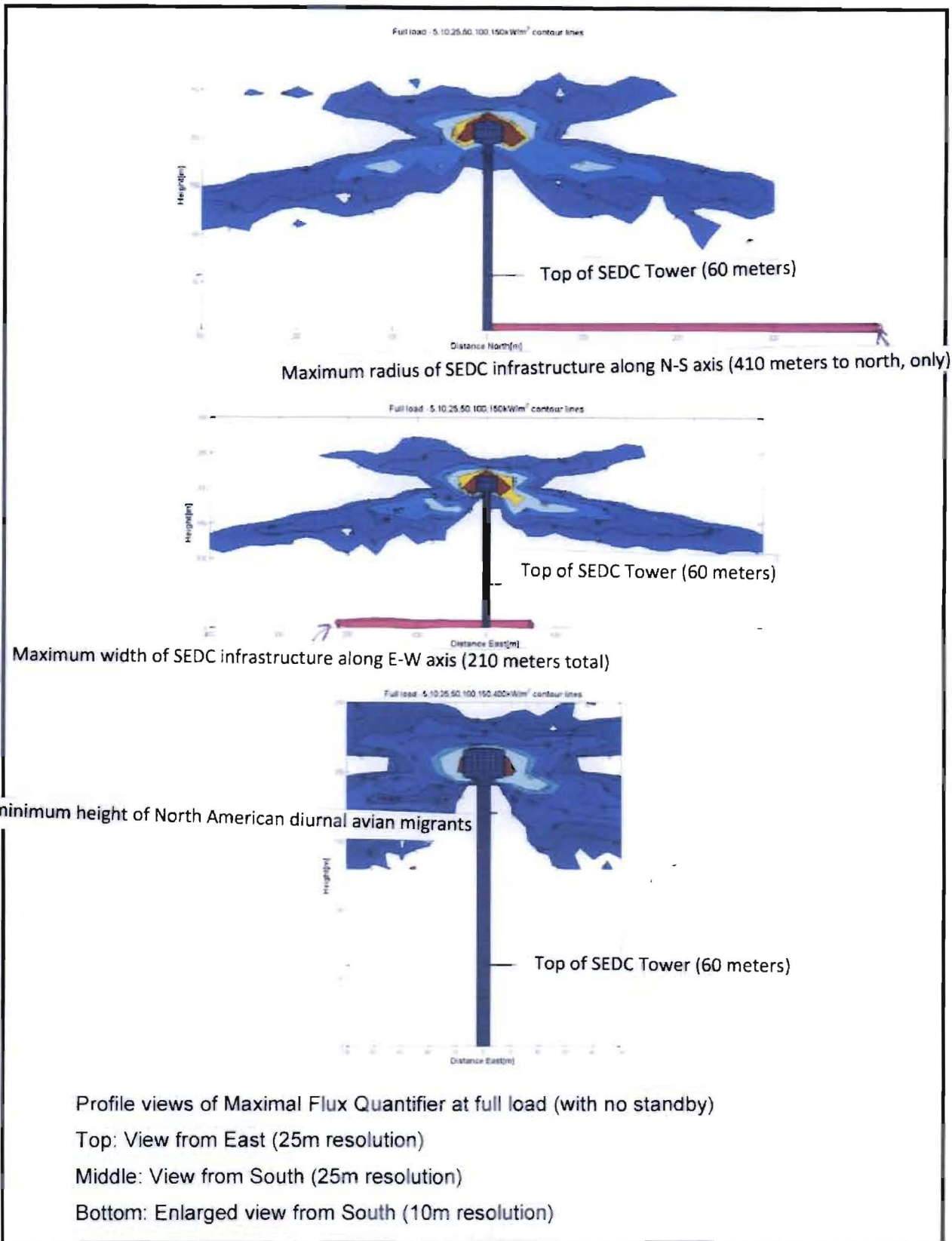


Exhibit 312

CURRICULUM VITAE: WILLIAM E. HAAS

PROFESSIONAL SUMMARY

With a richly varied background spanning more than 40 years of field and museum experience in species identification and the design and practice of general vertebrate field studies-including pitfall trapping (for reptiles, amphibians, and small mammals); mist netting (for birds and bats); SonoBat, Anabat, and radar-based surveys (for birds and bats); and small mammal live trapping-Haas is now responsible for the planning and implementing long-term management and population monitoring of numerous conservation properties, perpetual management areas, wildlife preserves, and military installations. He has developed additional expertise in preparing baseline assessments and developing long-term monitoring plans, writing management plans, preparing property analysis records (PARs), and authoring conservation easements for preserves and other mitigation lands in addition to supervising a staff of biologists who conduct biological studies and field research in California, Nevada, Arizona, and New Mexico.

Between 1972 and 1984, Haas spent more than ten years abroad studying the ecology and natural history of tropical avifauna and herpetofauna in Mexico, the Greater Antilles, and Central America. Since relocating to the U.S. in 1984, his studies have focused on several of southern California's rarest, most sensitive species. Considered an authority on the biology and ecology of federal endangered southwestern willow flycatcher (*Empidonax traillii extimus*), the federal threatened California gnatcatcher (*Polioptila californica*), and the federal endangered arroyo toad (*Anaxyrus californicus*), in 2003 Haas founded the Pacific Coast Conservation Alliance, a public benefit 510(c)(3), that is dedicated to the study of endangered and threatened species of the western United States as well as the conservation and preservation of the lands and habitats in which they reside.

EDUCATION

BA Biology; Harvard College, Cambridge, Massachusetts
MA EMST; University of California, Berkeley, California

PERMITS

U.S. Fish & Wildlife Service Permit TE-779910 to survey, locate, and monitor nests and color band Coastal California Gnatcatcher and Southwestern Willow Flycatcher; to survey, locate and monitor nests of Least Bell's Vireo; to capture, mark (PIT tag), and release Arroyo Toad.

U.S. Geological Survey Master (Bird) Banding Permit #22761

California Department of Fish & Game Permit #801015-07 to capture for study by mean of pitfall traps, live traps, mist net, or other methods reptiles, amphibians, mammals and birds in San Diego, Imperial, Riverside and Orange Counties.

CURRENT POSITIONS

I. Senior Biologist, Aspen Environmental Group: Responsible for conducting field surveys for endangered and threatened species; the design, development, and critique of biological field studies; and evaluating the effects of projects (both construction and operation) on common and

sensitive wildlife. Mr. Haas has specific experience evaluating the effects of large scale energy and infrastructure projects including solar, electrical transmission, and water storage.

II. Founder and Executive Director of the Pacific Coast Conservation Alliance (PCCA), a 501(c)(3) (non-profit) corporation: Responsible for the design and practice of field studies of endangered and threatened species in order to further their survivorship; management of conservation lands in an environmentally and biologically sound manner; and the design and all support services involved in developing wildlife and open space preserves, including performance of baseline surveys; authorship of preserve documents; determination of in-perpetuity management needs and costs, and investment of endowment funds.

RESEARCH POSITIONS

I. Curatorial Assistant, Departments of Herpetology and Ornithology, Museum of Comparative Zoology, Harvard University, Cambridge, MA (1971 – 1976)

II. Research Associate, Departments of Herpetology and Birds and Mammals, San Diego Natural History Museum, Balboa Park, San Diego, CA (1996 – 2005)

RESOURCE ASSESSMENT

San Diego River Watershed, San Diego County, California

Principal investigator for 6-year study of the effects of water release regimes on the federal endangered arroyo toad and the California species of special concern Coast Range newt (*Taricha torosa torosa*) for the Helix Water District. The study design incorporated studies within control and impact regions within the watershed to assess the effects of water release regimes that differed in every year of the study. Study components included not only surveys for focus species but also water sampling (flow rates, dissolved oxygen content, determination of sediment quotients, changes in temperature, etc.), documenting effects of feral swine, and sensitive species surveys as warranted in accordance with study area habitats. The study purpose was to determine not only the effects of water releases on the focus species but also to determine best management practices including optimum release regimes as well as appropriate mitigation and adaptive management strategies when applicable. (2005 – 2011)

Ocotillo Wells/Salton City, Imperial County, California

Designer and Principal Investigator for an intensive study of the avifauna at the 15-section Freeman Ranch (aka Truckhaven Hills) property on behalf of the California Department of Parks and Recreation, Ocotillo Wells State Vehicle Recreation Area. The study was designed to document avian occurrence during four important periods: Winter, spring migration, breeding season, and fall migration. Responsibilities were to implement a statistically defensible study design that could evaluate species occurrence; species richness, abundance, and other measures of diversity; and population densities in order to determine and assign relative wildlife value of each of the 15 sections. Focus species within the study scope included the burrowing owl (*Athene cunicularia*) and the Le Conte's thrasher (*Toxostoma lecontei*). (2008 - 2009)

Marine Corps Air Station Miramar, San Diego County, California

Designer and Principal Investigator for the station-wide study to determine the distribution and population density of the California gnatcatcher on the 24,000-acre Marine Corps Air Station. Supervising a staff of four biologists, the effectiveness of the survey was the result not only of a rich knowledge of the species and its historic occurrences on the station but also a high level of

familiarity with the station, its history and operations (including recent fire history), its habitats, and its geomorphology. (2009)

Marine Corps Air Station Miramar, San Diego County, California

Principal Investigator and Design Coordinator for Miramar's long-term ecosystem monitoring program. Designed and implemented the initial (baseline) assessment and monitoring program in 1998-1999 to investigate impacts of military training on natural lands. Responsible subsequently for database management, design updates, and implementation of the bird, reptile, amphibian, small mammal, large mammal, and bat study components including the development of diversity assessment and updating of monitoring methods; choosing study sites; establishing and writing repeatable protocols; and instruction and supervision of field personnel. Sixteen trapping locations were established for the fixed trap location reptile, amphibian, and small mammal study components. An additional 80 use area grids were established to study bird occurrence, population densities, and diversity. The monitoring project focuses on comparisons between use area and control sites throughout the Air Station to document vertebrate population trends over an extended time period as they relate to the training mission and natural resource management responsibilities at the Marine Corps Air Station. (1998 - 2009)

Indian Canyons, Palm Springs, Riverside County, California

Designer and Principal Investigator for a 3-year study of riparian birds in the Agua Caliente Reservation Indian Canyons Preserve to a) assess occurring sensitive desert riparian bird species and b) to prepare a simple predictive model of habitat use in order to facilitate management of tribal lands. Designed and implemented the initial (baseline) assessment and monitoring program (1998-1999) to investigate impacts of military training on natural lands. Responsible for design and implementation of bird, reptile, amphibian, small mammal, large mammal, and bat study components including the development of assessment and monitoring methods; choosing study sites; establishing and writing repeatable protocols; and instruction and supervision of field personnel. The monitoring project focuses on comparisons between use area and control sites throughout the Air Station to document vertebrate population trends over an extended time period as they relate to the training mission and natural resource management responsibilities at the Marine Corps Air Station. (1998 - 2009)

San Pasqual Valley, San Diego County, California

Principal Investigator for a multi-organization study of the Southern Cottonwood Willow Riparian Forest and associated uplands for the City of San Diego, the Joint Powers Authority, and the San Dieguito River Park. Focus of the study was the assessment of occurrence and development of a habitat management plan that addressed the conservation of the least Bell's vireo (*Vireo bellii pusillus*), southwestern willow flycatcher, yellow-breasted chat (*Icteria virens*), and arroyo toad as well as control of the nest parasite brown-headed cowbird (*Molothrus ater*). Management issues include compatibility of wildlife with existing agriculture, mineral extraction, and proposed trail construction. Additional studies included the evaluation of a proposal to remove the invasive exotic giant reed (*Arundo donax*) from Santa Ysabel and Santa Maria Creeks. (1998 - 2005)

San Diego County, California

In addition to conducting more than 100 one-day surveys in support of the San Diego County Bird Atlas at a broad assortment of locations and habitats, from the Pacific coast to the Anza-Borrego desert, I was responsible for designing and overseeing the owl survey component of this 5-year study. The atlas project (Unitt 2004) is one of the most comprehensive survey efforts relating to the natural history and distribution of North American birds. As a result, I was also responsible for authoring or co-authoring several of the species accounts including those for the long-eared owl

(*Asio otus*), spotted owl (*Strix occidentalis*), willow flycatcher, California gnatcatcher, black-throated gray warbler (*Setophaga nigrescens*), and Cassin's vireo (*Vireo cassinii*). (1997 – 2003)

San Felipe Valley, San Diego County, California

Principal Investigator and Design Coordinator for the bird, reptile, amphibian, small mammal, and bat components and co-principal investigator for mammal studies for the baseline assessment project of the California Department of Fish and Game in San Felipe Valley, San Diego County. The study sites included one 400-acre and one 750-acre parcel in possibly the most important overland avian migratory route in San Diego County as well as an area of intergrade for numerous coastal, desert and montane vertebrate species. The studies are based on data gathered from pitfall trap, small mammal live trap, mist-netting, and Anabat studies as well as visual encounter surveys. Responsibilities include data collection, subsequent development of management plan relating to recreational (e.g., hunting, hiking trails), and protection of biological resources (focusing specifically on the state-listed Species of Special Concern). (1998 - 2002)

Naval Air Station Miramar, San Diego, California

Study designer and Principal Investigator for a three-year station-wide (24,000-acre) reptile and amphibian survey investigating reptile and amphibian use of major habitats present on the Naval Air Station with special emphasis on vernal marsh, southern coast live oak riparian forest, and coastal sage scrub associations. Target species for intensive studies included three California Department of Fish & Game species of special concern: western spadefoot (*Spea hammondi*), orangethroat whiptail (*Aspidoscelis hyperythra*), and coast horned lizard (*Phrynosoma coronatum*). The overall goal of the study is to provide the Department of the Defense (U. S. Marine Corps) with information about comparative population densities of each resident species by habitat in order to facilitate future planning and land use on the station. (1995 to 1998)

Mission Trails Regional Park/Camp Elliott, San Diego, California

Supervising Biologist for a 5-year ordnance removal project - a joint venture between Mission Trails Regional Park, the City of San Diego, and the Army Corps of Engineers. Responsible for writing and implementing Biological Monitoring Protocols and the Field Safety Program for the first ordnance removal project conducted on non-federal lands in the U.S. Responsibilities included oversight of four biological monitors; sensitive species surveys and monitoring of 10 sensitive and/or listed plants and animals - including the federal endangered San Diego mesa mint (*Acanthomintha ilicifolia*), federal endangered least Bell's vireo (*Vireo bellii pusillus*), and federal threatened California gnatcatcher - during ordnance search and removal; and phasing of activities to maximize avoidance of impacts to sensitive species. (1990 – 1995)

Note: Complete (extensive) list of all, especially smaller scope, limited-effort, and short-term surveys and projects, are not included in this summary but may be made available on request or as necessary.

LONG-TERM ENDANGERED/THREATENED SPECIES RESEARCH

- CALIFORNIA GNATCATCHER (FT, CSSC)

1990 to present – Responsible for numerous long-term gnatcatcher studies to address habitat use, (meta-) population size changes, and response to wildfire by means of capture and color-marking as well as intensive, multi-observer survey techniques. Studies included focused data collection to assess the effects of noise on gnatcatcher breeding success, factors affecting and the timing of juvenile dispersal, large-scale movements of individuals, and more intricate studies to determine whether gnatcatchers move between established reserves; within and through inland archipelagos

of preserved lands; and their ability to cross major thoroughfares including a major interstate highways. Supporting these study goals were repeated surveys of large areas supporting the species including the Lakeside Archipelago (Lakeside, CA), 24,000-acre air station at Miramar (San Diego, CA), portions of Marine Corps Base Camp Pendleton (Oceanside, CA), and the 8,800-acre Seal Beach Naval Weapons Station Detachment Fallbrook (Fallbrook, CA).

- ARROYO TOAD (FE, CSSC)

1992 to Present - Conducted intensive research on the activity cycle and habitat use of the Arroyo Toad throughout its range and especially in San Diego County, California. Major contributions to the knowledge of this species' natural history and ecology include the first documentation of non-aquatic thermoregulation in adults of a nocturnal member of the family Bufonidae; documentation of rain-induced year-round activity periods; the relationship between soil composition, soil moisture content, and Arroyo Toad upland habitat use leading to the development of upland (non-breeding) survey methods; and an approved relocation protocol for U.S. Fish and Wildlife Service. Peer review of arroyo toad survey protocols and critical habitat designations for U. S. Fish & wildlife Service.

- SOUTHWESTERN WILLOW FLYCATCHER (FE, CE)

1993 to present - Principal Investigator and study design for the longest continuous ecological study of the southwestern willow flycatcher in the United States. Studies include monitoring the largest and most stable population of southwestern willow flycatchers in the state of California. The focus of Haas' work is the documentation of the flycatcher's population trends; breeding biology and ecology; and effects of activities occurring within and along the river bottom and closely associated uplands of the upper San Luis Rey River, San Diego County, CA. The study site is home each summer to a population of between 42 and to 51 pairs of this endangered flycatcher. Major contributions to the species survivorship include the development of a safe method of color marking to facilitate long-term study of the species, which led to the discovery of the significant differences between males and females of the species not only with respect to behaviors but also to habitat use and partitioning with significant implications to habitat restoration and recovery guidelines. Contributor and reviewer for the initial U. S. Fish & Wildlife Service-approved willow flycatcher survey protocol.

RELEVANT PUBLICATIONS and REPORTS

Campbell, K. F., R. A. Erickson, W. E. Haas, and M. A. Patten. 1998. California Gnatcatcher use of habitats other than coastal sage scrub: Conservation and management implications. *W. Birds* 29:421-433.

Haas, W. E. and K. Fischer. 1999. An improved method of preparing small color bands. *N. Am. Bird Bander*. 24:42-43.

Haas, W. and K. Campbell. 2003. Report of Coastal California Gnatcatcher Juvenile Dispersal across Interstate-8 at the MSCP Southern Lakeside Archipelago Lands San Diego County, California. Varanus Biological Services/Campbell BioConsulting Report prepared for: County of San Diego Department of Parks and Recreation. June.

Haas, W, and L. Hargrove. 2003. A solution to leg band injuries in willow flycatchers. *Studies in Avian Biology*, Cooper Ornithol. Soc., Lawrence, KS.

- Haas, W. E. 2004. Long-eared Owl (*Asio otus*), in San Diego County bird atlas (P. Unitt, ed.), pp. 291–293. Proc. San Diego Soc. Nat. Hist. 39.
- Haas, W. E. 2004. Black-throated Geay Warbler (*Dendroica nigrescens*), in San Diego County bird atlas (P. Unitt, ed.), pp. 291–293. Proc. San Diego Soc. Nat. Hist. 39.
- Haas, W. E. 2004. Cassin's Vireo (*Vireo cassinii*), in San Diego County bird atlas (P. Unitt, ed.), pp. 291–293. Proc. San Diego Soc. Nat. Hist. 39.
- Haas, W. E. 2004. Spotted Owl (*Strix occidentalis*), in San Diego County bird atlas (P. Unitt, ed.), pp. 291–293. Proc. San Diego Soc. Nat. Hist. 39.
- Haas, W. 2006. Results of Riparian Bird Breeding Census and habitat modeling in the Indian Canyons of the Aqua Caliente Indian Reservation, Palm Springs, Riverside County, California. 33pp
- Haas, W. and I. Quon. 2008. Importance of second nests following a catastrophic weather event: Evidence of colonial behavior in Southwestern Willow Flycatcher (*Empidonax traillii extimus*). W. Birds.
- Haas, W. E. 2010. Baseline bird surveys of the Property, Ocotillo Wells, California. Report prepared for California Department of Parks and Recreation Ocotillo Wells SVRA under agreement C0754015. 28pp.
- Haas, W. E. 2010. Distribution of the California gnatcatcher (*Polioptila californica*) on Marine Corps Air Station Miramar; Results of 2009 surveys. Report prepared under contract M67865-08-T-0068. 25p + fig.
- Haas, W. E. and M. G. McCain. 2010. 2010 report: Results of arroyo toad and coast range newt surveys in the San Diego River watershed; Helix Water District amphibian study. Report prepared under contract to Helix Water District, La Mesa, California. 21p+figures & tables.
- Haas, W. E. 2012. Long-term ecosystem monitoring of the vertebrate fauna at Marine Corps Air Station Miramar, San Diego, California: small mammal component, 2009. Report prepared under contract. M67865-08-T-0051. 12pp+figs.
- Haas, W. E. 2012. Long-term ecosystem monitoring of the vertebrate fauna at Marine Corps Air Station Miramar, San Diego, California: bird survey component, 2009. Report prepared under contract. M67865-08-T-0051. 23pp+figs & app.
- Haas, W. E. 2012. Long-term ecosystem monitoring of the vertebrate fauna at Marine Corps Air Station Miramar, San Diego, California: Reptile & Amphibian Component, 2009. Report prepared under contract. M67865-08-T-0051. 17pp+appendices
- Haas, W. E. 2012. Long-term Ecosystem Monitoring of Fauna Marine Corps Air Station, San Diego, California; Results of 2008 Spotlight Surveys. Solicitation No. M67865-08-T-0051. 12pp+app.
- Haas, W. E. 2012. 2011 report: Results of arroyo toad and coast range newt surveys in the San Diego River watershed; Helix Water District amphibian study. Report prepared under contract to Helix Water District, La Mesa, California. 23pp + figures & tables.

Haas, W. *In press* (2013). Activity cycle of the arroyo toad (*Anaxyrus californicus*) in San Diego County. *Herpetologica*.

Haas, W. *In Press* (2013). Thermoregulation in adult female arroyo toads. *Herpetologica*.

Haas, W. *In Press* (2013). Ecology of the Willow Flycatchers along the upper San Luis Rey River. *W. Birds*.

Haas, W., T. Lee, and K. Klutz. *In prep*. Effects of fire-related sedimentation on arroyo toad recruitment.

Zych, A. C. and W. E. Haas. 2006. Results of preliminary surveys for the arroyo toad and Coast Range newt in the San Diego River Watershed, Helix Water District water release regime study. Report prepared under contract to Helix Water District, La Mesa, California. 38pp.+ii

Exhibit 313

DECLARATION OF WILLIAM E. HAAS

I, **William E. Haas** declare as follows:

1. I am presently a consultant to the California Energy Commission, Siting, Transmission, and Environmental Protection Division as a Wildlife Biologist/Ornithologist.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I helped prepare the staff testimony on **Appendix BIO1 – Biological Resources Risk Assessment of Avian Exposure to Concentrated Solar Radiation** for the **Hidden Hills Solar Electric Generating System [HHSEGS] (11-AFC-2)** project based on my independent analysis of the Application for Certification and any supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.
5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 02/25/2013 Signed: William E. Haas

At: Paso Robles, California

Exhibit 314

CAROLYN CHAINEY-DAVIS

Botanist, Environmental Planner, Waters & Wetland Delineations, Vegetation Mapping

PROFESSIONAL EXPERIENCE

Ms. Davis has more than 23 years experience conducting biological inventories and impact assessments, and preparing mitigation, monitoring, and habitat management plans with an emphasis since 1997 on energy and transmission projects. Recently, she served as the lead botanist in the preparation of staff assessments, mitigation and monitoring plans for seven solar thermal projects in the Mojave and Sonoran Desert regions recently licensed by the California Energy Commission. In this capacity she worked closely with Bureau of Land Management, California Department of Fish and Game, U.S. Fish and Wildlife Service, and a wide variety of experts from various agencies and academia to build consensus and peer review analyses and mitigation plans for issues relating to: special-status plants, waters of the state and waters of the U.S., groundwater-dependent ecosystems, noxious weeds, revegetation of disturbed lands, and riparian systems. She has also led GIS-based and regional scale assessments of cumulative effects for both wildlife and botanical resources. She has prepared over 300 CEQA and NEPA impact assessments.

She has worked with a wide variety of other federal and state agencies, including BOR, USFS, USACE, USGS and CDFG, and a wide variety of water, power, and transmission providers, including PG&E, SCE, and LADWP. She led the botanical and riparian studies for numerous FERC relicensing projects, prepared draft and final reports, and detailed mitigation and long-term monitoring plans. Ms. Chainey-Davis has mapped over 10,000,000 acres of vegetation across California.

Ms. Davis is currently on the Technical Advisory Committee for a review of state waters delineation practices in the California Desert region for CDFG. She is past President of the California Native Plant Society, Nevada and Placer County Chapter and co-author of a recently published field guide to the flora of Nevada and Placer Counties, published by the California Native Plant Society. Ms. Davis completed her wetland training at Portland State University and is certified for conducting wetland delineations based on the U.S. Army Corps of Engineers Wetland Delineation Manual. She was the senior botanist for Garcia and Associates (GANDA) for seven years, and as an independent she has worked with leading botanists, vegetation and wetland ecologists, including Dr. Robert Holland. Ms. Davis' continuing education includes several annual intensive botanical taxonomy workshops through the U.C. Berkeley Jepson Herbarium.

California Energy Commission Power Plant Siting Work: Ms. Chainey-Davis served as lead botanist for six power plant siting projects, including five complex and controversial solar thermal power projects requiring analysis and permitting on a fast-track schedule. She organized a regional-scale GIS-based cumulative impact assessment for two additional siting projects. As the primary author of the cumulative effects and botanical resource subsections of the staff assessments including state waters and groundwater-dependent ecosystems, Ms. Chainey-Davis represented the Energy Commission in regularly conducted issue resolution workshops and interagency conference calls, provided testimony at the Energy Commission's Evidentiary Hearings, and coordinated extensively with Energy Commission siting and legal staff, as well as state and federal agencies. All siting projects were conducted as a contractor to Aspen Environmental Group, and include the following:

- **Hidden Hills Solar Electric Generating System** – A proposed 5 square mile concentrating solar power project in southeastern Inyo County (2012-2013).
- **Palen Solar Power Project** – A 500 MW, 3000-acre solar parabolic trough power plant east of Desert Center, eastern Riverside County (2009–2011).
- **Blythe Solar Power Project** – A 1000 MW, 7000-acre solar parabolic trough power plant near Blythe in eastern Riverside County (2009–2010).
- **Genesis Solar Power Project** – A 250 MW, 2000-acre solar parabolic trough power plant east of Desert Center, eastern Riverside County (2009–2010).
- **Beacon Solar Energy Project** – A 250 MW, 2000-acre solar parabolic trough power plant north of California City, eastern Kern County (2008–2010).
- **Ivanpah Solar Electric Generating System** – A 370 MW, 3,600-acre concentrating solar power project in eastern San Bernardino County (2008–2011).
- **Calico Solar Project** – A 663 MW Sterling Engine solar power plant in San Bernardino County (2008-2010) (cumulative effects analysis only)
- **Ridgecrest Solar Power Project** – A 250 MW solar parabolic trough power plant in eastern Kern County (2009-2010) (cumulative effects analysis only)

PREVIOUS PROJECT EXPERIENCE

A sampling Ms. Chainey-Davis' experience, with an emphasis on energy projects, botanical resource studies, and waters delineations:

- **Mokelumne River Hydroelectric Project Relicensing Studies (PG&E).** Worked with statistician to prepare riparian resources sampling design, data analysis and presentation, and to create a Microsoft Access database for long-term data collection, and prepared manual for field data collection. Led field efforts to collect data, and prepared draft and final reports. PG&E was awarded Environmental Leadership Award for success working with stakeholders to reach an agreement for operating and maintaining the Project, and recognized by the National Hydropower Association for outstanding environmental stewardship of the Mokelumne River in 2003, 2004.
- **Lower Owens River Monitoring Program (Ecosystem Sciences).** Co-authored long-term monitoring program for collecting and analyzing data on riparian habitat and key wildlife habitat characteristics on 62 miles of the lower Owens River for the Lower Owens River Project (LORP) restoration. Directed and field efforts to collect baseline data at 350 sites. Worked with a statistician in the analysis of the sampling data.
- **Stanislaus River Hydroelectric Project Relicensing Studies (PG&E).** Led field efforts to conduct floristically-based botanical studies for the FERC relicensing of four hydroelectric and transmission line projects located on the Stanislaus River, Stanislaus National Forest. Riparian and watershed vegetation mapping and sampling, special-status plant surveys, noxious weed mapping, and mapping culturally significant Native American botanical resources. Prepared draft and final reports.
- **North Fork Feather River and Poe Hydroelectric Project Relicensing Studies (PG&E).** Led field efforts to conduct floristically-based botanical studies for the FERC relicensing of four hydroelectric and transmission line projects located on the Upper North Fork Feather River and Poe Project (Feather River above Lake Oroville). Riparian and watershed vegetation mapping and sampling, special-status plant surveys, noxious weed mapping, and mapping culturally significant Native American botanical resources. Prepared draft and final reports. Also prepared a long-term habitat management plan for the montane meadows on the north and west side of Lake Almanor.
- **Field Guide to *Epilobium* in the Sierra Nevada, Tahoe National Forest (U.S.D.A. Forest Service, Tahoe and Inyo National Forests -Open-ended Contract).** Conducted surveys for rare *Epilobium* spp. at seven sites in the Inyo and Tahoe National Forests and prepared a field guide to the genus *Epilobium* in the Sierra Nevada, with illustrations and keys to identification.
- **Open ended Contract for Biological Services for Southern California Edison (SCE) Transmission Projects (Garcia and Associates).** Led habitat assessments, mapped vegetation,

and prepared draft reports in support of various SCE construction and relicensing projects in the central and southern Sierras, Sierra east slope and Great Basin region, and the eastern edge of the San Joaquin Valley, including six transmission projects in the southwest region.

- **Open ended Contract for Biological Services for Pacific Gas & Electric Company (PG&E) Transmission Projects (Garcia and Associates).** Led botanical studies (rare plant surveys, vegetation mapping, habitat assessments, etc.) in support of various PG&E transmission projects throughout California.
- **Vermilion Hydroelectric Project: Botanical Surveys (Entrix).** Conducted wildlife special-status plant and noxious weed surveys, rare plant surveys for the Vermilion Project in the high elevations of eastern Fresno County, in the central Sierras. Complete floristic surveys were conducted for sensitive plant species, as well as invasive species.
- **Kern River Gas Transmission Project (Entrix).** Conducted special-status plant surveys across the eastern Mojave segments of the gas pipeline project, into western Nevada.
- **Storrie Fire Salvage Project and other Forest Salvage Project in the USFS Plumas National Forest (USFS Plumas NF).** Lead botanist and author for botanical resources components of the Environmental Assessment for the Storrie Fire Salvage Project and other fire salvage projects in the Plumas National Forest. Also prepared special-status plant and noxious weed management plans for avoiding project effects. Led field efforts to conduct floristically-based special-status plant surveys, vegetation mapping, and noxious weed surveys.
- **Rock Creek/Cresta Hydroelectric Project (CH2M Hill).** Conducted floristically-based special status plant surveys and habitat mapping for PG&E's Rock Creek-Cresta hydroelectric facility project area and 72-mile transmission line in Plumas, Butte, Yuba and Sutter counties. PG&E was awarded the National Hydro Association's "Outstanding Stewards of America's Rivers" Award for outstanding work on the Rock Creek-Cresta and Mokelumne River Projects.
- **Hamilton Branch Hydroelectric Project (PG&E).** Led field efforts to conduct floristically-based special-status plant surveys, vegetation mapping, and noxious weed surveys for the PG&E Hamilton Branch Hydroelectric Project in Lassen County. Conducted surveys on all facilities and access roads associated with the license, including Mountain Meadows Reservoir near Westwood, CA. Project created GIS-based vegetation and noxious weed maps and tabular data. Prepared draft and final reports.
- **AT&T Dunnigan to Manchester Fiber Optic Upgrade (Ecology & Environment).** Led field efforts to conduct floristically-based special-status plant surveys, vegetation mapping, and noxious weed surveys for the AT&T Dunnigan to Manchester Fiber Optic Upgrade, from the Central Valley, across the North Coast Range, to Manchester. In Mendocino County. Lead author for botanical resources report.
- **Over 300 Biological Inventories, Impact Assessments, and Wetland Delineations for Residential and Commercial Developments (Susan Sanders Biological Consulting, Beedy Environmental Consulting, Ecobridges Consulting).** Prepared biological inventories, impact assessments and mitigation plans for hundreds of large and small projects across California since 1996.
- **U.S. Borax Mine Reclamation (Garcia and Associates).** Worked with statistician to prepare an analysis of 15 years of monitoring data for a large-scale mine reclamation (revegetation) project in the western Mojave Desert.
- **Natural Heritage 2020 Nevada County Watershed Assessment (County of Nevada and Sierra Business Council).** Lead botanist for a countywide watershed and ecosystem assessment for 98 sub-watershed basins in the county. Verified accuracy of more than 40 countywide GIS data themes, assessed the extent and quality of each of the county's large and small-patch ecosystem types and their suitability or occurrence potential for special-status plants and animals. Mapped, photo-logged,

described and collected GPS coordinates, and prepared draft report for sections on habitats, special-status plants, and noxious weeds.

- **Dog Ranch-Salmon Creek Conservation Project (Robert Holland).** Conducted endangered species surveys and documented over 300 occurrences of special status plants (using Trimble data dictionary and population sampling protocol) for a proposed conservation easement/land swap on a 400+ acre ranch in Humboldt County on the Samoa Peninsula.
- **Delineation of Episodic Streams in Drylands (California Department of Fish and Game).** Conducted nearly 100 plot-based assessments of vegetation characteristics of alluvial fan stream networks in the California desert region. Utilized paired plots to compare vegetation along washes and in adjacent uplands. Helped develop and beta-tested a draft field data sheet of fluvial geomorphic indicators.
- **Parks Reserve Forces Training Area (Booz-Allen).** Conducted wetland delineation of vernal pools and other seasonal wetlands at the Parks Reserve Forces Training Area in Dublin, CA.
- **Various CalTrans Natural Environment Study (NES) (PAR Environmental Consulting and Beedy Environmental Consulting).** Conducted routine wetland delineations, biological inventory and impact assessment, and mitigation plans in support of various CalTrans NES.
- **Travis Air Force Base Vernal Pool Study and Wetland Delineation (CH2M Hill).** Conducted floristically-based special status plant surveys, wetland delineation and habitat-ranking of natural and artificially-created pools at Travis Air Force Base in Fairfield.
- **Beale Air Force Base Best Slough Vernal Pool Study and Wetland Delineation (CH2M Hill).** Conducted floristically-based special status plant surveys, and wetland delineation of vernal pools and other seasonal wetlands at the Best Slough Super Fund site at Beale Air Force Base in Yuba County.
- **Owens Lake Dust Control Project Wetland Delineation and Rare Plant Surveys (CH2M Hill).** Conducted two years of floristically-based special status plant surveys and wetland delineations for the Los Angeles Department of Water and Power Owens Lake Dust Control mitigation project.

Exhibit 315

DECLARATION OF CAROLYN CHAINEY-DAVIS

I, **Carolyn Chainey-Davis** declare as follows:

1. I am presently a consultant to the California Energy Commission, Siting, Transmission and Environmental Protection Division as a Biological Resource Specialist (Associate Level II).
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I helped prepare the staff testimony on **Biological Resources** for the **Hidden Hills Solar Electric Generating System [HHSEGS] (11-AFC-2)** project based on my independent analysis of the Application for Certification and any supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.
5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: February 25, 2013 Signed: Signed Original on File

At: Nevada, California

Exhibit 316

Risk Science Associates

37 Mt. Whitney Dr., Suite A, San Rafael, Ca. 94903
415-479-7560 fax 415-479-7563
e-mail agreenberg@risksci.com

Name & Title: **Alvin J. Greenberg, Ph.D., QEP**
 Principal Toxicologist

Dr. Greenberg has had over two decades of complete technical and administrative responsibility as a team leader in the preparation of human and ecological risk assessments, air quality assessments, hazardous materials handling and risk management/prevention, infrastructure vulnerability assessments, occupational safety and health, hazardous waste site characterization, interaction with regulatory agencies in obtaining permits, and conducting lead surveys and studies. He has particular expertise in the assessment of dioxins, lead, diesel exhaust, petroleum hydrocarbons, mercury, the intrusion of subsurface contaminants into indoor air, and the preparation and review of public health/public safety sections of EIRs/EISs. Dr. Greenberg's expertise in risk assessment has led to his appointment as a member of several state and federal advisory committees, including the California EPA Advisory Committee on Stochastic Risk Assessment Methods, the US EPA Workgroup on Cumulative Risk Assessment, the Cal/EPA Peer Review Committee of the Health Risks of Using Ethanol in Reformulated Gasoline, the California Air Resources Board Advisory Committee on Diesel Emissions, the Cal/EPA Department of Toxic Substances Control Program Review Committee, and the DTSC Integrated Site Mitigation Committee. Dr. Greenberg is the former Chair of the Bay Area Air Quality Management District Hearing Board, a former member of the State of California Occupational Health and Safety Standards Board (appointed by the Governor), and former Assistant Deputy Chief for Health, California OSHA. And, since the events of 9/11, Dr. Greenberg has been the lead person for developing vulnerability assessments, power plant security programs, and conducting safety and security audits of power plants for the California Energy Commission and has assisted the CEC in the assessment of safety and security issues for proposed LNG terminals. In addition to providing security expertise to the State of California, Dr. Greenberg was the Team Leader and main consultant to the State of Hawaii on the updating of their Energy Emergency Preparedness Plan.

Years Experience: 32

Education:

B.S. 1969 Chemistry, University of Illinois Urbana

Ph.D. 1976 Pharmaceutical/Medicinal Chemistry, University of California,
San Francisco

Postdoctoral Fellowship 1976-1979 Pharmacology/Toxicology, University of
California, San Francisco

Postgraduate Training 1980 Inhalation Toxicology, Lovelace Inhalation
Toxicology Research Institute, Albuquerque, NM

Professional Registrations:

Board Certified as a Qualified Environmental Professional (QEP)
California Registered Environmental Assessor - I (REA) (program discontinued in 2012)
Fellow of the American Institute of Chemists (FAIC)

Professional Affiliations:

Society for Risk Analysis
American Chemical Society
National Fire Protection Association

Technical Boards and Committee Memberships - Present:

Squaw Valley Technical Review Committee
(appointed 1986)

Technical Boards and Committee Memberships - Past:

July 1996 – March 2002

Member, Bay Area Air Quality Management District Hearing Board
(Chairman 1999-2002)

September 2000 – February 2001

Member, State Water Resources Control Board Noncompliant Underground
Tanks Advisory Group

January 1999 – June 2001

Member, California Air Resources Board Advisory Committee on Diesel
Emissions

January 1994 - September 1999

Vice-Chairman, State Water Resources Control Board Bay Protection and Toxic
Cleanup Program Advisory Committee

September 1998

Member, US EPA Workgroup on Cumulative Risk Assessment

April 1997 - September 1997

Member, Cal/EPA Private Site Manager Advisory Committee

January 1986 - July 1996

Member, Bay Area Air Quality Management District Advisory Council
(Chairman 1995-96)

January 1988 - June 1995

Member: California Department of Toxic Substance Control Site Mitigation
Program Advisory Group

January 1989 - February 1995

Member: Department of Toxics Substances Control Review Committee, Cal-EPA

October 1991 - February 1992

Chair: Pollution Prevention and Waste Management Planning Task Force of the
Department of Toxics Substances Control Review Committee, Cal-EPA

September 1990 - February 1991

Member: California Integrated Waste Management Board Sludge Advisory Committee

September 1987 - September 1988

ABAG Advisory Committee on Regional Hazardous Waste Management Plan

March 1987 - September 1987

California Department of Health Services Advisory Committee on County and Regional Hazardous Waste Management Plans

January 1984 - October 1987

Member, San Francisco Hazardous Materials Advisory Committee

March 1984 - March 1987

Member, Lawrence Hall of Science Toxic Substances and Hazardous Materials Education Project Advisory Board

Jan. 1, 1986 - June 1, 1986

Member, Solid Waste Advisory Committee, Governor's Task Force on Hazardous Waste

Jan. 1, 1983 - June 30, 1985

Member, Contra Costa County Hazardous Waste Task Force

Sept. 1, 1982 - Feb. 1, 1983

Member, Scientific Panel to Address Public Health Concerns of Delta Water Supplies, California Department of Water Resources

Present Position

January 1983- present

Owner and principal with Risk Sciences Associates, a Marin County, California, environmental consulting company specializing in multi-media human health and ecological risk assessment, air pathway analyses, hazardous materials management-infrastructure security, environmental site assessments, review and evaluation of EIRs/EISs, preparation of public health and safety sections of EIRs/EISs, and litigation support for toxic substance exposure cases.

Previous Positions

Jan. 2, 1983 - June 12, 1984

Member, State of California Occupational Safety and Health Standards Board (Cal/OSHA), appointed by the Governor

Aug. 1, 1979 - Jan. 2, 1983

Assistant Deputy Chief for Health, California Occupational Safety and Health Administration

Feb. 1, 1979 - Aug. 1, 1979

Administrative Assistant to Chairperson of Finance Committee, Board of Supervisors, San Francisco

Jan. 1, 1976 - Feb. 1, 1979

Research Pharmacologist and Postdoctoral Fellow, Department of Pharmacology and Toxicology, School of Medicine, University of California, San Francisco

Jan. 1, 1975 - Dec. 31, 1975

Acting Assistant Professor, Department of Pharmaceutical Chemistry, University of California, San Francisco

Experience

General

Dr. Greenberg has been a consultant in Hazardous Materials Management and Security, Human and Ecological Risk Assessment, Occupational Health, Toxicology, Hazardous Waste Site Characterization, and Toxic Substances Control Policy for over 32 years. He has broad experience in the identification, evaluation and control of health and environmental hazards due to exposure to toxic substances. His experience includes Community Relations Support and Risk Communication through experience at high-profile sites and presentations at professional society meetings.

He has considerable experience in the review and evaluation of exposure via the air pathway - particularly to emissions from power plants, refineries, and diesel exhaust - and a thorough knowledge of the regulatory requirements through his experience at Cal/OSHA, the BAAQMD Hearing Board, as a consultant to the California Energy Commission, and in preparing such assessments for local government and industry. He has assessed exposures to diesel exhaust during construction and operations of stationary and mobile sources and has testified at evidentiary hearings numerous times on this subject.

He is presently assisting the California Energy Commission in assessing the risks to workers and the public of proposed power plants and hazardous wastes on those sites. His experience in hazard identification, exposure assessment, risk assessment, occupational safety and health, emergency response, and Critical Infrastructure Protection has made him a valuable part of the CEC team addressing this issue. He has conducted numerous evaluations of the safety and hazards of natural gas pipelines for the CEC and has presented his findings and recommendations at public meetings and evidentiary hearings.

He served for over five years as the Vice-chair of the California State Water Resources Control Board Advisory Committee convened to address toxic substances in sediments in bays, rivers, and estuaries. He has been a member of the Squaw Valley Technical Review Committee since 1986 establishing chemical application management plans at golf courses to protect surface and

groundwater quality. He has also conducted numerous ecological risk assessments and characterizations, including those for marine and terrestrial habitats.

Dr. Greenberg has extensive experience in data collection and preparation of human and ecological risk assessments on numerous military bases and industrial sites with Cal/EPA DTSC and RWQCB oversight. He has also been retained to provide technical services to the Cal/EPA Department of Toxic Substances Control (preparation of human health risk assessments) and the Office of Environmental Health Hazard Assessment (review and evaluation of air toxics health risk assessments and preparation of profiles describing the acute and chronic toxicity of toxic air contaminants). He has also conducted several surveys of sites containing significant lead contamination from various sources including lead-based paint, evaluated potential occupational exposure to lead dust and fumes in industrial settings, prepared numerous human health risk assessments of lead exposure, and prepared safety and health plans for remedial investigation of lead contaminated soils. Dr. Greenberg is also a recognized expert on the requirements of California's Proposition 65 and has served as an expert on Prop. 65 litigation.

Sites with EPA, RWQCB and/or DTSC Oversight

Dr. Greenberg has specific experience in assessing human health and ecological risks at contaminated sites at the land/water interface, including petroleum contaminants, metals, mercury, and VOCs at several locations in California including Oxnard, Richmond, Avila Beach, Mare Island Naval Shipyard, San Diego, Hollister, San Francisco, Hayward, Richmond, the Port of San Francisco, and numerous other locations. He has used Cal/EPA methods, US EPA methods, and ASTM Risk Based Corrective Action (RBCA) and Cal/Tox methodologies. He is extremely knowledgeable about SWRCB and SF Bay RWQCB regulations on underground storage tank sites and with ecological issues presented by contaminated sediments including sediment analysis, toxicity testing, tissue analysis, and sediment quality objectives. Dr. Greenberg served on the State Water Resources Control Board Bay Protection and Toxic Cleanup Program Advisory Committee from 1994 until the end of the program in 1999.

Dr. Greenberg experience on many of these contaminated sites has been as a consultant to local governments, state agencies, and citizen groups. He assisted the City and County of San Francisco in developing local ordinance requiring soil testing (Article 20, Maher ordinance) and hazardous materials use reporting (Article 21, Walker ordinance). He served as the City of San Rafael's consultant to provide independent review and evaluation of the site characterization and remedial action plan prepared for a former coal gasification site. He was a consultant to a citizen group in northern California regarding exposure and risks due to accidental releases from a petroleum refinery and assisted in the assessment of risks due to crude petroleum contamination of a southern California beach. He has prepared a number of risk assessments addressing crude petroleum, diesel and gasoline contamination, including coordinating site investigations, environmental monitoring, and health risk assessment for the County of San Luis Obispo regarding Avila Beach subsurface petroleum contamination. That high-profile project lasted for over one year and Dr. Greenberg managed a team of experts with a budget of \$750,000. Another high-profile project included the preparation of an extensive comprehensive human and ecological risk assessment for the Hawaii Office of Space Industry on rocket launch impacts and transportation/storage of rocket fuels at the southern end of the Big Island of Hawaii. Dr. Greenberg's risk assessments were part of the EIS for the project. Dr. Greenberg also worked on another high-profile project conducting Air Pathway Analysis of off-site and on-site impacts

from landfill gas constituents, including indoor and outdoor air measurements, air dispersion modeling, flux chamber investigations, and health risk assessment for the County of Santa Barbara. Dr. Greenberg has conducted RI/FS work, prepared health risk assessments, evaluated hazardous waste sites and hazardous materials use at numerous locations in California, Hawaii, Oregon, Minnesota, Michigan, and New York. He has considerable experience in the development of clean-up standards and the development of quantitative risk assessments for site RI/FS work at CERCLA sites, as well as site closures, involving toxic substances and petroleum hydrocarbon wastes. He is experienced in working with both Region IX EPA and the State of California DTSC in negotiating clean-up standards based on the application of both site-specific and non site-specific health and ecological based clean-up criteria. He has significant experience in the development of site chemicals of concern list, quantitative data quality levels, site remedial design, the site closure process, the design and execution of data quality programs and verification of data quality prior to its use in the decision making process on large NPL sites.

Examples

Human Health Risk Assessments for the Ophir Road, 20th St., Durham, and Norcal Scrap Metal Recycling Sites (September 2010 – present)

Human Health Risk Assessment and Hazardous Material Assessment at the former Nestle Waters of North America, Inc. McCloud Site (August 2012)

Review and Evaluation of the Extent of Contamination and Risk Posed by the former Unocal Tank Farm Area, San Luis Obispo, CA (July 2009 – April 2011)

Review and Evaluation of the former Mill Hazardous Waste Site, North Fork, CA (2009)

The Avila Beach Health Study Phase 1: Reconnaissance Sampling Findings, Conclusions, and Recommendations. (July 1997) Volume 1: Baseline Human Health Risk Assessment. (May 1998)

The Avila Beach Health Study Phase 1, Volume 2: Environmental Monitoring. (May 1998)

Health Risk Assessment and Air Pathway Analysis for the Ballard Canyon Landfill, Santa Barbara County, Ca. (March 1999)

Screening Human Health Risk Assessment, Calculation of Soil Clean-up Levels, and Aquatic Ecological Screening Evaluation, Galilee Harbor, Sausalito, Ca. (May 1998)

Health Risk Assessment Due to Diesel Train Engine Emissions, Oakland, Ca. (June 1999)

Health Risk Assessment for Residual Mercury at the Deer Creek Facility, 3475 Deer Creek Road, Palo Alto, California. (July 1997)

Phase 2 Human Health Risk Assessment, Teledyne Inc., San Diego, Ca. (February 1997)

Human Health Risk Assessment, Teledyne Ryan Aeronautical, McCormick Selph Ordnance. Hollister, California. (December 1996)

Initial Phase Human Health Risk Assessment, Teledyne Inc., San Diego, Ca. (October 1996)

Human Health Risk Assessment, Ecological Screening Evaluation, and Development of Proposed Remediation Goals for the Flair Custom Cleaners Site, Chico, California (January 1996)

Human Health Risk Assessment for the X-3 Extrudate Project at Criterion Catalyst, Pittsburg, Ca. (November 1994)

Screening Health Risk Assessment and Development of Proposed Soil Remediation Levels at Hercules Plant #3, Culver City, Ca. (July 1993)

Ecological Screening Evaluation for the Altamont Landfill, Alameda County, Ca. (June, 1993)

Focused Ecological Risk Characterization, Hawaiian Electric Company, Keahole Generating Station Expansion, Hawaii (June 1993)

Human Health Risk Assessment for the Proposed Palima Point Space Launch Complex, prepared for the Hawaii Office of Space Industry (April 1993)

Ecological Risk Assessment for the Proposed Palima Point Space Launch Complex, prepared for the Hawaii Office of Space Industry (March 1993)

Human Health Risk Assessment for Current and Proposed Expanded Class II and Class III Operations at the Altamont Sanitary Landfill, Alameda County, Ca. (March, 1993)

Screening Health Risk Assessment for the Proposed Expansion of the West Marin Sanitary Landfill, Point Reyes Station, Ca. (March, 1993)

Health Risk Assessment for the Proposed Expansion of the Forward, Inc. Landfill, Stockton, Ca. (September 14, 1992)

Health Risk Assessment for the Rincon Point Park Project, San Francisco, Ca. Prepared for Baseline Environmental Consulting and the San Francisco Redevelopment Agency. (August 10, 1992)

Health Risk Assessment for the South Beach Park Project, San Francisco, Ca. Prepared for Baseline Environmental Consulting and the San Francisco Redevelopment Agency. (August 10, 1992)

Screening Health Risk Assessment and Development of Proposed Soil and Groundwater Remediation Levels, Kaiser Sand and Gravel, Mountain View, Ca. Prepared for Baseline Environmental Consulting (January 30, 1992)

Development of Proposed Soil Remediation Levels for the Marine Corps Air-Ground Combat Center, 29 Palms, California (May 30, 1991)

Preliminary Health Risk Assessment for the City of Pittsburg Redevelopment Agency, Pittsburg, California (May 29, 1991)

Military Bases

Dr. Greenberg has experience in conducting assessments at DOD facilities, including RI/FS work, preparation of health risk assessments, evaluation of hazardous waste sites and hazardous materials use at the following Navy sites in California: San Diego Naval Base; Marine Corps Air-Ground Combat Center, 29 Palms; Mare Island Naval Shipyard, Vallejo; Treasure Island Naval Station, San Francisco, Hunters Point Naval Shipyard, San Francisco, and the Marine Corps Logistics Base, Barstow. He worked with the U.S. Navy and the U.S. EPA in the implementation of Data Quality Objectives (DQO's) at MCLB, Barstow.

Examples

Review and Evaluation of the Remedial Investigation Report and Human Health Risk Assessment for the U. S. Naval Station at Treasure Island, Ca. (June 1999)

Screening Health Risk Assessment for the Proposed San Francisco Police Department's Helicopter Landing Pad at Hunters Point Shipyard, San Francisco, Ca. (September 1997)

Development of Proposed Soil Remediation Levels for the Marine Corps Air-Ground Combat Center, 29 Palms, California (May 30, 1991)

Health Risk Assessment for the Chrome Plating Facility, Mare Island Naval Shipyard, Vallejo, California (October 24, 1988)

Background Levels and Health Risk Assessment of Trace Metals present at the Naval Petroleum Reserve No.1, 27R Waste Disposal Trench Area, Lost Hills, California (August 12, 1988)

RCRA Facility Investigation (RFI) Work Plan of Lead Oxide Contaminated Areas, Mare Island Naval Shipyard, Vallejo, California. Prepared in conjunction with Kaman Sciences Corp. (August 14, 1989)

Hazardous Waste and Solid Waste Audit and Management Plan, Mare Island Naval Shipyard, Vallejo, California. Prepared in conjunction with Kaman Sciences Corp. (July 3, 1989)

Water Quality Solid Waste Assessment Test (SWAT) Proposal RCRA Landfill, Mare Island Naval Shipyard, Vallejo, California. Prepared in conjunction with Kaman Sciences Corp. (October 31, 1988)

Waste Disposal Facilities, Waste Haulers, Waste Recycling Facilities Report, Mare Island Naval Shipyard, Vallejo, California. Prepared in conjunction with Kaman Sciences Corp. (September 22, 1988)

Sampling and Analysis Plan, Health and Safety Plan, Site Characterization of Lead Oxide Contaminated Areas, Mare Island Naval Shipyard, Vallejo, California. Prepared in conjunction with Kaman Sciences Corp. (September 2, 1988)

Air Quality Solid Waste Assessment Test (SWAT) Proposal, Mare Island Naval Shipyard, Vallejo, California. Prepared in conjunction with Kaman Sciences Corp. (August 25, 1988)

Liquefied Natural Gas (LNG)

Dr. Greenberg assisted the CEC in the preparation of the “background” report on the risks and hazards of siting LNG terminals in California (“LNG in California: History, Risks, and Siting” July 2003) and consulted for the City of Vallejo on a proposed LNG terminal and storage facility at the former Mare Island Naval Shipyard. He has also conducted an evaluation and prepared comments on the risks, hazards, and safety analysis of the DEIS/DEIR for the City of Long Beach on a proposed LNG terminal at the Port of Long Beach (POLB) and conducted an analysis on vulnerability and critical infrastructure security for the CEC on this same proposed LNG terminal. He currently advises the CEC on the POLB LNG proposal on risks, hazards, human thresholds of thermal exposure, vulnerability, security, and represented the CEC at a U.S. Coast Guard briefing on the Waterway Suitability Assessment that included the sharing of SSI (Sensitive Security Information). He has presented technical information and analysis to the State of California LNG Interagency Working Group on thermal radiation public exposure criteria and safety/security at an east coast urban LNG terminal. (Both presentations are confidential owing to the nature of the material.) He has conducted numerous evaluations of the safety and hazards of natural gas pipelines for the CEC and has presented his findings and recommendations at public meetings and evidentiary hearings.

Infrastructure Security

Since 2002, Dr. Greenberg has been trained by and is working with the Israeli company SB Security, LTD, the most experienced and tested security planning and service company in the world. Since the events of 9/11, Dr. Greenberg has been the lead person for developing vulnerability assessments and power plant security programs for the California Energy Commission (CEC). In taking the lead for this state agency, Dr. Greenberg has interfaced with the California Terrorism Information Center (CATIC) and provided analysis, recommendations, and testimony at CEC evidentiary hearings regarding the security of power plants within the state. These analyses include the assessment of Critical Infrastructure Protection, threat assessments, criticality assessments, and the preparation of vulnerability assessments and off-site consequence analyses addressing the use, storage, and transportation of hazardous materials, recommendations for security to reduce the threat from foreign and domestic terrorist activities, perimeter security, site access by personnel and vendors, personnel background checks, management responsibilities for facility security, and employee training in security methods. Dr. Greenberg is the lead person in developing a model power plant security plan, vulnerability assessment matrix, and a security training manual for the CEC. The model security plan is used by power plants in California as guidance in developing and implementing security measures to reduce the vulnerability of California’s energy infrastructure to terrorist attack. He has testified at several evidentiary hearings for the CEC on power plant security issues. He also leads an audit team conducting safety and security audits at power plants throughout California that are under the jurisdiction of the CEC. In addition to providing security expertise to the State of California, in August 2004, a team of experts led by Dr. Greenberg was awarded an 18-month contract by the State of Hawaii to update and improve the state’s Energy Emergency Preparedness Plan and

make recommendations for increased security of critical energy infrastructure on this isolated group of islands.

Air Pathway Analysis

Dr. Greenberg has prepared numerous Air Pathway Analyses and human health risk assessments, evaluating exposure at numerous locations in California, Hawai'i, Oregon, Minnesota, Michigan, and New York. He is experienced in working with Region IX EPA, the State of California DTSC, and the Hawai'i Department of Health Clean Air Branch in the application of both site-specific and non site-specific health risk assessment criteria.

Examples

Human Health Risk Assessment of Children's Exposure via the Air Pathway to Diesel Exhaust from School Buses (2007-2008)

Human Health Risk Assessment for the Open Burn/Open Detonation Operation at McCormick Selph, Inc., Hollister, Ca. (June 2003)

Air Quality and Human Health Risk Assessment for the Royal Oaks Industrial Complex, Monrovia, Ca. (January 2003)

Human Health Risk Assessment and Indoor Vapor Intrusion Assessment for the former Pt. St. George Fisheries Site, Santa Rosa, Ca. (October 2002)

Human Health Risk Assessment for the former Sargent Industries Site, Huntington Park, Ca. (July 2001)

Health Risk Assessment Due to Diesel Train Engine Emissions, Oakland, Ca. (June 1999)

The Avila Beach Health Study Phase 1: Reconnaissance Sampling Findings, Conclusions, and Recommendations. (July 1997) Volume 1: Baseline Human Health Risk Assessment. (May 1998)

The Avila Beach Health Study Phase 1, Volume 2: Environmental Monitoring. (May 1998)

Health Risk Assessment and Air Pathway Analysis for the Ballard Canyon Landfill, Santa Barbara County, Ca. (March 1999)

Human Health Risk Assessment, Teledyne Ryan Aeronautical, McCormick Selph Ordnance. Hollister, California. (December 1996)

Initial Phase Human Health Risk Assessment, Teledyne Inc., San Diego, Ca. (October 1996)

Human Health Risk Assessment for Current and Proposed Expanded Class II and Class III Operations at the Altamont Sanitary Landfill, Alameda County, Ca. (March, 1993)

Focused Ecological Risk Characterization, Hawaiian Electric Company, Keahole Generating Station Expansion, Hawai'i (June 1993)

Human Health Risk Assessment for the Proposed Palima Point Space Launch Complex, prepared for the Hawai'i Office of Space Industry (April 1993)

Ecological Risk Assessment for the Proposed Palima Point Space Launch Complex, prepared for the Hawai'i Office of Space Industry (March 1993)

Human Health Risk Assessment Due to Emissions from a Medical Waste Incinerator, prepared for Kauai Veterans Memorial Hospital, Kauai, Hawai'i (1994)

Cancer Risk Assessment for the H-Power Generating Station, Campbell Industrial Park, Oahu, Hawai'i (1988)

Hazardous Materials Assessments, Waste Management Assessments, Worker Safety and Fire Protection Assessments, and Public Health Impacts Assessments

Dr. Greenberg also has significant experience as a consultant and expert witness for the California Energy Commission providing analysis, recommendations, and testimony in the areas of hazardous materials management, process safety management, waste management, worker safety and fire protection, and public health impacts for proposed power plant/cogeneration facilities. These analyses include the evaluation and/or preparation of the following:

- Off-site consequence analyses of the handling, use, storage, and transportation of hazardous materials,
- Risk Management Plans (required by the Cal-ARP) and Business Plans (required by H&S Code section 25503.5),
- Safety Management Plans (required by 8 CCR section 5189),
- Natural gas pipeline safety,
- Solid and hazardous waste management plans,
- Phase I and II Environmental Site Assessments,
- Construction and Operations Worker Safety and Health Programs,
- Fire Prevention Programs,
- Human health risk assessment from stack emissions and from diesel engines, and
- Mitigation measures to address PM exposure, including diesel particulates

Examples

- Almond 2 Power Plant Project, City of Ceres, Ca. 2009 – present. Public health.
- Watson Cogeneration Steam and Electric Reliability Project, Carson, Ca. 2009 – present. Public health.
- Hanford Combined-Cycle Power Plant (amendment), Kings County, Ca. 2008 – present. Public health.
- Henrietta Combined-Cycle Power Plant (amendment), Kings County, Ca. 2008 – present. Public health.
- Lodi Energy Center, Lodi, Cal. 2008 – present. Hazardous materials management, worker safety/fire protection.

- Marsh Landing Generating Station, City of Antioch, Ca. 2008 – present. Hazardous materials management, worker safety/fire protection.
- Palmdale Hybrid Power Plant, Palmdale, Ca. 2008 – present. Hazardous materials management, worker safety/fire protection, public health.
- Stirling Energy Systems Solar 1 Project, San Bernardino County, Ca. 2008 – present. Public health.
- Stirling Energy Systems Solar 2 Project, Imperial County, Ca. 2008 – present. Public health.
- San Joaquin Solar 1&2, Fresno County, Ca. 2008 – present. Hazardous materials management, worker safety/fire protection, public health.
- GWF Tracy Combined Cycle Power Plant, Tracy, Ca. 2008 – present. Hazardous materials management, worker safety/fire protection, public health.
- CPV Vaca Station Power Plant, Vacaville, Ca. 2008 – present. Hazardous materials management, worker safety/fire protection.
- Willow Pass Generating Station, Pittsburg, Ca. 2008 – present. Hazardous materials management, worker safety/fire protection, waste management.
- Avenal Energy Power Plant, Avenal, Ca. 2008 – 2009. Worker safety/fire protection, public health.
- Orange Grove Energy, San Diego County, Ca. 2008-2009. Public health.
- Riverside Energy Resource Center Units 3&4, Riverside, Ca. 2008 – 2009. Hazardous materials management.
- Canyon Power Plant, Anaheim, Ca. 2007 – present. Hazardous materials management, worker safety/fire protection, public health.
- Carlsbad Energy Center, Carlsbad, Ca. 2007 – present. Hazardous materials management, worker safety/fire protection, public health.
- Ivanpah Solar Electric Generating System, San Bernardino County, Ca. 2007 – present. Public health.
- Kings River Conservation District Community Power Project, City of Parlier, Ca. 2007 – 2009. Hazardous materials management, worker safety/fire protection.
- Chula Vista Energy Upgrade Project, Chula Vista, Ca. 2007 – 2009. Hazardous materials management, worker safety/fire protection.
- Chevron Richmond Power Plant Replacement Project, Richmond, Ca. 2007 – 2008. Hazardous materials management, public health.
- Humboldt Bay Generating Station, Eureka, Ca. 2006 – 2008. Hazardous materials management, worker safety/fire protection, waste management.
- El Centro Power Plant – Unit 3 Repower Project, El Centro, Ca. 2006 – 2007. Public health.
- San Francisco Energy Reliability Project, San Francisco, Ca. 2004 – 2006. Hazardous materials management, worker safety/fire protection, waste management, public health
- Inland Empire Energy Center, Romoland, Ca. 2002-3. hazardous materials, worker safety/fire protection, waste management, public health
- Malburg Generating Station Project, City of Vernon, Ca. 2002-3. hazardous materials, worker safety/fire protection, waste management, public health
- Blythe II, Blythe, Ca. 2002-3. hazardous materials, worker safety/fire protection,
- Palomar Energy Center, Escondido, Ca. 2002-3. hazardous materials, worker safety/fire protection, waste management, public health

- Cosumnes Power Project, Rancho Seco, Ca. 2002-3. hazardous materials, worker safety/fire protection, waste management, public health
- Tesla Power Project, Tesla, Ca. 2002-3. hazardous materials, worker safety/fire protection, waste management, public health
- San Joaquin Valley Energy Center, San Joaquin, Ca. 2002-3. hazardous materials, worker safety/fire protection, waste management
- Morro Bay Power Plant, Morro Bay, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management
- Potrero Power Plant Unit 7, San Francisco, Ca., 2001-2: hazardous materials, worker safety/fire protection
- El Segundo Power Redevelopment Project, El Segundo, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management
- Rio Linda Power Project, Rio Linda, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Pastoria II Energy Facility Expansion, Grapevine, Ca., 2001: hazardous materials, worker safety/fire protection
- East Altamont Energy Center, Byron, Ca., 2001-2: hazardous materials, worker safety/fire protection
- Magnolia Power Project, Burbank, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Russell City Energy Center, Hayward, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management
- Woodbridge Power Plant, Modesto, Ca., 2001: hazardous materials, worker safety/fire protection, waste management
- Colusa Power Plant Project, Colusa County, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Valero Refinery Cogeneration Project, Benicia, Ca., 2001: hazardous materials, worker safety/fire protection
- Ocotillo Energy Project, Palm Springs, Ca., 2001: hazardous materials, worker safety/fire protection
- Gilroy Energy Center Phase II Project, Gilroy, Ca., 2001-2: hazardous materials, worker safety/fire protection
- Los Esteros Critical Energy Facility, San Jose, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Roseville Energy Facility, Roseville, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Spartan Power, San Jose, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Inland Empire Energy Center, Romoland, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- South Star Cogeneration Project, Taft, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Tesla Power Plant, Eastern Alameda County, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Tracy Peaker Project, Tracy, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health

- Henrietta Peaker Project, Kings County, Ca., 2001: hazardous materials, worker safety/fire protection, waste management, public health
- Central Valley Energy Center, San Joaquin, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Cosumnes Power Plant, Rancho Seco, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Los Banos Voltage Support Facility, Western Merced County, Ca., 2001-2: waste management, public health
- Palomar Energy Project, Escondido, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Metcalf Energy Center, San Jose, Ca., 2000-1: hazardous materials
- Blythe Power Plant, Blythe, Ca., 2000-1: hazardous materials
- San Francisco Energy Co. Cogeneration Project, San Francisco, Ca., 1994-5: hazardous materials
- Campbell Soup Cogeneration Project, Sacramento, Ca., 1994: hazardous materials
- Proctor and Gamble Cogeneration Project, Sacramento, Ca., 1993-4: hazardous materials
- San Diego Gas and Electric South Bay Project, Chula Vista, Ca., 1993: hazardous materials
- SEPCO Project, Rio Linda, Ca., 1993: hazardous materials
- Shell Martinez Manufacturing Complex Cogeneration Project, Martinez, Ca., 1993: hazardous materials and review and evaluation of EIR

Occupational Safety and Health/Health and Safety Plans/Indoor Air Quality

Dr. Greenberg has significant experience in occupational safety and health, having directed the development, adoption, and implementation of over 50 different Cal/OSHA regulations, including airborne contaminants (>450 substances), lead, asbestos, confined spaces, and worker-right-to-know (MSDSs). He has conducted numerous occupational health surveys and has extensive experience in the sampling and analysis of indoor air quality at residences, workplaces, and school classrooms. He is currently the team leader conducting safety and security audits at power plants throughout California for the California Energy Commission. Safety issues audited include compliance with regulations addressing several safety matters, including but not limited to, confined spaces, lockout/tagout, hazardous materials, and fire prevention/suppression equipment.

Examples

Occupational Safety and Health Audit and Air Pathway Assessment for a Composting System at the Cold Canyon Landfill, San Luis Obispo County (2010)

Review and Evaluation of Public and Worker Safety Issues at the proposed SES LNG Facility, Port of Long Beach. prepared for the City of Long Beach. (November 2005)

Confidential safety and security audit reports for 18 power plants in California. prepared for the California Energy Commission. (January 2005 through March 2006)

Report on the Accidental release and Worker Exposure to Anhydrous Ammonia at the BEP I Power Plant, Blythe, Ca. prepared for the California Energy Commission. (October 2004)

Investigation of a Worker Death in a Confined Space, La Paloma Power plant. prepared for the California Energy Commission. (July 2004)

Preliminary Report on Indoor Air Quality in Elementary School Portable Classrooms, Marin County, Ca. (December 1999)

Health Risk Assessment Due to Diesel Train Engine Emissions, Oakland, Ca. (June 1999)

Air Pathway Analysis for the Ballard Canyon Landfill. Submitted to the County of Santa Barbara, (March 1999)

Review and Evaluation of the Health Risk Assessment for Outdoor and Indoor Exposures at the Former Golden Eagle Refinery Site, Carson, Ca. (May 1998)

The Avila Beach Health Study Phase 1: Reconnaissance Sampling Findings, Conclusions, and Recommendations. (July 1997) Volume 1: Baseline Human Health Risk Assessment. (May 1998)

The Avila Beach Health Study Phase 1, Volume 2: Environmental Monitoring. (May 1998)

Phase 2 Human Health Risk Assessment, Teledyne Inc., San Diego, Ca. (February 1997)

Determination of Occupational Lead Exposure at a Tire Shop in Placerville, Ca. (April 1993)

Development of an Environmental Code of Regulations for Hazardous Waste Treatment Facilities on La Posta Indian Tribal lands, San Diego County, Ca. (August 1992)

Sampling and Analysis Plan, Health and Safety Plan, Site Characterization of Lead Oxide Contaminated Areas, Mare Island Naval Shipyard, Vallejo, California. Prepared in conjunction with Kaman Sciences Corp. (September 2, 1988)

Mercury Contamination

Dr. Greenberg has prepared and/or reviewed several human health and ecological risk assessments regarding mercury contamination in soils, sediments, and indoor surfaces. Dr. Greenberg served on the State Water Resources Control Board Bay Protection and Toxic Cleanup Program Advisory Committee from 1994 until the end of the program in 1999.

Examples

Review and evaluation of a human health risk assessment of ingestion of sport fish caught from San Diego Bay and which contain tissue levels of mercury and PCBs (November 2004 – present)

Screening Human Health Risk Assessment, Calculation of Soil Clean-up Levels, and Aquatic Ecological Screening Evaluation, Galilee Harbor, Sausalito, Ca. (May 1998)

Health Risk Assessment for Residual Mercury at the Deer Creek Facility, 3475 Deer Creek Road, Palo Alto, California. (July 1997)

Human Health Risk Assessment Due to Emissions from a Medical Waste Incinerator, prepared for Kauai Veterans Memorial Hospital, Kauai, Hawai'i (1994)

Exhibit 317

**DECLARATION OF
ALVIN J. GREENBERG, Ph.D**

I, **Alvin J. Greenberg, Ph.D** declare as follows:

1. I am presently a consultant to the California Energy Commission, Siting, Transmission, and Environmental Protection Division.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I helped prepare the staff testimony on **Appendix BIO1 – Biological Resources Risk Assessment of Avian Exposure to Concentrated Solar Radiation** for the **Hidden Hills Solar Electric Generating System [HHSEGS] (11-AFC-2)** project based on my independent analysis of the Application for Certification and any supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.
5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: Feb. 25, 2015 Signed: 

At: San Rafael, California

Exhibit 318

DECLARATION OF RICK TYLER

I, **Rick Tyler** declare as follows:

1. I am presently employed by the California Energy Commission in the Siting, Transmission and Environmental Protection Division as a **Sr. Mechanical Engineer**.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I helped prepare the staff testimony on **Hazardous Materials Management**, on **Worker Safety / Fire Protection**, and on **Appendix BIO1 – Biological Resources Risk Assessment of Avian Exposure to Concentrated Solar Radiation and Appendix BIO2 – Procedural Model and Calculations Used to Estimate Avian Exposure to Concentrated Solar Radiation** for the **Hidden Hills Solar Electric Generating System [HHSEGS] (11-AFC-2)** project based on my independent analysis of the Application for Certification and any supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.
5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 2/25/13 Signed: _____

At: Sacramento, California

Exhibit 319

DECLARATION OF GEOFFREY LESH

I, **Geoffrey Lesh** declare as follows:

1. I am presently employed by the California Energy Commission in the Siting, Transmission and Environmental Protection Division as a **Mechanical Engineer**.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I helped prepare the staff testimony on **Hazardous Materials Management**, on **Worker Safety / Fire Protection**, and on **Appendix BIO1 – Biological Resources Risk Assessment of Avian Exposure to Concentrated Solar Radiation and Appendix BIO2 – Procedural Model and Calculations Used to Estimate Avian Exposure to Concentrated Solar Radiation** for the **Hidden Hills Solar Electric Generating System [HHSEGS] (11-AFC-2)** project based on my independent analysis of the Application for Certification and any supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.
5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 2/25/2013

Signed: _____

At: _____

Sacramento, California



Exhibit 320

**STAFF REBUTTAL: REVISED CONDITIONS OF CERTIFICATION
Noxious Weeds, Special-status Plants, Waters of the State, and
Groundwater-Dependent Ecosystems**

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REVISED CONDITIONS OF CERTIFICATION BIO-18 TO BIO-23 2

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STAFF REBUTTAL: REVISED CONDITIONS OF CERTIFICATION Noxious Weeds, Special-status Plants, Waters of the State, and Groundwater-Dependent Ecosystems

INTRODUCTION

Staff reviewed the Applicant's proposed revisions to the following conditions of certification contained in the Applicant's Opening Testimony¹ for consistency with the analysis and conclusions in the FSA, and to assess whether impacts to these biological resources would be reduced to less than significant levels with adoption of the proposed revisions:

- BIO-18** (Weed Management Plan);
- BIO-19** (Special-status Plant Avoidance & Minimization Measures);
- BIO-20** (Special-Status Plant Compensatory Mitigation Plan);
- BIO-21** (Botanist Qualifications and Duties);
- BIO-22** (State Waters Compensatory Mitigation and Impact Avoidance & Minimization Measures); and
- BIO-23** (Groundwater-Dependent Vegetation Monitoring Plan)

A summary of the areas of agreement and disagreement was provided in Staff's Rebuttal Testimony². Staff's revised conditions of certification shown below were made to the applicant's strike-out version of the conditions, and indicate changes acceptable or unacceptable to staff as follows:

Staff's Revisions:

New text introduced by staff is shown below in red underline. New deletions made by staff are shown in ~~red, strike-through font~~.

Areas of Disagreement:

New text introduced by the Applicant that is *not* acceptable to staff is shown in ~~red, bold, underline strike-through font~~. Applicant deletions that are *not* acceptable to staff are indicated by red, bold, underlined font.

Areas of Agreement:

Applicant deletions acceptable to staff are shown with ~~blue bold underline strike-through font~~. New text introduced by the Applicant that is acceptable to staff is shown in blue, bold, underline.

¹ CH2M Hill 2013 - Applicant's Opening Testimony, Exhibit 71, pp. 97-128. Docketed January 22, 2103 (tn:99215). Online: http://www.energy.ca.gov/sitingcases/hiddenhills/documents/applicant/2013-01-22_Applicants_Opening_Testimony_Exhibit_71_TN-69215.pdf

² California Energy Commission (CEC) 2013 – CEC Staff's Rebuttal Testimony, pp. 13-27. Docketed February 12, 2013 (tn:96495). Online: http://www.energy.ca.gov/sitingcases/hiddenhills/documents/2013-02-11_CEC_Staffs_Rebuttal_Testimony_TN-69495.pdf

Staff's revised Conditions of Certification BIO-20 also reflect a consideration of the California Native Plant Society's (CNPS) concerns about the mitigation for gravel milkvetch (*Astragalus sabulonum*) in a comment letter received February 4, 2013³.

REVISED CONDITIONS OF CERTIFICATION BIO-18 TO BIO-23

BIO-18: WEED MANAGEMENT PLAN

~~This condition requires that the Applicant monitor and control weeds off-site. Changes to this condition have been made to clarify that weed control monitoring or weed control activities will not be performed offsite since the Applicant has no control over that property. Paragraph 6, requesting additional funding, has been struck entirely. As stated in page 19 of the Socioeconomics section of the FSA, "With the inclusion of Conditions of Certification as described in Biological Resources section requiring HHSEGS to develop and implement a weed management plan, it is expected that additional weed management by the County will not be necessary."~~

BIO-18 To minimize the potential indirect effects of weeds on biological resources adjacent to the project, the project owner shall submit a draft Weed Management Plan subject to review and approval by the Compliance Manager (CPM). The general objective of the Weed Management Plan shall be to: 1) manage or contain weed species of greatest environmental concern for the life of the project to prevent their spread into adjacent offsite habitat, and 2) prevent the accidental introduction of new weed species from contaminated vehicles and equipment entering the site during construction or soil disturbing activities.

"Target" weed species or weed populations for long-term management, and those that are infeasible to control or a low priority shall be determined through an ecological risk assessment such as *Criteria for Categorizing Invasive Non-Native Plants that Threaten Wildlands* (2003)⁴, California Exotic Pest Plant Council *An Invasive Species Assessment Protocol: Evaluating Non-Native Plants for Their Impact on Biodiversity* (The Nature Conservancy 2004)⁵, or weed risk assessment criteria developed by the Bureau of Land Management (BLM) or U.S. Forest Service. for long to be included in the Weed Management Plan term containment The term "weeds" as used in this condition includes weed species identified by: California Invasive Plant Council (Cal-IPC); California Department of Food and Agriculture; and BLM California. shall include any weed occurring within the WMAs described above that meets the following definition: a) California Invasive Plant Council (Cal-IPC) "High"-rank weeds (excluding grass species such as red brome and

³ California Native Plant Society (CNPS) – Public Comment from California Native Plant Society regarding inadequacy of mitigation requirements for *Astragalus sabulonum* in the CEC Final Staff Assessment for Hidden Hills SEGS. Docketed February 4, 2013 (tn:69390). Online:

[http://www.energy.ca.gov/sitingcases/hiddenhills/documents/others/2013-02-](http://www.energy.ca.gov/sitingcases/hiddenhills/documents/others/2013-02-04%20California%20Native%20Societys%20Comments%20on%20CEC%20Final%20Staff%20Assessment%20TN-69390.pdf)

[04 California Native Plant Societys Comments on CEC Final Staff Assessment TN-69390.pdf](http://www.energy.ca.gov/sitingcases/hiddenhills/documents/others/2013-02-04%20California%20Native%20Societys%20Comments%20on%20CEC%20Final%20Staff%20Assessment%20TN-69390.pdf)

⁴ Warner, Peter J., Carla C. Bossard, Matthew L. Brooks, Joseph M. DiTomaso, John A. Hall, Ann M. Howald, Douglas W. Johnson, John M. Randall, Cynthia L. Roye, Maria M. Ryan, and Alison E. Stanton. 2003. *Criteria for Categorizing Invasive Non-Native Plants that Threaten Wildlands*. California Exotic Pest Plant Council and Southwest Vegetation Management Association. 24 pp. Online: <http://www.cal-ipc.org/ip/inventory/pdf/Criteria.pdf>

⁵ Morse, L.E., J.M. Randall, N. Benton, R. Hiebert, and S. Lu. 2004. *An Invasive Species Assessment Protocol: Evaluating Non-Native Plants for Their Impact on Biodiversity*. [v1]. The Nature Conservancy. Arlington, Va. Online:

<http://www.natureserve.org/library/invasiveSpeciesAssessmentProtocol.pdf>

~~cheatgrass that are ranked by Cal-IPC as “High” but are so widespread that they are not feasibly controlled); b) California Department of Food & Agriculture (CDFA) and Nevada Department of Agriculture (NDA) “A” rated and “B” rated weeds, and c) all weeds on the Federal weed list.~~ Only the species of greatest environmental concern and/or limited distribution onsite shall be mandated for **control and/or** eradication. Weed management is not required for common and widespread weed species.

The draft weed management plan shall include the following:

1. Weed Plan Requirements. The draft plan shall include the following information: a) specific weed management objectives and measures for each target non-native weed species; b) description of the baseline conditions; c) maps **of the weed management and monitoring areas** showing locations of existing populations of target weeds **or weed populations**; d) weed risk assessment based on Cal-IPC⁶, Nature Conservancy⁷; BLM, or USFS ~~other acceptable~~ criteria, ~~and~~ e) measures that would be used to contain, manage, or monitor identified priority weed species; f) measures that would be used to prevent the introduction and spread of weeds on vehicles, equipment, and materials (e.g., infested seed, straw, gravel, etc.); g) measures to minimize the risk of unintended harm to wildlife and other plants from weed control activities; h) monitoring and surveying methods; and i) reporting requirements. **Maps of all weeds found onsite contained in the botanical surveys⁸ shall be attached as an appendix to the Weed Plan.**
2. Avoidance and Treatment of Dense Weed Populations. The draft plan shall include guidelines for avoiding or treating dense populations of the weed species identified as priorities for containment. If grading and construction cannot avoid the **highest priority target weed species worst**, they shall be contained by one of the following methods **to be selected by the project owner**: a) requiring tires of vehicles and equipment operating in infested areas to be cleaned before leaving the infested area; **or** b) treating the infested areas in the season prior to construction and spraying the new crop of plants that emerge in early spring. ~~c) removing the upper 2 inches of soil and disposing it offsite at a sanitary landfill or other site approved by the County Agricultural Commissioner, or d) burying the infested soil, e.g., under the solar facility or in a pit, and covering the infested soil with at least three feet of uncontaminated soil.~~
3. Cleaning Vehicles and Equipment. The draft plan shall include specifications and requirements for establishing a cleaning station for removal of weed seed and weed plant parts from vehicles and equipment entering and leaving the site **during construction**. Vehicles and equipment working in weed-infested areas (including previous job sites) shall be required to clean the equipment tires, tracks, and

⁶ Warner, Peter J., Carla C. Bossard, Matthew L. Brooks, Joseph M. DiTomaso, John A. Hall, Ann M. Howald, Douglas W. Johnson, John M. Randall, Cynthia L. Roye, Maria M. Ryan, and Alison E. Stanton. 2003. *Criteria for Categorizing Invasive Non-Native Plants that Threaten Wildlands*. California Exotic Pest Plant Council and Southwest Vegetation Management Association. 24 pp. Online: <http://www.cal-ipc.org/ip/inventory/pdf/Criteria.pdf>

⁷ Morse, L.E., J.M. Randall, N. Benton, R. Hiebert, and S. Lu. 2004. *An Invasive Species Assessment Protocol: Evaluating Non-Native Plants for Their Impact on Biodiversity*. [v1]. The Nature Conservancy. Arlington, Va. Online: <http://www.natureserve.org/library/invasiveSpeciesAssessmentProtocol.pdf>

⁸ CH2M Hill 2011. *Spring 2011 Botanical Resource Survey of the Hidden Hills Solar Electric Generating System Site*, Appendix A. Applicants Data Response Set 1B-2 (tn: 63262).

undercarriage before entering the project area. ~~and before moving from infested areas of the project site to uninfested areas.~~ The washing station shall be sized to accommodate large vehicles and construction equipment. Security or cleaning station staff will actively monitor vehicles and provide records in the monthly logs. Cleaning shall adequately remove all visible dirt and plant debris. ~~Cleaning using hand tools, such as brushes, brooms, rakes, or shovels, is preferred.~~ If water must be used to clean vehicles, the water/slurry shall be contained to prevent seeds and plant parts from washing into adjacent habitat/offsite.

4. Treatment of Weed Populations near Special-status Plants. The draft plan shall include a requirement to prioritize the containment of invasive target non-native weeds onsite that occur onsite and within 100 feet of any of the nine offsite special-status plant occurrences immediately adjacent to the project boundary. Weeds that are located offsite will not be controlled. The draft plan shall also include measures for preventing accidental harm to the adjacent offsite occurrences during spraying or other weed management activities according to the guidelines in #6, below. The plan shall not include spraying or mechanical treatments of common and widespread weeds around the perimeter to avoid harming wildlife; the focus shall instead be on spot treatment of new outbreaks and small populations of the most invasive species, and according to the guidelines for wildlife-safe herbicide use described under #7 and #8, below.
5. Employee Weed Awareness Training. A program shall be developed and incorporated into the WEAP and BRMIMP to train construction and operation employees to recognize the most common and most invasive species in the area, how to avoid contaminating vehicles and equipment, how to avoid spreading weeds offsite or introducing new weed species onsite, and how to protect wildlife and adjacent offsite special-status plant occurrences from accidental harm during weed management activities. Employees shall be trained to understand the common vectors and conduits for spread, the economic and ecological impacts of weeds, and trained on procedures for reporting infestations.
6. Compensate Local Agencies for Increased Weed Monitoring and Abatement. The project owner and the Inyo/Mono Agricultural Commissioner shall establish an amount for a fee to be paid annually by the project owner to the local agency for increased offsite monitoring and abatement costs resulting from the construction and operation of the project. ~~A summary of California's weed laws is available online: <http://www.cdfa.ca.gov/plant/ipc/encycloweedia/winfo_weedlaws.htm>~~
7. Safe Use of Herbicides. The draft plan shall include a list of herbicides and soil stabilizers that will be used on the project with manufacturer's guidance on appropriate use. The draft plan shall indicate under what circumstances herbicides will be used, and what techniques will be used to avoid chemical drift. Guidance for safe herbicide use is available in *Safe Herbicide Handling in Natural Areas* (Hillmer et al. 2003). Only weed control measures for target weeds with a demonstrated record of success shall be used, based on the best available information from sources such as The Global Invasive

Species Team “Invasipedia”⁹, Cal-IPC Invasive Plant Profiles¹⁰, and the California Department of Food & Agriculture Encyclopedea¹¹.

8. Weed Control Methods. The methods for weed control described in the draft plan shall meet the following criteria:
 - a. Manual: Seed heads and plants removed manually must be disposed of in accordance with guidelines from the Inyo County Agricultural Commissioner (or Clark or Nye County commissioners if disposed in Nevada).
 - b. Chemical: Herbicides known to have residual toxicity, such as soil fumigants and certain pre-emergent herbicides ~~pre-emergent herbicides~~ and pellets shall not be used. Only post- and pre-emergent herbicides known to have minimal toxicity to birds and other wildlife shall will be used in weed control. This includes selective or non-selective types depending on target weed species. In sensitive areas immediately adjacent to offsite special-status plant occurrences, sprayers shall be operated at low pressure or with a shield attachment to control drift, and spraying conducted on windless days;
 - c. Biological: Biological methods, if used, shall be subject to agency review to avoid inadvertent naturalizing, hybridizing with native species;
 - d. Mechanical: Mechanical trimmers shall not be used during periods of high fire risk or shall only be implemented during early morning hours when the fire risk is lowest. Contact information for the local fire department and Cal-Fire shall be clearly posted at all times. A live water supply, shovels, and fire extinguishers shall be available at all times during mowing and other mechanical weed controls.

Verification: At least 90 days prior to the start of any project-ground disturbing activity, the project owner shall submit the draft Weed Management Plan to the CPM for review and approval. No less than 30 days prior to the start of any project-ground disturbing activity, the project owner shall provide the CPM with the final version of the Weed Management Plan. Any modifications to the approved plan shall be made only after approval by the CPM.

No less than 60 days prior to start of any project-related ground disturbance activities, the project owner shall provide the CPM with a copy of an agreement between the project owner and local agricultural commissioner(s) regarding compensation for increased weed monitoring and abatement costs, and provide written evidence that the first annual fee has been paid.

Within 60 days after completion of project construction, the project owner shall provide to the CPM for review and approval a written report identifying which items of the Weed Management 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.

⁹<http://wiki.bugwood.org/Invasipedia>

¹⁰http://www.cal-ipc.org/ip/management/plant_profiles/index.php

¹¹http://www.cdffa.ca.gov/plant/ipc/encyclopedea/encyclopedea_hp.htm

As part of the Annual Compliance Report, each year following construction the Designated Biologist shall provide a report to the CPM that includes: a) a summary of the results of noxious weed surveys and management activities for the year; b) discussion and documentation of progress in meeting management goals for target weed species; whether weed management goals and objectives for the year were met; c) documentation that weeds targeted for containment did not spread offsite (beyond existing background levels for species that also occur offsite); documentation that methods were employed to prevent accidental harm to adjacent sensitive resources, and d) recommendations for weed management activities for the upcoming year.

BIO-19: SPECIAL-STATUS PLANT IMPACT AVOIDANCE AND MINIMIZATION MEASURES

~~The Applicant requests that Condition BIO-19 be revised to clarify protection of special status plants located off-site. In addition, language in paragraph (a) on modification of construction methods is already discussed in BIO-8, General Impact Avoidance and Minimization Measures. To avoid redundancy, and possible discrepancies in mitigation language if measures are included in several different Conditions, BIO-19 should just reference BIO-8 rather than reiterate details here. The rest of the paragraph has therefore been removed. This approach is consistent with BIO-19 (d) which describes weed control measures (by referencing the original measure, and then this COC does not provide the details).~~

~~In the description of verification section, the requirement to monitor the temporary ESAs for the life of the project has been changed to “during construction”. A perimeter fence will be installed permanently demarking the project boundary and no construction equipment or personnel will be working outside the fence. Monitoring the temporary ESA signage for the life of the project for avoidance of construction impacts is unnecessary.~~

~~Paragraphs (a) and (f), requesting that spoil piles or laydown areas or other project construction elements be placed at least 100 feet from any offsite special status plants, and modify construction methods in these areas, would place excessive constraints to construction activities around a 100 foot wide swath within the entire project site for an offsite resource that will already be protected through an ESA designation. These paragraphs have therefore been deleted. Minor changes and clarifications to the condition language below have also been added.~~

BIO-19 The project owner shall prevent accidental impacts to known special-status plant occurrences offsite that are in close proximity (within 100 feet) to project activities through the measures described below. The project owner is not responsible for managing or monitoring special-status plant occurrences offsite. The project owner shall incorporate all measures for protecting offsite special-status plants in close proximity (within 100 feet) to the site into the BRMIMP (BIO-7). These measures shall include the following elements:

- a. ~~Modify construction techniques: Incorporate modifications to construction techniques to avoid accidental and indirect impacts to special status plants around the project perimeter. Examples include: limiting the width of the work area; adjusting the location of staging areas, lay downs, secondary access roads; and modifying the location of discharge points of any diverted channels to maintain existing surface drainage patterns.~~
- b. Establish Environmentally Sensitive Areas (ESAs). Prior to the start of any ground- or vegetation-disturbing activities, the Biological Monitor shall designate establish special-

~~status plants located outside of the project and adjacent to the project boundary as~~ temporary Environmentally Sensitive Areas (ESAs) to protect ~~the~~ offsite ~~special-status plant~~ occurrences within 100 feet of the project boundary from accidental impacts during construction and operation. The location of the adjacent offsite occurrences shall be marked at the project boundary with ~~temporary construction fencing and~~ temporary signage during construction ~~activities in close proximity to the offsite occurrences~~. The adjacent offsite occurrences shall also be clearly depicted on construction drawings as ESAs. As part of regular monitoring activities, the Biological Monitor will verify that ESA signage is in good repair and, by doing so, will verify that avoidance of offsite special-status plant occurrences is performed during construction.

- c. Worker Environmental Awareness Program (WEAP). The WEAP (BIO-6) shall include a requirement for informing employees and contractors about the presence of ~~the special-status plant ESAs adjacent offsite special-status plant occurrences~~ and components specific to protection avoidance of ~~ESAs special-status plants as outlined in this condition~~.
- d. Herbicide and Soil Stabilizer Drift Control Measures. Special-status plant occurrences offsite shall be protected from potential herbicide drift as described in the Weed Management Plan (BIO-18), and through implementation of standard air quality and dust control measures, they shall also be protected from fugitive dust and soil stabilizer drift.
- e. Avoid Weed Contaminated Erosion and Sediment Control Materials. Any seed mixes used for erosion control shall not include invasive plants. Erosion-control seed mixes, straw, and other mulches, if used, shall be certified weed-free. These specifications shall be incorporated in the Drainage, Erosion, and Sedimentation Control Plan required under SOIL-1.
- f. Locate Spoil Piles and Equipment Re-Fueling and Maintenance Staging, Parking, Spoils, and Storage Areas Away from Special-Status Plant Occurrences. Spoil piles and equipment re-fueling and maintenance areas, vehicles, and materials storage areas, parking areas, equipment and vehicle maintenance areas, and wash areas shall be placed at least 100 feet from any offsite special-status plant occurrences.
- g. Monitoring and Reporting Requirements. During construction, ~~t~~The Designated Biologist shall conduct regularly scheduled monitoring of the ESAs and other measures designed to protect avoid inadvertent trespass offsite where adjacent offsite special-status plant occurrences are located, ~~during construction activities in close proximity~~. The monitoring report shall include: a) dates of worker awareness training sessions and attendees; b) map showing the location of all special-status plant occurrences within 100 feet of the project boundary (including linears and access roads); c) location and description of the ESA signs, other avoidance measures implemented (e.g., dust control or relocation of spoils and refueling areas); d) description of the status, health, and threats to special-status plant occurrences adjacent to the project boundary; ed) location description of any ~~unanticipated or~~ unpermitted adverse impacts trespass into ESAs to occurrences and any remedial corrective action taken; and ~~ef)~~ outstanding follow-up items and recommendations for remedial action in the next year.

Verification: The Monthly Compliance Reports prepared by the Designated Biologist during construction shall include documentation that the special-status plant ESAs were designated on construction drawings, and temporary ESA signage was installed and is in operational condition special-status plant avoidance and minimization measures were implemented as described in this condition.

The project owner shall submit a monitoring report every year during construction for the life of the project according to the specifications listed above to monitor effectiveness of protection temporary during-construction avoidance measures for all-avoided the special-status plants ESAs to the CPM.

BIO-20: SPECIAL-STATUS PLANT COMPENSATORY MITIGATION PLAN

~~BIO-20 describes compensatory mitigation for the special-status plants for which impacts are considered significant. Taking into account the 2:1 and 3:1 mitigation ratios proposed in BIO-20, acquisition of several parcels of private land would be required. Based on the Applicant's experience with special-status plant land acquisition, and the low percentage of private landownership in Inyo County, this amount of private land acquisition will be extremely difficult. First, access agreements and permission to survey must be obtained. Then, surveys performed on numerous properties (and this can be a multiple year effort, should drought conditions occur) to find the needed number of special-status plant occurrences with habitat conditions the same or better than those impacted. Next, after special-status plants are confirmed on a percentage of the properties surveyed, some small number of landowners would be expected to be willing to sell their land. Based on the experience with finding suitable lands for the ISEGS project, it may take three years to complete these tasks, particularly if there is a drought year when plants cannot be detected and surveys are delayed. For these reasons, language that adds other mitigation options to increase flexibility, and adjustments to the timeline to complete the mitigation process, have also been proposed.~~

~~As described in BIO-20, there is high potential for Torrey's joint-fir to be considerably more common than currently known. To address this, BIO-20 allows pre-construction surveys for Torrey's joint-fir. Compensatory mitigation for this species will be adjusted based on results of surveys. Gravel milkvetch, Preuss' milkvetch, and Wheeler's skeletonweed also have high potential to occur offsite in higher numbers than currently known. For example, Gravel milkvetch was not even added to the CNPS List until October 2011, after 2011 site surveys were completed. Additional offsite surveys were performed for these species in 2012, but the survey findings were strongly and negatively influenced by the drought conditions. Due to the drought in 2012, opportunities to find additional occurrences of the other special-status species were limited as well. Changes to BIO-20 have been made so that any new findings for these three special-status plants will be treated the same as Torrey's jointfir, and results of surveys will be incorporated into the final compensatory mitigation developed for the project.~~

~~In addition, BIO-20 has been revised to include mitigation flexibility to address local land tenure considerations in the project region and feasibility.~~

BIO-20 To mitigate for significant impacts to special-status plants that occur on the project site, the project owner shall implement mitigation to offset the impact as described below. Because the condition allows for future offsite surveys to identify new occurrences, and the adjustment of mitigation ratios if new offsite occurrences are found, a range of

options was provided with detailed performance standards for each option. Due to the resulting length of the condition, it has been subdivided into the following subsections:

- A. Mitigation through Acquisition and Preservation**
- B. Mitigation through Restoration and Enhancement**
- C. Mitigation through Avoidance**
- D. Other Provisions**

~~“Other Provisions” includes performance standards for future surveys and adjusting mitigation ratios, and seed collection. An **in-lieu** option for fulfilling mitigation through **payments** to an approved third-party land trust or public agency was also included **as described below.** One or more mitigation options may be could be implemented to fulfill the mitigation obligations. ~~mitigation ratios and~~ requirements described below. These options include: a) acquisition of mitigation lands containing viable occurrences that meet the criteria and performance standards described below, and protecting those occurrences in perpetuity under a conservation easement, ~~or b) **enhancement**/restoration of at-risk occurrences, according to the criteria and performance standards described below, or c) avoidance of occurrences located on the project boundary. An **in-lieu** option for fulfilling acquisition and/or restoration through **payments** to an approved third party land trust or public agency are included **as described below.** The project owner shall provide funding for the acquisition and long-term maintenance and management of the acquired lands as described below.~~~~

Subsection A: Mitigation through Acquisition and Preservation

- 1) ~~Selection Criteria and **Compensatory** Mitigation Ratio for Compensation Lands.~~ If the project owner elects to mitigate for significant impacts to **three of the** four species (**gravel milk-vetch**, Wheeler’s skeletonweed, Torrey’s joint-fir, and Preuss’ milk-vetch) **shall be mitigated** by acquiring and preserving offsite occurrences under a permanent conservation easement, ~~t~~**hree** offsite occurrences shall be protected for every S1 (“critically imperiled”) species affected and two offsite-occurrences protected for every S2 (“imperiled”) species affected. Range ranks (e.g., an S1S2 rank) shall defer to the more imperiled rank. Because impacts to gravel milk-vetch (an S2 rank species) will affect half (four occurrences) of all presumed extant occurrences statewide (eight total), a total of four offsite occurrences shall be protected through acquisition and preservation (see explanation in the Staff Rebuttal, page 14-15, tn-69495). The restoration option (subsection B) and the option for avoidance of perimeter occurrences (subsection C) may be used to fulfill this obligation if there are insufficient opportunities for acquisition. Acquisition lands containing more than one of the affected species shall be credited for both species. Integration of special-status plant mitigation land with other mitigation lands is described below.

The compensation lands selected for acquisition must meet the following selection criteria: a) 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 adequate to sustain the population, and b) shall be of equal or better habitat quality than that of the affected occurrence. ~~unless restoration/enhancement actions are proposed to the acquisition property.~~ The occurrence of the target special-status

plant on the proposed acquisition lands should be viable, stable or increasing, or be made so, with implementation of restoration/enhancement actions.

- 2) Review and Approval of Compensation Lands Prior to Acquisition. A Draft Special-status Plant Mitigation Plan (Plan) shall be prepared subject to review and approval of the CPM prior to acquisition. The Draft Plan shall discuss the suitability of the proposed parcel(s) as compensation lands for special-status plants in relation to the criteria listed above. The project owner shall submit the final Plan and formal acquisition proposal to the CPM describing the parcel(s) intended for purchase, and must be approved by the CPM.
- 3) Management Plan. The project owner, or approved third party as described below under “Title and Conveyance”, 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 maintain the long-term viability of the target special-status plant occurrences to be viable, stable, or increasing. The management plan shall also include long-term monitoring and reporting on the implementation, effectiveness and compliance with the conservation goals and objectives of the mitigation. The Management Plan shall be submitted for review and approval to the CPM.
- 4) 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. Mitigation obligations for special-status plants shall not be fulfilled by nesting with other mitigation lands if the lands do not meet all the criteria and performance standards described in this condition. Potential mitigation lands containing more than one of the significantly affected species would be credited for both species, i.e., one parcel could be used to fulfill the mitigation obligations for more than one special-status plant species providing the parcel met all the selection criteria. If mitigation lands contain more than one special-status plant occurrence or multiple special-status plant species then credit will be given for multiple occurrences.
- 5) 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, 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.
 - 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 a non-profit organization qualified to hold title to

and manage compensation lands (pursuant to California Government Code section 65965), or to CDFG 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 the deed holder approved by the CPM. The CPM may require that another entity approved by the CPM 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, if habitat improvement is necessary. These activities will vary depending on the condition and location of the land acquired, but may include: initial enhancement (e.g., signs, fencing, protection from off-road vehicles); restoration actions needed to maintain the viability of the occurrences (e.g., removal of invasive species, barricading and decommissioning off-road vehicle trails, protection from herbivores, managing public access, enforcement); and monitoring and reporting on implementation, effectiveness and compliance with the conservation goals and objectives of the mitigation. For determining the amount of security, the cost of these activities ~~would~~ use the estimated cost per acre for Desert Tortoise mitigation as a best available proxy or other estimates proposed by the project owner and approved by the CPM. The actual costs will vary depending on the measures that are required for the compensation lands and shall be determined by a Property Analysis Record (PAR) or similar analysis. A non-profit organization 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), and if it meets the approval of the CPM.
- 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 deposit into an account managed by a land trust or other non-profit organization to fund a capital long-term maintenance and management fee (endowment) in the amount determined through the Property Analysis Record (PAR) or PAR-like analysis conducted for the compensation lands. The CPM may designate another non-profit organization to hold the long-term maintenance and management fee if the organization is qualified to manage the compensation lands in perpetuity.
- f. Interest, Principal, and Pooling of Funds. The project owner shall ensure that an agreement is in place with the long-term maintenance and management fund (endowment) 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 related to the special-status plants.
 - 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 target 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 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.
- g. 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 an approved third party, escrow fees or costs, and environmental contaminants clearance, ~~and other site cleanup measures.~~
- h. 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 financial security (“Security”) approved by the CPM. The estimated acquisition costs and amount of the security ~~shall~~may be calculated based on the estimated cost per acre for Desert Tortoise mitigation or other estimate as approved by the CPM as a best available proxy. 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 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.

- i. Conservation Easements and Other Deed Restrictions. If acquisition and preservation is accomplished through conservation easements or other deed restrictions that go with the land, as an alternative to fee title, the easement shall meet the following performance standards: 1) the easement shall be large enough to maintain the viability of the occurrence and protect it from edge effects; 2) stewardship fees shall be adequate to manage and defend the easement; and 3) ongoing oversight and accountability shall be ensured through monitoring and reporting requirements of the easement holder. Conservation easements held by a third party land trust or public agency, and other deed restrictions shall be obligated to fulfill all performance standards described above. The approved third party shall submit an annual report to the CPM on the health and status of the protected occurrence as described below.

Other deed restrictions, such as restrictive covenants, are acceptable only if the project owner demonstrates that no third party land trust or public agency was available to accept the easement. Under these circumstances, the project owner shall be responsible for managing the occurrence under deed restrictions according to the performance standards described above for initial protection and enhancement and long-term management until transferred to an approved third party under a conservation easement. The project owner shall monitor the occurrence(s) and submit an annual report to the CPM that includes a qualitative and quantitative report on the occurrence health and status, actions taken to enhance and protect the occurrence, a description of remedial actions taken or proposed, and contact information for the responsible parties.

Subsection B: Mitigation through Restoration and Enhancement

1. Criteria for Mitigation ~~compensation~~ through Enhancement/Restoration of At-Risk Occurrences. As an alternative or adjunct to acquisition of compensation lands, the project owner may undertake or fund habitat enhancement or restoration for at-risk occurrences of the target special-status plant species. Examples of suitable restoration projects include but are not limited to the following: a) control of unauthorized vehicle use into an occurrence; b) control of invasive non-native plants that pose an immediate threat to an occurrence; c) fencing to exclude grazing by wild burros or livestock from an occurrence; d) protection from other herbivores (e.g. lagomorphs) if damaging to the occurrence, or e) restore lost or degraded hydrologic or geomorphic functions critical to the species (e.g., restoring previously diverted stream flows, removing obstructions to the wind sand transport corridor above an occurrence, or increasing groundwater availability for dependent species). Ex-situ mitigation through transplanting or replacement planting is not an acceptable mitigation option due to the high rate of failure.
2. Performance Standards. 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/enhancement/restoration of an off-site occurrence that is currently in decline to a stable or increasing status. The NatureServe threat ranking system, or another equivalent system approved by the CPM, may be used to evaluate threats to the occurrence that is currently assessed, based on the NatureServe threat ranking system, with one or more of the following: 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/Enhancement/rRestoration would be considered successful if it achieves an improvement in the occurrence trend as measured using the NatureServe ranking system, or other approved equivalent threat-ranking system to a stable or increasing status, as defined by the approved threat-ranking system. to “stable” or “increasing” status, or downgrading of the overall threat rank to slight or low (from “High” to “Very High”).

3. Mitigation Security. The project owner shall provide financial assurances to the CPM to guarantee that an adequate level of funding is available to implement the restoration/enhancement project. 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 financial security (“Security”) approved by the CPM. The amount of the security shall be based on the estimated total cost for the restoration project, including implementation, monitoring, and contingency measures. The implementation and monitoring of the restoration may be undertaken by an appropriate third party, or the project owner may fund an agency to implement the restoration, subject to approval by the CPM. Any restoration undertaken on private lands must be protected in perpetuity under a conservation easement.
4. Prepare Enhancement/Restoration Plan. If the project owner elects to undertake an enhancement/restoration project for mitigation, they shall submit an Enhancement/Restoration Plan to the CPM for review and approval. The Enhancement/Restoration Plan shall include each of the following components:
 - a. Goals, Objectives, and Performance Standards. 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 enhancement/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 threat trend compared to pre-enhancement/restoration conditions using NatureServe or other threat-ranking system. to “stable” or “increasing” status, or downgrading of the overall threat rank to slight or low (from “High” to “Very High”).
 - b. Baseline, Historical, and Desired Conditions. Provide a description of the pre-project baseline conditions (prior to the start of restoration), an estimate of the pre-impact historical conditions (before the site was degraded by weeds or grazing or ORV, etc.), and the desired conditions.
 - c. 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).

- d. Ecological Factors. Describe other important ecological factors of the species being protected, restored, or enhanced such as total population, reproduction, distribution, pollinators, etc.
- e. 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/restoration project must be completed within five years of the start of construction of the completion of construction.
- f. Budget. Provide a detailed budget and time-line, and develop clear, measurable, objective-driven annual success criteria.
- g. Monitoring. Develop clear, measurable monitoring methods that can be used to evaluate the effectiveness of the enhancement/restoration and the benefit to the affected species. The Plan shall include a minimum of five years of quarterly monitoring, ~~and then a longer term annual monitoring component for the remainder of the enhancement/restoration project, and~~ until the performance standards for rescue of a threatened occurrence for restoration of the threatened occurrence are met. ~~At a minimum the progress reports shall include: quantitative measurements of the projects' progress in meeting the enhancement/restoration project success criteria, detailed description of remedial actions taken or proposed, and contact information for the responsible parties.~~
- h. Reporting Program. ~~The Plan shall ensure accountability with a reporting program that includes progress toward goals and success criteria. Include names of responsible parties. The project owner shall submit annual~~At a minimum the progress reports ~~that~~shall include: quantitative measurements of the projects' progress in meeting the enhancement/restoration project success criteria, detailed description of remedial actions taken or proposed, and contact information for the responsible parties.
- i. Contingency Plan. Describe the contingency plan for failure to meet **annual success criteria**~~goals~~.
- j. Long-term Protection. Include proof of long-term protection for the restoration site. For private lands this ~~would~~ **could** include conservations easements or other deed restrictions.~~;~~Projects on public lands must be protected under a Wilderness designation, Bureau of Land Management (BLM), BLM Area of Critical Environmental Concern (ACEC), BLM Desert Wildlife Management Area (DWMA), BLM or other agency Research Natural Area, National Park lands, or State Park lands, or under a conservation easement or equivalent protection on Department of Defense lands.

Subsection C: Mitigation through Avoidance

1. Mitigation through Avoidance of Perimeter Occurrences. The project may elect to mitigate impacts to gravel milk-vetch in part through avoidance of occurrences located along the project boundary under the following conditions: a) the avoidance includes a buffer surrounding the occurrence that is adequate, subject to approval by the CPM, for maintaining the long-term viability of the occurrence, and b) the avoided occurrence and its buffer are placed under a permanent conservation easement and protected and managed as described for mitigation through acquisition in subsection A, above. An “adequate buffer” shall ensure protection from the edge effects of the project (no less than a 100-foot setback from the project development) and can protect the ecosystem processes necessary for maintaining the habitat.

Subsection D: Other Provisions

1. Preservation of the Germplasm of Affected Special-Status Plants. This is not an alternative to mitigation by acquisition or restoration, but is a required contingency measure for all significantly affected special-status plants as a contingency in the event of mitigation failure. ~~Mitigation by acquisition or restoration shall also include s~~ Seeds or propagule will shall be collection collected from the affected special-status plants occurrences population onsite prior to construction to conserve the germplasm, and provide a seed source for restoration efforts. 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 ~~p~~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 Restoration Plan approved by the CPM.~~
2. Criteria for Adjusting Mitigation Ratio for New S special-status P plant O occurrences found during 2013 surveys-Torrey’s joint-fir. Due to the uniquely high potential for finding many additional offsite occurrences of Torrey’s joint-fir, gravel milk-vetch, Wheeler’s skeletonweed, and Preuss’ milk-vetch ~~Torrey’s joint-fir occurrences (see explanation in Staff Rebuttal, page 17, tn-69495) Special-status Plant Impacts subsection for explanation),~~ the project owner may conduct pre-construction surveys in 2013 before June 1, 2013, focused on Torrey’s joint-fir. Surveys must be conducted onsite as well as offsite. If the discovery of new occurrences in fall 2012 or spring 2013 results in a downgrading by the California Natural Diversity Database (CNDDDB) of the CNDDB Element Rank by the from an S1 to S2, the species will be mitigated as an S2 species (see subparagraph #1). If the new occurrences result in a downgrading from S1 to S3 (“vulnerable but not under immediate threat of extinction”), AND or the proportion of the statewide distribution affected by the project is less than 10 percent, then mitigation for that species Torrey’s joint-fir shall no longer be required.

[The applicant’s proposal for 2013 surveys accepted and incorporated under subparagraph 2, immediately above] Criteria for Adjusting Mitigation Ratio for Wheeler’s skeletonweed, gravel milkvetch, and Preuss’ milkvetch. Conditions in spring 2012 were

~~unusually dry and rainfall conditions severely and adversely impacted survey efforts to determine if additional Wheeler's skeletonweed, gravel milkvetch, and Preuss' milkvetch special-status plant occurrences exist beyond those located and documented in 2011. The region is botanically under surveyed. In the case of gravel milkvetch, this species was added to the CNPS Inventory following completion of the 2011 surveys. For these reasons, the project owner may elect to conduct surveys focused on Wheeler's skeletonweed, gravel milkvetch, and Preuss' milkvetch. If the discovery of new occurrences results in a downgrading of the CNDDDB Element Rank from an S1 to S2, the species will be mitigated as an S2 species (see subparagraph #1). If the new occurrences result in a downgrading from S1 to S3 ("vulnerable but not under immediate threat of extinction"), or the proportion of the statewide distribution affected by the project is less than 10 percent, then mitigation for these species shall no longer be required.~~

3. In-Lieu Mitigation. Compensatory special-status plant mitigation requirements may be fulfilled at the election of the project owner by using an in-lieu funding option for acquisition or enhancement/restoration of special-status plant occurrences. The in-lieu mitigation approach would be consistent with the provisions included in BIO-25 (In-Lieu Fee and Advanced Mitigation Option) with the exception that the in-lieu option may also be exercised for approved special-status plant restoration/enhancement projects. In-lieu payments for special-status plant mitigation shall only be approved for land trusts in existence for a minimum of three years. Stewardship fees shall be adequate for the long-term management and legal defense of the acquired lands or easement. Any proposals to exercise the in-lieu option would be subject to review and approval by the CPM.

Verification: No fewer than 90 days prior to the start of project ground-disturbing activities, the project owner shall submit to the CPM for review and approval a conceptual proposal for mitigation ~~by one or both of the two methods described in this condition (acquisition and enhancement/restoration)~~ that meets the criteria and performance standards described above, and according to the mitigation ratios described above.

The project owner shall provide the CPM, no less than 30 days prior to the start of any project related ground-disturbing activities, written verification that an approved financial security in accordance with this condition of certification has been established.

No later than June 15 of the first summer following the Final Decision, the project owner shall provide the CPM documentation that seed ~~or other propagules have has~~ been collected for all the affected species and submitted to either Rancho Santa Ana Botanical Garden Seed Conservation Program, San Diego Natural History Museum, or the Missouri Botanical Garden.

No later than 30 days following the discovery of any new occurrences of Torrey's joint-fir, Wheeler's skeletonweed, gravel milkvetch, or Preuss' milkvetch, the project owner shall submit raw GPS data, metadata, and CNDDDB field forms to the CPM. The project owner shall immediately provide written notification to the CPM, ~~CDFG and/or USFWS and BLM~~ if it detects a state- or federal-listed plant species.

No later than 18 months following project approval, the project owner shall submit a draft formal acquisition proposal to the CPM describing the parcels intended for purchase, and a conceptual management and enhancement plan for the acquired lands according to the minimum requirements described under subsection A (Mitigation through Acquisition and Preservation) of this condition.

~~If the project elects to fulfill mitigation obligations through enhancement/restoration, the project owner shall submit a draft final enhancement/restoration plan, according to the minimum requirements described under subsection B (Mitigation through Restoration/Enhancement) for a plan described above, no later than 18 months following project approval.~~

~~The project owner, or an approved third party, shall complete and provide written verification of the completion of the approved acquisition, proposed compensation lands for acquisition and/or the start of an approved enhancement/restoration project, no later than 18 36 months following project approval. the start of project ground disturbing activities. Within 180 days of the land or easement purchase, as determined by the date on the title, the project owner, or an approved third party, shall provide the CPM, with a management plan for the compensation lands and associated funds. The CPM shall review and approve the management plan.~~

~~No fewer than 30 days after acquisition of the property the project owner shall deposit the funds required for long term management, as described above, and provide proof of the deposit to the CPM.~~

~~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 12 36 months after the start of Project ground disturbing activities. If NFWF or another approved third party is being used for the acquisition or enhancement/restoration through the in-lieu mitigation option, the project owner shall ensure that funds needed to accomplish the mitigation acquisition are transferred in timely manner to ensure that completion of acquisition or the start of enhancement/restoration project facilitate the planned acquisition and to ensure the land can be acquired and transferred prior to the 18 36-month deadline.~~

~~No fewer than 30 days after acquisition of the property the project owner shall deposit the funds required for long term management, as described above, and provide proof of the deposit to the CPM.~~

~~If habitat enhancement/restoration is proposed, no later than six 36 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/rRestoration project activities shall be initiated no later than 12 36 months following project the start of construction. The implementation phase of the an approved enhancement/restoration project shall be completed within five years of initiation. Until completion of the five year implementation portion of the enhancement action, a report The annual report describing the progress of the enhancement/restoration shall be prepared according to requirements under subsection B ("Monitoring" and "Reporting Requirements") the 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 forecast for the following year; quantitative measurements of the Project's progress in meeting the enhancement/restoration project success criteria; detailed description of remedial actions taken or proposed; and contact information for the responsible parties.~~

~~In lieu fee payments to compensate for all or a portion of the project's impacts to special status plants shall be subject to the notice and other provisions of BIO-25.~~

BIO-21: BOTANIST QUALIFICATIONS AND DUTIES

~~The Applicant requests that Condition BIO-21 be revised to reflect that with specialized training, the Designated Biologist may implement the duties of the Designated Botanist. General impact avoidance and minimization measures included in the verification paragraph of this measure have been deleted because these are already described in BIO-8 and BIO-19 and they are redundant.~~

BIO-21 The project owner's approved Designated Biologist shall oversee the selection and hiring of qualified botanist(s) to implement ~~the specific tasks specified below; a full-time Designated Botanist position is not required. tasks in BIO-18 (Weed Management Plan), BIO-19 (Special-status Plant Avoidance and Minimization Measures), BIO-20 (Special-status Plant Compensatory Mitigation), and BIO-23 (Groundwater dependent Vegetation Monitoring) specified below that must be accomplished by a qualified botanist. All other tasks described in these measures not contained in the list below may be accomplished by the Designated Biologist.~~ The Designated Biologist shall submit to the CPM for approval the resume, at least three references, and contact information for the qualified botanist(s) to fulfill the tasks below. The resume(s) shall demonstrate, to the satisfaction of the CPM the appropriate education and experience to accomplish the assigned botanical resource tasks. ~~The tasks listed below may be performed by the~~ **If the Designated Biologist** if he/she meets the minimum qualifications described below. ~~possesses these qualifications, the Designated Biologist may perform these duties and a sepa.~~

Botanist(s) must meet the following minimum qualifications:

- 1) Demonstrated knowledge of: a) general plant taxonomy and natural community ecology; b) familiarity with the plants of the area, including special status species; and c) familiarity with natural communities of the project area;
- 2) At least five years experience conducting floristic field surveys;
- 3) At least five years experience working in the California Desert region;
- 4) Familiarity with the appropriate state and federal statutes related to plants and protocols or guidelines for conducting botanical inventories; and
- 5) At least five years experience analyzing the impacts of development on native plant species and natural communities.

Tasks requiring a qualified botanist shall include the following:

- 1) Advise the project owner's construction and operation managers, and the Designated Biologist on the implementation of botanical resource conditions of certification;
- 2) Conduct and/or train, supervise and coordinate botanical resources compliance efforts ~~in close proximity to special status plant occurrences~~ as described in **BIO-18** (Weed Management Plan) and **BIO-19** (Special-status Plant Avoidance and Minimization Measures);
- 3) **Conduct and/or train, supervise, and coordinate marking** ~~Mark any~~ **offsite** special-status plant ~~Environmentally Sensitive Areas (ESAs) occurrences~~ **that occur within 100**

feet of the project boundary and inspect ~~these~~ the integrity of the ESA signage areas at appropriate intervals for compliance with conditions of certification affecting or relating to special-status plants as described in **BIO-19**;

- 4) Prepare the Weed Management Plan as described in **BIO-18** and conduct and/or train, supervise, and coordinate the surveying and annual monitoring required in the plan;
- 5) Consult and/or prepare the Special-status Plant Compensatory Mitigation plans for enhancement/restoration and/or proposals for acquiring compensation lands, and conduct and/or train, supervise, and coordinate annual monitoring required in the plans; and Conduct and/or train and supervise the Designated Biologist in the implementation of **BIO-23** (Groundwater-dependent Vegetation Monitoring).

Verification: At least 60 days prior to construction-related ground disturbance, the project owner shall submit the resume to the CPM for a botanist to conduct the tasks described above. ~~under tasks #1 and #2.~~ Once approved, the project owner shall provide written verification to the CPM that the qualified botanist is available to implement the required mitigation measures during construction. No construction related ground disturbance, site mobilization, grading, boring, trenching, chemical spraying, or weed management within 100 feet of a special status plant occurrence shall commence until an approved botanist has surveyed and marked the special status plant occurrences adjacent to the project as Environmentally Sensitive Areas as described in BIO-19 (Special status Plant Avoidance and Minimization Measures).

BIO-22: STATE WATERS COMPENSATORY MITIGATION AND IMPACT AVOIDANCE & MINIMIZATION MEASURES

~~Proposed revisions to Condition BIO-22 are discussed in the following paragraphs and incorporated into the Condition text in either underlined new text or and strikethrough formats. Below is an explanation of the proposed revisions. A complete redline/strikeout of the condition follows.~~

~~Page 4.2-271 Section 1600 Notification Form and Fees. Applicant has already submitted to CDFG the 1600 Notification and Fees together with updated information and maps of state waters; therefore, Item 1 of the condition should be deleted.~~

~~Page 4.2-271 Compensatory Mitigation. For item 2, first sentence, consistent with the mitigation ratio discussion above for other large scale solar projects, the mitigation ratio has been revised to reflect the 1:1 mitigation ratio required for impacts to similar ephemeral washes in other CEC approved projects.~~

~~Page 4.2-272 b. Integrating Special Status Plant Mitigation with Other Mitigation Lands. A type correction has been made to the condition language.~~

~~Page 4.2-273 Avoidance and Minimization Measures. For subsection 3.c, "Documentation at the Site and Project Entry," the CPM on behalf of the Commission has the right to issue a stop work order if non-compliance with a Condition occurs. There is no need to re-state this authority in the Condition. The CPM cannot stop work "for other reasons" unrelated to compliance. Moreover, the CPM acting for the Commission has sole authority over State law matters and cannot "allow CDFG" or any other~~

~~entity to issue a stop work order. The simplest fix would be to delete the third sentence and all that follows in its entirety (as noted below if Applicant's edits to the full condition). Otherwise, the language should be revised as follows:~~

~~***“The CPM reserves the right to issue a stop work order or allow CDFG to issue a stop work order after giving notice to the project owner and the CPM, if the CPM in consultation with CDFG, determines that the project owner has breached any of the terms or conditions or for other reasons, including but not limited to the following:~~

~~i) The information provided by the project regarding impacts to waters of the state is incomplete or inaccurate in some materials manner;~~

~~ii) New materials information becomes available that was not known in preparing the terms and conditions; or~~

~~iii) The project or project activities as described in the Staff Assessment the Commission’s Final Decision have changed.~~

~~Page 4.2-273 b) Diffuser Design. Replace “volume” with “rate” because retention area is designed to maintain peak flow rates.~~

~~Page 4.2-274 d) Best Management Practices. Revise language to be consistent with the requirements of the Construction General Permit.~~

~~Page 4.2-274 Delete section d)iii) in its entirety because the CGP contains requirements for construction activities based on storm probabilities, which differ from condition iii). Compliance with the CGP should constitute compliance with CWA, and more prescriptive requirements from the Commission are unwarranted.~~

~~Page 4.2-275 e) Changes of Conditions. Changes are recommended to make it clear that physical changes that are common with streams on alluvial fan systems, and changes that are part of the project description (e.g., vegetation removal or trimming) do not qualify as physical changes that require formal notification.~~

~~Page 4.2-276 Revisions to Verification are recommended to conform to other recommended changes to BIO-22.~~

BIO-22 To satisfy requirements of California Fish and Game Code sections 1600 and 1607, the project owner shall implement measures contained herein for: 1) compensating unavoidable impacts to all ~~w~~Waters of the ~~s~~State located within the project footprint, and 2) for avoiding and minimizing accidental, incidental and indirect impacts to state waters located outside the project footprint. For purposes of this condition, “project footprint” means all lands contained within the boundaries of the project components, including access roads, utility and transmission alignments, staging areas, and temporary construction areas. Avoidance and minimization measures for work within or adjacent to waters shall be implemented during construction, operation, and decommissioning, including site mobilization.

~~1. Complete and Submit Section 1600 Notification Form and Fees. Coordinate with CDFG to submit a formal 1600 application and associated fees. Submit a final revised state~~

waters delineation report to include additional features identified during the field verification of the state waters delineation.

2. Compensatory Mitigation. The project owner shall acquire and preserve under a permanent conservation easement a parcel or parcels of land that contain jurisdictional state waters in an amount equal to the area of state waters delineated within the project footprint and mitigated at a ratio of ~~2~~1:1 (~~two-one~~ acres for every acre of state waters onsite) for permanent impacts to habitat functions and values. This ratio assumes that impacts to the hydrologic and geomorphic functions will be minimized by not diverting streams around the site in artificial channels. If the channels are diverted around the site, the mitigation ratio shall increase to a ratio of 3:1. The project owner shall provide associated funding for the long-term stewardship of the acquired lands, as specified below.
 - a. Selection Criteria. Compensation lands for impacts to state waters shall meet the following criteria:
 - i. Located in California and within the Pahrump Valley Hydrologic Unit. If the project owner demonstrates that suitable compensation lands are not available within Pahrump Valley, lands may be acquired in California Valley, or the California portions of Sandy (Mesquite) Valley and Stewart Valley or other adjacent watersheds.
 - ii. Contain waters in a general physiographic setting similar to the affected waters (i.e., alluvial fan washes) or that provide similar habitat function and values. Proposed mitigation sites shall be described in terms of habitat function and values, in the context of the habitat function and values that were impacted at the project site, in a proposal subject to approval by the CPM in consultation with CDFG;
 - iii. Contain waters of a similar or better quality than the affected waters. Subject to review and approval of the CPM in consultation with CDFG, lands degraded by unauthorized off-road vehicles (ORV) may be considered if the project owner can demonstrate that the unauthorized ORV can be excluded and controlled with road decommissioning and signage;
 - iv. Contain waters that are hydrologically unimpaired upstream by dams or diversions. Subject to review and approval of the CPM in consultation with CDFG, impaired waters may be considered if it can be demonstrated that the hydrologic functions can be restored and are accompanied by a restoration proposal;
 - v. Do not contain hazardous wastes that cannot be removed; and
 - vi. Contain water and mineral rights as part of the acquisition, unless the CPM, in consultation with CDFG, agrees in writing to the acceptability of the land.
 - b. Integrating Special-Status Plant Mitigation with Other Mitigation Lands. Any portion of the acquired Desert Tortoise or other required compensation lands that meets

the criteria above for state waters may be used to fulfill that portion of the obligation for state waters mitigation.

- c. Security for Implementation of Mitigation: The project owner shall provide financial assurances to the CPM to guarantee that an adequate level of funding is available to implement the acquisitions and enhancement of state waters as 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 security prior to initiating ground-disturbing project activities. Prior to submittal to the CPM, the mitigation security shall be approved by the CPM, in consultation with CDFG. The final amount due shall be determined by updated appraisals and the PAR analysis conducted pursuant to **BIO-12** (Desert Tortoise Compensatory Mitigation).
 - d. Prepare Management Plan for Stewardship of Acquired Lands: The project owner shall submit a draft State Waters Mitigation Management Plan subject to review and approval by the CPM in consultation with CDFG. The goal of the plan is to protect the integrity of the washes and their habitat functions and values from unauthorized ORV and other threats, or to restore degraded functions and values as described in #2 (a) above. Acquired lands must be protected in perpetuity under a conservation easement as described in **BIO-12** (Desert Tortoise Compensatory Mitigation).
 - e. Compensation Lands Acquisition Requirements. The project owner shall comply with the requirements relating to acquisition of the compensation lands described in **BIO-12** (Desert Tortoise Compensatory Mitigation).
- 3) Avoidance and Minimization Measures. The measures described below shall be implemented during construction, operation, and closure for any project-related activity that may directly or indirectly affect offsite waters adjacent to the project boundary, and to minimize impacts to the hydrologic and geomorphic functions of waters onsite, including water quality. Such activities include ground or vegetation disturbing activities, weed and vegetation management activities, and pre-construction mobilization. The project owner shall provide a discussion of work in or adjacent to ~~w~~Waters of the ~~s~~Sstate, and the avoidance and minimization measures employed to protect offsite waters from accidental or indirect effects in the Annual Compliance Reports.
- a) Guidelines for Stream Crossings. The project owner shall minimize disturbance to surface drainage patterns and sediment transport in watercourses downstream of the project. Arizona crossings shall be employed for improvements to project access roads wherever such crossings do not present a safety hazard and where the roadbed elevation allows the construction of such crossings. Crossings shall be constructed to accommodate the full natural width of the channel (bank-to-bank) for single-thread channels, and the full width of the floodplain for braided distributary channels. Streams that have been graded for temporary construction access shall be restored to original contours and surface drainage patterns and shall be stabilized according to specifications in **SOIL-1**.

- b) Diffuser Design. For any diverted watercourse, the project owner shall maintain pre-development surface drainage patterns downstream of the project, in location and approximate ~~volume~~ rate of flows. Flows shall not be discharged indiscriminately as sheet flow across the entire length of the diffusers, irrespective of the natural surface drainage patterns, but shall instead be designed to discharge within existing watercourse boundaries downstream, or within the active floodplain of braided distributary stream types.
- c) Documentation at the Site and Project Entry. The project owner shall provide a copy of this condition from the Energy Commission Final Decision to all contractors, subcontractors, and the owner's project supervisors and Designated Biologist. Copies shall be readily available at work sites at all times during periods of active work and must be presented to any Energy Commission (CEC), CDFG personnel upon demand. ~~The CPM reserves the right to issue a stop work order or allow CDFG to issue a stop work order after giving notice to the project owner and the CPM, if the CPM in consultation with CDFG, determines that the project owner has breached any of the terms or conditions or for other reasons, including but not limited to the following:~~
- ~~i) The information provided by the project regarding impacts to waters of the state is incomplete or inaccurate;~~
 - ~~ii) New information becomes available that was not known in preparing the terms and conditions; or~~
 - ~~iii) The project or project activities as described in the Staff Assessment have changed.~~
- d) Best Management Practices (BMPs). ~~A site-specific SWPPP will be implemented in accordance with requirements of the Construction General Permit (CGP). The SWPPP will identify appropriate BMPs, as well as monitoring, sampling and inspections consistent with the project's calculated risk level.~~ During construction, operation, closure, and pre-construction mobilization, the following BMPs shall be implemented to avoid accidental impact during construction or indirect effects to state waters:
- i) During the pre-construction planning stage identify gravel storage areas, staging areas, access roads, parking, turnarounds, and equipment refueling & maintenance areas to minimize impacts to any delineated state waters outside of the permitted work area. Staging, storage, equipment maintenance and re-fueling shall be located a minimum of 30 feet from the uphill side of streams and their active floodplain to protect water quality downstream. The boundaries of those work areas shall be clearly marked on all final site plan and construction drawings.
 - ii) Prior to the start of construction, establish the stream zones offsite or outside the permitted work area that are adjacent to work activities as Environmentally Sensitive Areas (ESAs). No earth-moving activities, vegetation removal, vehicles, heavy equipment, material storage, equipment maintenance or re-fueling, or

other construction activities shall be permitted within the ESAs. Work shall not begin until the boundaries of the ESAs are delineated on the ground with orange safety netting where they occur adjacent to work activities (e.g., along the project boundary) under supervision of the Biological Monitor. The ESAs shall be depicted on all final maps and specifications.

- iii) **Construction activities shall be timed with awareness of precipitation forecasts, and shall be started only if the local weather forecast predicts no probability of rain for a period of 72 24 hours. Construction activities shall cease and water quality, erosion and sediment control measures shall be implemented prior to storm events to prevent erosion and sedimentation, and contamination of stormwater runoff. Activities outside of the sensitive areas described above are not confined to this time period, but at no time shall heavy equipment operate during wet weather. Extra sediment, pollutant, and erosion control materials shall be stockpiled onsite to address any unanticipated rain events.**
- iv) The project owner shall minimize road building, construction activities and vegetation clearing on streams within the site wherever possible by limiting the width of the work area. Access to the site shall be on existing access roads.
- v) In the event of wet weather, the project owner shall not allow water containing mud, silt, or other pollutants from grading, aggregate washing, or other activities to enter streams outside the permitted work area, or be placed in locations that may be subjected to storm runoff. Prior to the start of work, including any equipment move-on or materials storage, install silt-fencing, straw bales, sediment catch basins, straw or coir logs or rolls, or other sediment barriers to keep erodible soils and other pollutants from entering state waters outside the permitted work area. ~~Extra sediment, pollutant, and erosion control materials shall be stockpiled onsite to address any unanticipated rain events, problems and emergencies.~~ *[moved to subparagraph iii), above]*
- vi) No broken concrete, debris, soil, silt, sand, gravel, rubbish, cement or concrete wash water, oil or petroleum products, or other contaminants shall be allowed to enter into, or placed where it may be washed by rainfall or runoff into waters of the state outside the permitted work area. The contractor shall immediately contain and clean up any petroleum or other chemical spills with absorbent materials such as sawdust or cat litter. For other hazardous materials, follow cleanup instructions on the package.
- e) **Changes of Conditions.** A formal notification shall be provided to the CPM and CDFG if a change of conditions is identified. As used here, change of condition refers to the process, procedures, and methods of operation of a project; the biological and physical characteristics of a project area; or the laws or regulations pertinent to the project as defined below. A copy of the change of conditions notification shall be included in the annual reports or until it is deemed unnecessary by the CPM, in consultation with CDFG. A change in biological conditions includes, but is not limited to, the following: the presence of biological resources within or adjacent to

the project area, whether native or non-native, not previously known to occur in the area; or the presence of biological resources within or adjacent to the project area, whether native or non-native, the status of which has changed to endangered, rare, or threatened, as defined in section 15380 of Title 14 of the California Code of Regulations. A change in physical conditions includes unexpected, substantial physical changes that result from project implementation, and do not include the types of changes that are typical of alluvial fan stream systems; such changes include, but is are not limited to, the following: an adverse, substantial change in the morphology of a river, stream, channel or lake, such as the lowering of a bed or scouring of a bank, or substantial changes in stream form and configuration caused by storm events; the substantial movement of a river or stream channel to a different location; a substantial reduction of or other change in vegetation on the bed, channel, or bank of a drainage that is outside of approved vegetation management; or substantial changes to the hydrologic regime such as fluctuations in the timing or volume of water flows in a river or stream.

- f) Legal Conditions: a change in legal conditions includes, but is not limited to, a change in Regulations, Statutory Law, a Judicial or Court decision, or the listing of a species, the status of which has changed to endangered, rare, or threatened, as defined in section 15380 of Title 14 of the California Code of Regulations.

Verification: No less than 60 days prior to beginning project ground-disturbing activities, the project owner shall provide to the CPM design drawings of drainage diffusers or other discharge points depicting how these structures restore pre-development drainage patterns (location and volume rate of flows) to any watercourses located downstream of the project boundaries. At the same time the project owner shall provide design drawings for temporary and permanent stream crossings.

No less than 30 days prior to the start of construction-related ground disturbance activities, the project owner shall provide written verification (i.e., through incorporation into the BRMIMP) to the CPM that the above BMPs will be implemented. No later than 60 days prior to beginning ground-disturbing activities, a formal 1600 application and fees shall be submitted to CDFG, and the project owner shall provide the CPM a copy of the 1600 application and verification of payment of CDFG 1600 fees. A copy of the final state waters delineation shall be incorporated into the BMIMP.

The project owner shall provide the CPM, no less than 30 days prior to the start of any project related ground-disturbing activities, written verification that an approved security for compensatory mitigation in accordance with this condition of certification has been established. The financial security shall be in place will be used to purchase compensatory habitat for impacts to state waters and must be accomplished no later than 18 24 months following project approval. from after the start of any on-site project-related construction activities

Acquisition shall be completed within 36 months following project approval and—As evidenced by aA copy of the final recorded deed showing transfer of mitigation land or documentation of other approved mitigation transaction as approved by the CPM.

No less than 90 days prior to the acquisition of the compensation lands, the project owner shall submit a formal-draft acquisition proposal, including Property Analysis Record (PAR), to the CPM and CDFG. AThe draft management plan for the acquired lands State Waters Mitigation Management Plan shall be submitted to the CDFG and CPM no less than 60 days after acquisition of the compensation lands.

BIO-23: GROUNDWATER-DEPENDENT VEGETATION MONITORING PLAN^{12,13}

BIO-23 The project owner shall prepare and implement a draft and final Groundwater-dependent Vegetation Monitoring Plan (~~GDVMP~~Vegetation Monitoring Plan) according to the performance standards described below. The GDVMP, in conjunction with the Groundwater Monitoring, Mitigation, and Reporting Plan (**WATER SUPPLY-4**), is designed to avoid potential impacts to will protect groundwater-dependent ecosystems (GDEs) located near the project ~~influence of the project pumping wells~~ from ~~the impacts of~~ project-related groundwater drawdown. The GDVMP shall employ a “Before-After, Control-Impact” (BACI) study design (baseline data and controls) to ensure the project is not responsible for effects that fall within normal inter- and intra-annual variability in of plant moisture stress, or the influence of climate factors or area pumping wells. The GDVMP requires the use of standardized, objective, sensitive, and quantitative field measurements that: 1) are routinely made by plant physiological ecologists and agriculturists to determine plant moisture stress, and 2) protect the nearby GDEs by providing early warning signs of impending adverse effects. ~~the use of~~ ~~The plans require monitoring in the GDEs to track the impacts of pumping to groundwater levels as they develop during the life of the project, and define~~ **WATER SUPPLY-4** defines triggers for adaptive management to be implemented if groundwater level data indicate an impending drawdown at the nearby GDEs.~~adverse effects.~~ The GDVMP also defines minimum standards for evidence that would be considered for adjusting the project-related drawdown trigger at the project boundary in 0.5 ft increments if data demonstrate no adverse effects to the GDEs. The CPM shall consult the BLM Nevada and BLM California State Lead for Soil, Water, Air and Riparian Programs, the BLM Southern Nevada District and Barstow District Hydrologist and Botanist, and Inyo County Water Department in the review of the draft GDVMP and annual monitoring reports. ~~The project owner shall submit a draft GDVMP~~Vegetation Monitoring Plan to the CPM for review and approval by the CPM, in consultation with the BLM Nevada and BLM California State Lead for Soil, Water, Air and Riparian Programs, the BLM Southern Nevada District and Barstow District Hydrologist and Botanist, and Inyo County Water Department. ~~The GDVMP~~ Vegetation Monitoring Plan and shall meet the performance standards, monitoring objectives, monitoring methods, and guidelines for content of the plan specified in this condition.

~~If water level monitoring, as described in WATER SUPPLY-4, identifies a projected 0.5 foot or greater water level decline at the property boundary due to project pumping, the project owner shall cease pumping, and reduce or modify pumping to restore water levels to pre-threshold levels unless evidence, subject to review and approval by the CPM, in consultation with the parties listed above, demonstrates the drawdown trigger was exceeded due to factors~~

¹² The applicant proposed major revisions to BIO-23 but did not provide a strike-out version in their testimony (see citation below). Staff rejected all but the few edits shown in blue font. The edits shown in red underlined and red strike-through font represent staff's own proposed edits and are intended to provide: 1) clarifications of concerns expressed by the applicant or others in workshops or testimony; 2) consistency with staff's revised **WATER SUPPLY-4**, or 3) eliminate any redundancy.

¹³ (CH2M Hill 2013 - Applicant's Opening Testimony, Exhibit 71, pp. 97-128. Docketed January 22, 2103 (tn:99215). Online: http://www.energy.ca.gov/sitingcases/hiddenhills/documents/applicant/2013-01-22_Applicants_Opening_Testimony_Exhibit_71_TN-69215.pdf

~~other than the project pumping and the project did not contribute to the drawdown. Alternatively, the project may provide evidence through vegetation monitoring and soil coring described in this condition, and through updated predictive hydrologic trend analysis described in WATER SUPPLY 4, that a greater drawdown will meet all performance standards contained in this condition for avoiding significant adverse impacts to groundwater dependent vegetation.~~

1. Trigger for Adaptive Management. If water levels in either of the Power Block 1 or Power Block 2 Onsite Monitoring Wells identify a projected 0.5 foot or greater water level decline at the property boundary due to project pumping during construction or operation, as described in **WATER SUPPLY-4**, the project owner shall stop project pumping until the project owner provides evidence, subject to approval by the CPM, that demonstrates:

a) the pumping can be reduced or modified to maintain groundwater levels above the 0.5 ft drawdown trigger at the project boundary; or

b) the drawdown trigger was exceeded due to factors other than the project pumping and the project did not contribute to the drawdown; or

c) through vegetation monitoring and soil coring described in this condition, and predictive water level trend analysis described in **WATER SUPPLY-4, subsection C.2**, that a greater groundwater drawdown will not result in significant adverse impacts to the groundwater dependent vegetation.

2. Peer Review. The draft Vegetation Monitoring Plan shall undergo a peer review by three or more recognized experts in ~~the development of~~ sampling and monitoring ~~plans for~~ plant populations; responses of desert phreatophytes (groundwater-dependent plants) to drought stress or ~~a declining~~ groundwater table ~~depletion~~; and biostatistics. The peer reviewers shall be selected and organized by the CPM, in consultation with the BLM and Inyo County parties listed above. ~~Nevada and BLM California state leads for Soil, Water, Air and Riparian Programs, and the BLM Southern Nevada District and BLM Barstow District Hydrologist and Botanist, and Inyo County Water Department.~~ The cost of the peer review shall be paid by the project owner. The peer review panel described above is required only for the review of the draft GDVMP Vegetation Monitoring Plan; all other approvals shall be made by the CPM, in consultation with BLM and Inyo County as described in this condition.

3. Monitoring Objectives and Performance Standards. The goal of the monitoring is to avoid impacts to the mesquite habitats and other nearby GDEs from project groundwater pumping before it results in any plant mortality or any drawdown-related stress from which the GDEs cannot recover fully within one season following detection. The objectives of the GDVMP Vegetation Monitoring Plan shall be to monitor the project effects of groundwater pumping on GDEs at a level of detail necessary for: a) avoiding significant adverse effects to the GDEs; and b) distinguishing project effects from the effects of background trends or normal inter- and intra-annual variability in plant

~~moisture stress indicators, seasonal variation; and c) distinguishing project effects from natural variability between populations or monitoring plots.~~

Distinguishing project water level effects from background effects or the effects of nearby wells shall be accomplished through the monitoring plan described in **WATER SUPPLY-4**.

4. Definitions. "Sampling", as used in this condition, is the process of selecting a part of something with the intent of showing the quality or nature of the whole. "Baseline monitoring" is the assessment of existing (pre-pumping) conditions to provide a standard, or baseline against which future change is measured. "Normal seasonal variation" ~~in plant moisture stress indicators~~vegetation attributes, shall be established by collecting baseline measurements that encompass the range of inter and intra-annual variation. collected attributes between the peak growing season and the hottest and driest time of year. "Variability within the population" shall be established by measuring differences in the ~~stress indicators~~vegetation attributes between plots. "GDEs" shall include any plant communities dominated by obligate or facultative "phreatophytes" (groundwater-dependent plants). GDEs also include aquatic habitats that are groundwater-supported, such as seeps and springs. A "significant adverse effect to the GDEs" shall be defined as the level of ~~plant moisture drought~~ stress from which a groundwater-dependent species or habitat cannot fully recover in one season following detection.
5. Minimum Standards for Revising Drawdown Trigger. ~~As described in **WATER SUPPLY-4** subsection C.5, and in this condition under "Trigger for Adaptive Management",~~ The water level-based trigger for adaptive action, described in **WATER SUPPLY-4**, may be revised in 0.5-foot increments if the project owner can demonstrate that a groundwater drawdown greater than 0.5 feet will not result in significant adverse impacts to the groundwater-dependent vegetation. Modification of the drawdown trigger requires consideration of the following evidence: a) observed water level changes in monitoring wells; b) quantitative field measures of groundwater-dependent vegetation response to lowering water tables as described in this condition; ~~c) observations of rooting depths from soil cores, as described in this condition;~~ d) updated predictive hydrologic trend analyses from well data collected during project operation, as described in **WATER SUPPLY-4**; and d) the range of normal inter- and intra-annual variation, and background trends in plant moisture stress indicators as described under "Field Techniques". ~~and e) hydrogeologic variability between populations or monitoring plots.; and e). Soil cores, as described in this condition, may be used in conjunction with the vegetation monitoring to demonstrate maximum effective rooting depths.~~ BLM and Inyo County shall be consulted regarding the resetting of the adaptive action trigger.

Alternately, the pumping can be reduced or modified to maintain groundwater levels above the 0.5 ft. drawdown trigger described in **WATER SUPPLY-4** at the

project boundary. Using methods described in **WATER SUPPLY-4** for statistical trend analysis of monitoring well data, the project must provide evidence, subject to approval by the CPM in consultation with BLM and Inyo County, that the maximum pumping rate will not exceed the maximum drawdown indicated by the data for the life of the project.

6. Prepare an Updated Inventory and Map of Groundwater-dependent Species and Ecosystems (GDEs). The map of GDEs prepared for this project (CH2 2011c, Data Response Set 1A, Figure D48-1), shall be amended to include seeps and springs identified by BLM or through ground surveys and any plant community dominated by obligate or facultative phreatophytes **within the predicted cone of depression**. The map shall be accompanied by a list of all obligate and facultative phreatophytes contained in each GDE. Phreatophytes observed in the project botanical resource study area include (but are not limited to): honey mesquite (*Prosopis glandulosa*); four-wing saltbush (*Atriplex canescens*); allscale (*A. polycarpa*); spiny saltbush (*A. spinifera* ~~*escens*~~); bush seep-weed (*Suaeda moquinii*); desert baccharis (*Baccharis sergiloides*); alkali goldenbush (*Isocoma acradenia*); the non-native salt cedar (*Tamarix* spp.).
 7. Permanent Monitoring Plots. The vegetation monitoring shall be conducted within GDEs located: a) east of the project and nearest to the project boundary, as depicted in HHSEGS Data Response Set 1A, Figure D48-1 (CH2 2011c); **and b) beyond the project's influence ("controls"). within the BLM Stump Spring ACEC between the ACEC and the project pumping wells.** No GDEs occur within the project boundary and monitoring plots shall not be located in upland plant communities that are not groundwater-dependent.
 8. Baseline and Long-term Data Collection. Baseline data may be ~~shall be~~ collected at all vegetation monitoring sites beginning as soon as feasible upon project approval to determine **normal seasonal variation in vegetation attributes and background trends and facilitate the determination of background trends (decline) in plant moisture stress indicators** from other sources, including climate conditions. At a minimum, baseline data collection shall begin immediately upon approval of the final GDVMP. Baseline data may continue after the start of project pumping as long as no project-related drawdown is detected (see WATER SUPPLY-4), or collected from the reference plots located just beyond the project's actual cone of depression. ~~Data on existing or baseline conditions shall be updated each year until a drawdown is detected at the project boundary to establish any background trends. Any future change detected shall be adjusted for normal seasonal variation and background trends from other sources. is compared against the baseline, and adjusted for any background decline, such as a regional drop in water levels or vegetation decline from climate conditions established in the baseline trend.~~ Data collection shall continue for the life of the project unless the CPM determines, in consultation with BLM **and Inyo County, Nevada and BLM California state leads for Soil, Water, Air and Riparian Programs, BLM Southern Nevada District and BLM Barstow District Hydrologist and Botanist, and Inyo County Water Department,** that
-

if no project-related drawdown is detected at the project boundary and not expected based on refined hydrologic trend analysis, or pumping ceases and groundwater levels have returned to baseline levels, the project may stop or reduce its monitoring obligation.

9. Timing. Vegetation monitoring shall be conducted twice annually during the same two week time period during the peak growing period and during the hottest and driest time of year locally. Intra-annual variability shall be established from measurements made during the same 2-week window during the summer dry season. Timing of well monitoring shall be conducted as described in **WATER SUPPLY-4**.

10. Monitoring Controls. The GDVMP shall employ a BACI study design using reference monitoring sites located just outside of the project's zone of influence to compare differences between the control and impact sites (near-project plots within the project's influence) before the project begins and after the project begins. This controls both for natural variability between plots, temporal variability associated with annual weather differences, and any regional background decline in water levels. If the differences through the years remain the same then it is assumed the project has not affected the GDEs. The control sites would be paired in space, not in time; each monitoring site in the impact area shall be paired with a site in the control area. The control and impact sites shall a) have an equal number of monitoring plots, and b) paired based on vegetation and other environmental factors being similar. Control and treatment sites shall be positioned relative to the monitoring wells. Additionally, data from the control and treatment sites shall be averaged and the difference over time compared (see description of repeated measures analysis of variance in Chapter 6, "Impact Assessment" of *Statistics for Environmental Science and Management* (Manly 2008)¹⁴.

11. Field Techniques for Measuring Plant Moisture Stress. Vegetation Response to Drought Stress. Vegetation monitoring shall employ only sensitive, reliable, and objective field measures of moisture stress~~drought stress~~ that can detect the earliest warning signs of an adverse effect. These include: 1) xylem (stem) water potential; 2) gas exchange rate, and 3) transpiration rate. ~~Ecophysiological thresholds shall be established only after field calibrating the measurements to establish normal seasonal variation, and variability between plots or populations. Field techniques that rely on visual estimates, die-back, or photo monitoring shall not be used.~~ Photo monitoring may be used to supplement – not replace – the quantitative measures described above. The GDVMP~~Vegetation Monitoring Plan~~ must demonstrate knowledge of the biology of the GDE species and their physiological and morphological responses to stress. ~~shall not be considered~~

¹⁴ Manly 2008 – Manly, B., *Statistics for Environmental Science and Management* (2nd ed), CRC Press/Chapman and Hall, 292 pp.

~~an acceptable monitoring method but may be useful to aid in the presentation of monitoring results. Field techniques that rely on visual estimates shall not be used.~~ The draft Plan shall describe how the data will be recorded in the field, processed and stored.

12. Minimum Standards for Sampling Design. The sample size and sampling design shall be sufficient to achieve adequate statistical power of 90 percent or better, with a Type I error rate (false-change error rate) of 10 percent or less. ~~The minimum detectable change, or biologically significant change in vegetative measurements of drought stress, shall be established by conducting measurements in the field as described under "Field techniques" in this condition, and calibrated or adjusted for normal seasonal variation and variability between plots.~~

Following collection of the first year baseline data, statistical analysis shall be conducted to refine the power analysis and evaluate the adequacy of the sampling design. If the analysis of baseline data (at the near-project plots and reference plots) indicates that the sampling design is insufficient to achieve adequate statistical power, the design shall be modified (for example, by adding additional monitoring sites or reducing the deviation among sampling units) to attain the desired level of precision. The sampling design shall be informed by *Statistics for Environmental Science and Management (Manly 2008), Chapter 6 "Impact Assessment"*, and from *Measuring and Monitoring Plant Populations* (Elzinga et al. 1998)¹⁵ and *Sampling Vegetation Attributes* (Coulloudon et al. 1999)¹⁶. ~~The draft Vegetation Monitoring Plan shall also describe how groundwater elevation monitoring data collected pursuant to **WATER SUPPLY 4** would be used to interpret the vegetation data.~~

13. Soil Core Sampling. Subject to approval by BLM and any other local, state, or federal permit requirements, soil core samples may be collected from the GDEs on BLM lands offsite to establish the maximum effective rooting depth of the mesquite and other co-dominant phreatophytes. The coring method must provide a continuous core that will provide visual examination of roots and root nodules, soil profile, and soil moisture.

14. Parties Responsible for Monitoring. All data collection shall be conducted or supervised by a qualified botanist (**BIO-21**). The Designated Biologist may conduct monitoring under the training and supervision of a qualified botanist. Monitoring data shall be quality-checked annually by the CPM, in consultation with BLM ~~and Inyo County, Nevada and BLM California, and the Inyo County Water Department.~~

15. Access to Monitoring Data. Copies of monitoring reports and data

¹⁵ Elzinga et al 1998 – Elzinga, C.L., D.W. Salzer, and J.W. Willoughby. 1998. *Measuring and monitoring plant populations*. BLM Technical Reference 1730-1, Denver, CO. 477 pp.

¹⁶ Coulloudon 1999– Coulloudon, B., *Sampling Vegetation Attributes*. BLM Technical Reference 1734-4. National Business Center, Denver, CO. 158 pp.

shall be available to the CPM and BLM at all times. The CPM reserves the right to issue ~~an order to stop, reduce, or modify pumping-stop pumping order~~ after giving notice to the project owner if the CPM determines the monitoring data provided is incomplete or inaccurate.

16. Semi-Annual Monitoring Report. Monitoring Reports shall be submitted to the CPM, BLM, ~~and Inyo County Nevada and BLM California state leads for Soil, Water, Air and Riparian Programs, the BLM Southern Nevada District and BLM Barstow District Hydrologist and Botanist, and Inyo County Water Department~~ twice annually and shall include: names and contact information for the responsible parties and monitoring personnel; description of sampling and monitoring techniques used for each attribute; quantitative results of the vegetation and groundwater level monitoring; comparison of predicted versus actual water table declines; trends and other analyses based on the statistical tests and methods described in this condition and in **WATER SUPPLY-4**; ~~the final Vegetation Monitoring Plan~~; photos of the monitoring plots and controls; conclusions and recommendations. The first and second annual monitoring reports shall also include an appropriate statistical analysis of baseline monitoring data to assess whether the sampling design was adequate to attain sampling precision as described above, and how the study design was adjusted to ensure performance standards were met.

Verification: No less than 90 days prior to start of any project-related groundwater pumping, the project owner shall provide a draft GDVMP Groundwater-dependent Vegetation Monitoring Plan to the CPM for peer review, as described in this condition.

The CPM shall organize the peer review and comments shall be received no later than 45 days from receipt of the draft GDVMP. The CPM shall also consult BLM Nevada and BLM California state leads for Soil, Water, Air and Riparian Programs, and the BLM Southern Nevada District and BLM Barstow District Hydrologist and Botanist, and Inyo County Water Department. If comments are not received from the interested parties within 45 days, the CPM shall proceed and submit comments to the project owner within 60 days of receipt of the draft GDVMP.

The project owner shall revise the draft based on the recommendations of the peer review within 45 days, and submit the final GDVMP to the CPM for review and approval. The CPM shall submit the final GDVMP to the interested parties listed above.

The CPM shall submit the annual monitoring reports to the interested parties and comments must be received within 45 days of receipt of the monitoring reports.

Collection of baseline monitoring data shall begin immediately following the acceptance of the final GDVMP. The project owner may elect to begin baseline vegetation monitoring at any time following the Final Decision. ~~the first spring or fall following the Final Decision.~~

The GDVMP Vegetation Monitoring Plan annual monitoring reports shall be provided to the CPM, BLM Nevada and BLM California state leads for Soil, Water, Air and Riparian Programs, and the BLM Southern Nevada District and BLM Barstow District Hydrologist and Botanist, and Inyo County Water Department

no more than 90 days following the collection of the summer dry season data and every spring and fall monitoring data and every spring and fall thereafter for the life of the project.

Exhibit 321

HHSEGS Distance - Drawdown Plot

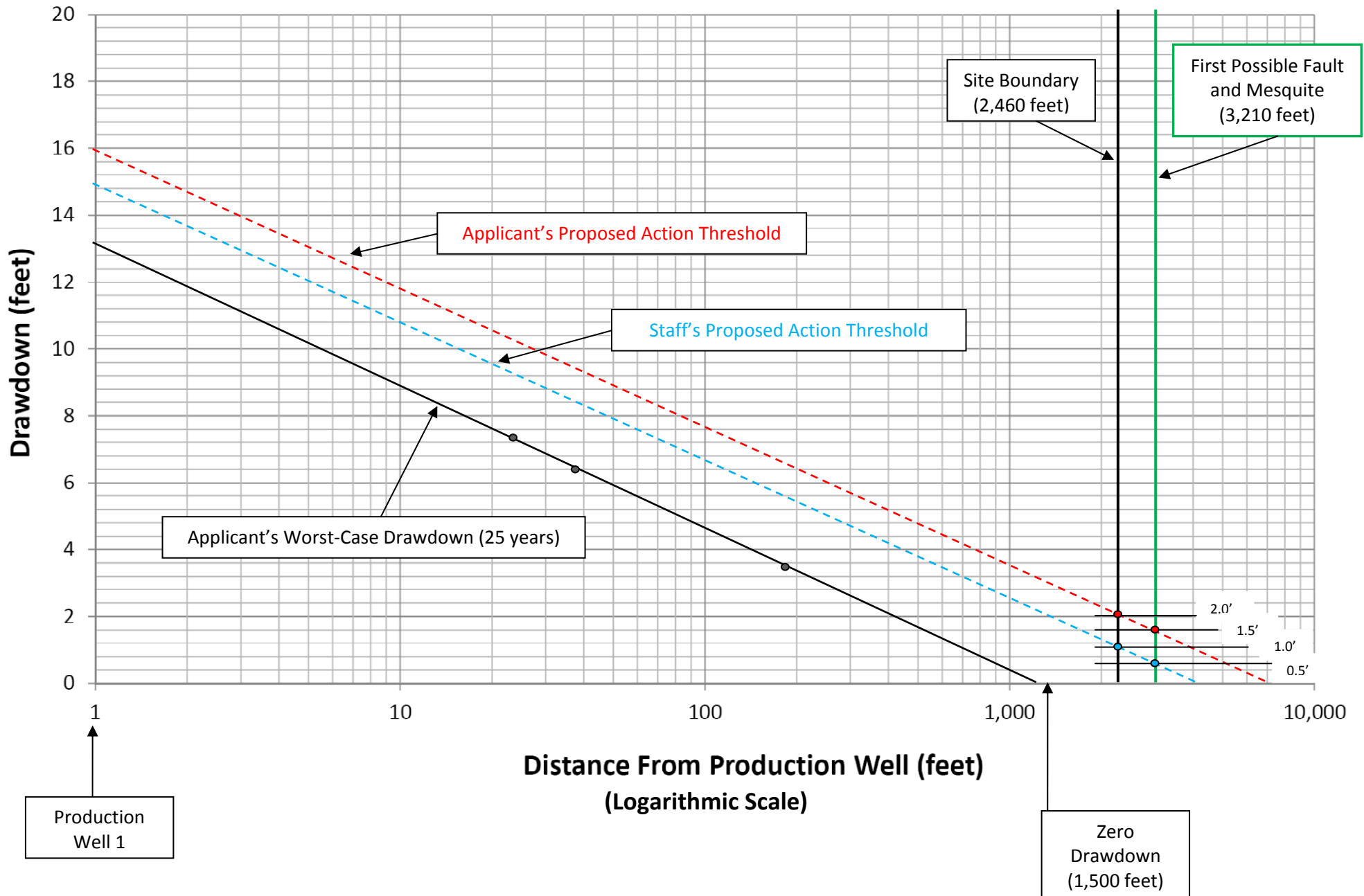
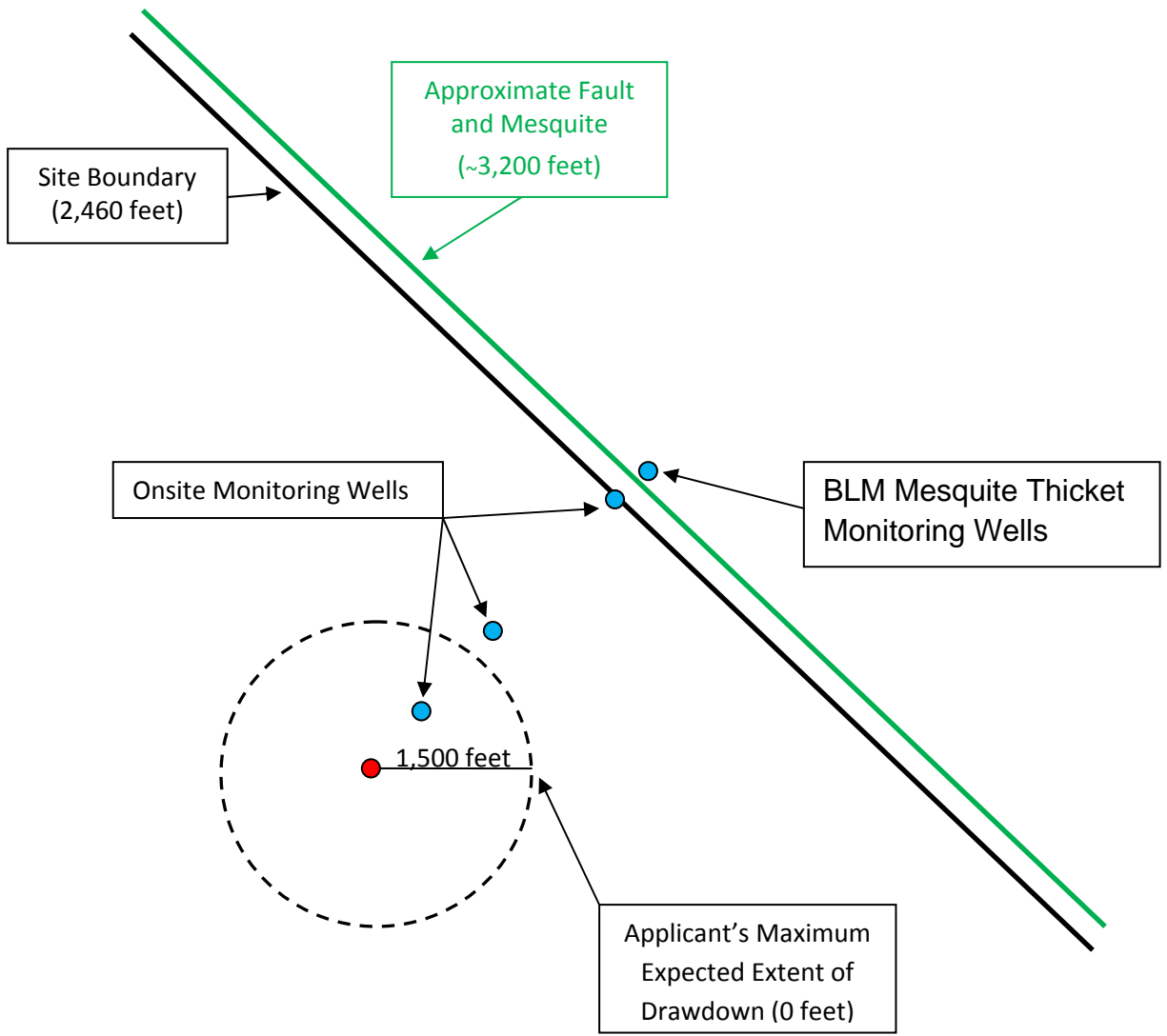


Exhibit 322



HHSEGS Site – Northern Production Well and Conceptual Monitoring Well Network

**[PROPOSED] ORDER
GRANTING MOTION TO
SUBMIT ADDITIONAL EXHIBITS**

For the reasons stated in the Energy Commission Staff's *Motion to Submit Additional Exhibits*, filed herein February 25, 2013, the Hidden Hills Presiding Member hereby GRANTS the motion.

Staff's Exhibits 304-324 may be filed in this proceeding.

Staff's Exhibits previously marked 500 – 503 and re-marked 300 – 303, respectively.

All parties may move to introduce additional exhibits by March 1, 2013.

Dated: _____

KAREN DOUGLAS
Commissioner and Presiding Member
HHSEGS AFC Committee



**BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT
COMMISSION OF THE STATE OF CALIFORNIA
1516 NINTH STREET, SACRAMENTO, CA 95814
1-800-822-6228 – WWW.ENERGY.CA.GOV**

**APPLICATION FOR CERTIFICATION FOR THE
HIDDEN HILLS SOLAR ELECTRIC
GENERATING SYSTEM**

Docket No. 11-AFC-02

**PROOF OF SERVICE
(Revised 2/21/13)**

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COMMISSION DOCKET UNIT

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**OTHER ENERGY COMMISSION
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CONVENIENCE ONLY):**

*After docketing, the Docket
Unit will provide a copy to the
persons listed below. Do not
send copies of documents to
these persons unless
specifically directed to do so.*

KAREN DOUGLAS
Commissioner and Presiding
Member

DAVID HOCHSCHILD
Commissioner and Associate
Member

Ken Celli
Hearing Adviser

Galen Lemei
Adviser to Presiding Member

Jennifer Nelson
Adviser to Presiding Member

TBD
Adviser to Associate Member

Eileen Allen
Commissioners' Technical
Adviser for Facility Siting

DECLARATION OF SERVICE

I, *Pamela Fredieu*, declare that on *February 25, 2013*, I served and filed copies of the attached *ENERGY COMMISSION STAFF MOTION TO CORRECT EXHIBIT NUMBERS AND SUBMIT ADDITIONAL EXHIBITS 304-324*, dated *February 25, 2013*. This document is accompanied by the most recent Proof of Service, which I copied from the web page for this project at: <http://www.energy.ca.gov/sitingcases/hiddenhills/>.

The document has been sent to the other persons on the Service List above in the following manner:

(Check one)

For service to all other parties and filing with the Docket Unit at the Energy Commission:

 X I e-mailed the document to all e-mail addresses on the Service List above and personally delivered it or deposited it in the US mail with first class postage to those parties noted above as "hard copy required"; OR

 Instead of e-mailing the document, I personally delivered it or deposited it in the US mail with first class postage to all of the persons on the Service List for whom a mailing address is given.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct, and that I am over the age of 18 years.

Dated: *February 25, 2013*

 /s/
Pamela Fredieu
Legal Secretary