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February 9, 2012

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Mike Monasmith
Senior Project Manager
Systems Assessment & Facility Siting Division
California Energy Commission
1516 Ninth Street, MS-15
Sacramento, CA 95814

Subject: Data Response, Set 2A
Hidden Hills Solar Electric Generating System (11-AFC-2)

Dear Mr. Monasmith:

On behalf of Hidden Hills Solar I, LLC; and Hidden Hills Solar II, LLC, please find attached an electronic copy of Data Response, Set 2A in response to Staff's Data Request Set 2A filed on January 9, 2012.

Hard copies will be sent out tomorrow. Please call me if you have any questions.

Sincerely,

CH2M HILL

John L. Carrier, J.D.
Program Manager

Encl.

c: POS List
Project file

Data Response 2A

Hidden Hills

Solar Electric Generating System

(11-AFC-2)

Application for Certification

Hidden Hills Solar I, LLC; and Hidden Hills Solar II, LLC

February 9, 2012

With Technical Assistance from

CH2MHILL®

IS061411043744SAC

Hidden Hills Solar Electric Generating System (HHSEGS)

(11-AFC-2)

Data Response, Set 2A
(Response to Data Requests 136 through 143)

Submitted to the

California Energy Commission

Submitted by

Hidden Hills Solar I, LLC; and
Hidden Hills Solar II, LLC

February 9, 2012

With Assistance from
CH2MHILL
2485 Natomas Park Drive
Suite 600
Sacramento, CA 95833

Contents

Figures

Introduction

Attached are Hidden Hills Solar I, LLC, and Hidden Hills Solar II, LLC (collectively, "Applicant") responses to the California Energy Commission (CEC) Staff's data requests numbers 136 through 143 for the Hidden Hills Solar Electric Generating System (HHSEGS) Project (11-AFC-2). The CEC Staff served these data requests on January 9, 2012. The responses are grouped by individual discipline or topic area. Within each discipline area, the responses are presented in the same order as provided by CEC Staff and are keyed to the Data Request numbers (136 through 143). New graphics or tables are numbered in reference to the data request number. For example, the first table used in response to Data Request 137 is numbered Table DR137-1. The first figure used in response to Data Request 137 is Figure DR137-1, and so on.

Figures submitted in response to a data request are grouped together at the end of this document and are also numbered to match the data request number. The figures are in numerical order.

Air Quality (136)

BACKGROUND

The applicant expects facility GHG emissions to be 99,700 tons/yr, just under the PSD trigger threshold of 100,000 tons/yr. However, the applicant does not include GHG emissions from mirror washing activities in total facility emissions although they estimate washing activities at a large fraction of boiler emissions, 25,673 tons/yr. US EPA indicates that the vehicle portion of the washing operations may not be required for this threshold determination because mobile sources are exempt from GHG calculations, but the portion of GHG emissions from powering the water pumps for washing purposes must be included.

DATA REQUEST

136. Staff needs the applicant to break down total annual GHG mirror washing emissions into one component for transporting the washing apparatus, and a separate component to power the mirror washing pumps.

Response: Applicant has not included GHG emissions from mirror washing activities in total facility GHG emissions because the PSD program applies to emissions from stationary sources. Applicant believes that based on the regulatory definition of a stationary source for the PSD program, and for the reasons presented below, mirror washing activities do not qualify as stationary sources. The GHG emissions presented in AFC Table 5.1B-11 were calculated based on total estimated fuel use for all mirror cleaning activities, which is based in turn on estimated hours of engine operation. Separate fuel use estimates for mirror washing machine travel and for water pump activity are not available, so separate emissions calculations cannot be provided. While it might be possible to further estimate the breakdown of fuel use between travel and water pump activities, such an estimate would be speculative at best. Further, because emissions from the mirror washing vehicles are not attributable to the stationary source during either operating mode, and thus are not considered for PSD purposes, any estimate produced would not provide any useful information beyond the estimate of total GHG emissions from mirror washing activities, which has already been provided in the AFC. Therefore, there is no need to break down the total GHG emissions for mirror washing activities into separate components.

Applicant has discussed this issue with staff of EPA Region 9. EPA staff concurs that if the engine or engines in the mirror washing machines are EPA-certified nonroad engines, the emissions from those engines are not emissions from a stationary source and therefore are not included in determining whether the HHSEGS project is subject to PSD review. In the event Applicant decides to use on-road-certified engines in the Mirror Washing machines (MWMs), Applicant will discuss the applicability of GHG emissions from mirror washing activities for PSD review further with EPA staff. However, as explained below, Applicant does not believe that the use of on-road certified engines should change the analysis.

Applicant believes that pursuant to the Clean Air Act and its implementing regulations, GHG emissions from mirror washing activities are appropriately excluded from the calculation of the HHSEGS stationary source emissions to determine whether the project is subject to PSD review, regardless of whether the MWMs are equipped with nonroad-certified or on-road-

certified engines. As set forth in Title 40 Section 52.21 of the Code of Federal Regulations ("CFR") (Prevention of significant deterioration of air quality), the applicability of the PSD program and its requirements are specific to stationary sources:

> (i) The requirements of this section apply to the construction of any new major stationary source…[1]

Therefore, only emissions from stationary sources are included in an evaluation of PSD applicability. Section 7602(z) of the Clean Air Act defines "Stationary source" as:

> The term 'stationary source' means generally any source of an air pollutant except those emissions resulting directly from an internal combustion engine for transportation purposes or from a nonroad engine or nonroad vehicle as defined in section 7550 of this title.

As discussed below, Applicant believes that under all scenarios, exhaust emissions from the MWMs would not be considered part of the stationary source under the PSD regulations:

1. *While the MWMs are moving around the site, the engines that propel the MWMs are not stationary sources.*

   Emissions from an internal combustion engine that is used for transportation purposes are not emissions from a stationary source and are not included in any determination of PSD applicability. When the MWMs are moving around the site, their engines are being used for transportation purposes and therefore their emissions are specifically excluded as emissions from the stationary source by Section 7602(z), no matter what type of internal combustion engine is used to power them.

2. *If the MWM engine or engines are certified nonroad engines, then the MWMs are not stationary sources.*

   Section 7550 of the Clean Air Act defines "nonroad engine" and "nonroad vehicle" as follows:

   > (10) The term "nonroad engine" means an internal combustion engine (including the fuel system) that is not used in a motor vehicle or a vehicle used solely for competition, or that is not subject to standards promulgated under section 7411 [NSPS] of this title or section 7521 [Emission standards for new motor vehicles or new motor vehicle engines] of this title.
   >
   > (11) The term "nonroad vehicle" means a vehicle that is powered by a nonroad engine and that is not a motor vehicle or a vehicle used solely for competition.

   For the purposes of Section 7550, "nonroad engine" is defined in Title 40, Section 1068.30 of the Code of Federal Regulations as:

[1] 40 CFR 52.21, Prevention of significant deterioration of air quality; (a)(2) *Applicability procedures*.

> Nonroad engine means:
>
> (1) Except as discussed in paragraph (2) of this definition, a nonroad engine is any internal combustion engine: [2]
>
> (i) In or on a piece of equipment that is self-propelled **or serves a dual purpose by both propelling itself and performing another function** (such as garden tractors, off-highway mobile cranes and bulldozers); or
>
> (ii) In or on a piece of equipment that is intended to be propelled while performing its function (such as lawnmowers and string trimmers); or
>
> (iii) That, by itself or in or on a piece of equipment, is portable or transportable, meaning designed to be and capable of being carried or moved from one location to another. Indicia of transportability include, but are not limited to, wheels, skids, carrying handles, dolly, trailer, or platform. (Emphasis added.)

For MWMs, nonroad engines would serve a dual purpose by both propelling the nonroad vehicle and performing another function, powering the water pump for mirror washing activities. Therefore, the emissions from those engines are specifically excluded as emissions from the stationary source pursuant to Section 7602(z), regardless of whether that engine is being used for transportation or for powering the water pumps.

3. *If the MWMs use a single on-road-certified engine for both transportation and driving the water pumps, then they are motor vehicles, not stationary sources.*

If the mirror washing vehicles are equipped with a single on-road-certified engine, then they are motor vehicles. Their emissions are regulated under Title II of the Clean Air Act and are not attributable to the stationary source regardless of how the engine is used (that is, whether it is used for transportation purposes or to power a water pump). As described at Note #9 of Page 26403, Volume 43 of the Federal Register:

> Where a new source will result in specific and well defined secondary emissions which can be accurately quantified, the reviewing authority should consider such secondary emissions in determining whether the source would cause or contribute to a violation of an ambient ceiling or increment. However, since EPA's authority to perform or require indirect source review relating to mobile sources regulated under Title II of the Act (motor vehicles and aircraft), has been restricted by statute, consideration of the

[2] 40 CFR § 1068.30 paragraph (2) also provides that an internal combustion engine is not a nonroad engine if it is a certified on-road engine (subparagraph (i)):

> (i) The engine is used to propel a motor vehicle, an aircraft, or equipment used solely for competition, or is subject to standards promulgated under section 202 of the Act (42 U.S.C. 7521); or
> (ii) The engine is regulated by a federal New Source Performance Standard promulgated under section 111 of the Act (42 U.S.C. 7411); or
> (iii) The engine otherwise included in paragraph (1)(iii) of this definition remains or will remain at a location for more than 12 consecutive months or a shorter period of time for an engine located at a seasonal source. A location is any single site at a building, structure, facility, or installation…

> indirect impacts of motor vehicles and aircraft traffic is not required under this Ruling.[3]

If emissions from motor vehicles regulated under Title II of the CAA were included in PSD analyses, there would be no need to address them separately as potential secondary sources.

In summary, regardless of whether the MWMs use certified nonroad or certified on-road engines, the exhaust emissions from MWMs would not be considered part of the stationary source under the PSD regulations for the following reasons:

1. A single certified nonroad engine: explicitly exempted by CAA §7602 (z)
2. Two separate certified engines, one for transportation and the other for pumping: explicitly exempted by CAA §7602 (z) because the first is used for transportation and the second is by definition a nonroad engine
3. A single certified on-road engine in a motor vehicle: not considered under PSD because on-road engines are directly regulated under Title II of the Clean Air Act

Because the exhaust emissions from MWMs are not part of the stationary source, their emissions are not considered in evaluating PSD applicability. Therefore, there is no need to break down the GHG emissions for mirror washing activities into components.

[3] 43 FR 26379 et seq: 1977 Clean Air Act; Prevention of Significant Air Quality Deterioration; Monday, June 19, 1978

Alternatives (137-140)

BACKGROUND

On November 17, Data Requests Set 1C was submitted to the project applicant, which included a request for additional information on the applicant's decision to reject the Sandy Valley alternative site (Data Request #77). Responses to this data request were received on December 19. In those responses, the applicant reiterated information from the Application for Certification (AFC) and stated that the Sandy Valley alternative site "was not carried forward due to the infeasibility of acquiring site control for the necessary acreage due to the vast number of private landowners."

Staff observes that additional information is necessary to complete an analysis that complies with the requirements of the California Environmental Quality Act (CEQA), including Section 15126.6 of the CEQA Guidelines (State CEQA Guidelines). The discussion of alternatives to the proposed project must "describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives" (14 Cal. Code Regs., § 15126.6[a]). The State CEQA Guidelines further require that the discussion shall be focused on alternatives "which are capable of avoiding or substantially lessening any significant effects of the project, *even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly*" [emphasis added] (14 Cal. Code Regs., § 15126.6[b]).

The applicant's responses to Data Request #77 include Figure DR77-1, which provides partial information on private land ownership in the Sandy Valley area. Public lands generally surround an area where eight landowners are identified. Ownership for many properties within the area is not provided. No acreage data is provided in the text or the figure. The information provided in Figure DR77-1 is incomplete and does not provide a sufficient basis for the conclusion of infeasibility.

Alternatives Table 1 includes information provided by the project applicant for the Sandy Valley alternative site. The table was part of Data Request #77; text has since been added (italic type) to show new information provided by the applicant in their December 19, 2011 Data Responses (Set 1C). Staff's Data Request #137 pertaining to the Sandy Valley alternative site follows Table 1; text additions to the previously-issued Data Request #77 are shown in italic type.

Alternatives Table 1 Information from the Project Applicant on the Sandy Valley Alternative Site	
Criteria	**Sandy Valley Alternative Site**
Area and slope	Uncertain whether contiguous land of adequate size is available. No information on slope is provided.
Ability to obtain site control	Sufficient private land may be available, but many parcels are in agricultural use.
General plan and zoning	*Based on review of Inyo County's online information, the Sandy Valley lands appear to be in the Agriculture (A) land use designation. The Inyo County zoning primarily appears to be Open Space with a minimum 40-acre parcel size (OS-40).*
Transmission lines	Approximately 50 miles of new transmission line required.
Natural gas pipeline	The Kern River Gas Transmission pipeline is about 25 miles away.
Water supply	Individual wells supply water.
Desert tortoise	The site is among the alternatives with the highest ratings for tortoise habitat suitability; however, much of the land has already been disturbed by agricultural use. Staff notes that the USGS habitat rating is 0.6, and the site is adjacent to areas with ratings of 0.5 and 0.6.
Mohave ground squirrel	No information provided, but staff notes that the site is not within the range of Mohave ground squirrel.
Visual quality	No information provided.
Economic viability	"Medium" because the linears are long, but not as long as for other alternative sites. Staff notes that the linears for the Sandy Valley alternative are comparable to those proposed for the HHSEGS project. The proposed project would require either 39 miles or 67 miles of new transmission line, depending on the selected transmission option.
Site access	*There are public roads in the surrounding vicinity, as demonstrated on local mapping software.*

DATA REQUEST

137. Sandy Valley Alternative Site – Please provide the following:

Applicant's Overview to Responses:

Responses to each specific data request DR 137 "a" through "o" follow each individual request, and will focus on the "Solar Plant Alternative" identified on Figure DR137-1. The Solar Plant Alternative site is located entirely in Inyo County and is in an isolated agricultural community of Sandy Valley with a surrounding desert setting located about 21 miles west of Interstate 15 and Jean, Nevada. There is no paved access to the community from Inyo County. Turf farming is the dominant use of land in the Inyo County portion of the Sandy Valley area. Most of the Sandy Valley area is located in Clark County, Nevada and San Bernardino County, California and is a rapidly growing area characterized by both rural residential and agricultural uses. There are only a few residential units in the Inyo County portion of the Sandy Valley area (approximately 10). This area is served by individual water wells and septic systems. Death Valley Unified School District provides K-12 education. The community is within the boundaries of the Southern Inyo Fire Protection District. Due to the proximity to Clark County, Nevada, the first responders for fire, medical, or law enforcement emergencies come from Nevada.

a. Information on slope and potential available acreage in the area, including potentially available contiguous acreage in the northeast corner of San Bernardino County. Include a map showing a possible project site and footprint. *Provide the shapefile for the figure, including attribute information.* Describe the topography and elevations in the area.

Response: The total potential acreage for a Solar Plant Alternative that is located in Inyo County and not within a wilderness area is 3,119 acres—which is smaller than the HHSEGS project site. A possible project site footprint is shown on Figures DR137-1, titled "Potential Site Alternative and Parcels for Inyo County," and DR137-2, titled "Potential Site Alternative, Parcels for Inyo County and Elevation Reference." As shown on Figure DR137-2, this site has relatively flat topography. The requested shape files are included in the enclosed CD, five copies of which are being provided to CEC staff.

b. *Comprehensive* information on the number of landowners with property in the area. Discuss land ownership for the area and the acreage of land that is privately owned.

Response: Table DR137-1 includes comprehensive information on the number of property owners in the Solar Plant Alternative area and the acreage of the parcels. As shown on the table, there are 23 privately owned parcels within the Solar Plant Alternative site. According to land ownership records, the 23 parcels are owned by 16 separate entities. The total acreage of privately owned parcels in the possible site footprint is 1,452 acres. This acreage constitutes only 44 percent of the land area needed for the project (3,277 acres). In addition, as shown in Figure DR137-1, the privately owned land is split into two smaller areas separated by sections of government-owned land, making placement of the project on privately owned land unworkable. Furthermore, even if government-owned land were included in the potential plant footprint, the total area within Inyo County of 3,119 acres does not provide enough

acreage for the project. Finally, were there enough acreage to site the plant at this location, compared to the HHSEGS site, the feasibility of securing site control from this many property owners renders this alternative site infeasible from a transactional, financial, and project development scheduling perspective.

TABLE DR137-1
Property Ownership in Solar Plant Alternative Area of Sandy Valley, Inyo County

	Inyo County				
APN	**Zoning**	**GP**	**Legal Description**	**Land Type**	**Acres**
04835024	OS-40	A	SW4SE4 SEC 33 T20NR12E SUBJ TO 30' RD ESMT	Private	41.0
04835021	OS-40	A	NW4SE4 SEC 33 T20NR12E SUBJ TO 30' RD ESMT	Private	40.9
04835037	OS-40	A	SW4 SEC 34 T20NR12E SANDY VLY CC263	Private	164.3
04835025	OS-40	A	NE4NE4 SEC 33 T20NR12E SANDY VLY	Private	40.7
04835038	OS-40	A	NW4 SEC 34 T20NR12E SANDY VAL CC263 PCL 1	Private	163.5
04835002	OS-40	A	SW4SE4 SEC 28 T20NR12E SANDY VLY	Private	40.6
04835015	OS-40	A	SW4 SEC 29 T20NR12E SANDY VLY	Private	160.2
04835023	OS-40	A	SE4SE4 SEC 33 T20NR12E SUBJ TO 30' RD ESMT	Private	41.2
04835033	OS-40	A	POR N2S2 SEC 35 T20NR12E SANDY VLY CC130	Private	41.3
04835034	OS-40	A	LOT 6,N2S2 SEC 35 T20NR12E SANDY VLY CC130	Private	39.1
04835028	OS-40	A	SE4NE4 SEC 33 T20NR12E	Private	40.9
04835026	OS-40	A	NW4NE4 SEC 33 T20NR12E SANDY VLY	Private	40.5
04835032	OS-40	A	SE4SE4 SEC 29 T20NR12E SUBJ TO 30'RD ESMT	Private	40.5
04835006	OS-40	A	LOT 5 SEC 35 T20NR12E SANDY VLY	Private	39.0
04835022	OS-40	A	NE4SE4 SEC 33 T20NR12E SUBJ TO 30' RD ESMT	Private	41.1
04835020	OS-40	A	W880' SE4 SEC 34 T20NR12E SANDY VLY	Private	54.7
04835019	OS-40	A	SE4 SEC 34 EX E880',W880' T20NR12E SANDY VLY	Private	55.8
04835018	OS-40	A	E880' SE4 SEC 34 T20NR12E SANDY VLY	Private	53.3
04835027	OS-40	A	SW4NE4 SEC 33 T20NR12E SANDY VLY	Private	40.7
04835005	OS-40	A	NW4NE4,S2NE4,LOT1 SEC 34 T20NR12E SANDY VLY	Private	151.8
04835031	OS-40	A	SW4SE4 SEC 29 T20NR12E SUBJ TO 30'RD ESMT	Private	40.3
04835029	OS-40	A	NE4SE4 SEC 29 T20NR12E SUBJ TO 30'RD ESMT	Private	40.3
04835030	OS-40	A	NW4SE4 SEC 29 T20NR12E SUBJ TO 30'RD ESMT	Private	40.2
Subtotal Private Ownership					**1,452.1**
04835035	OS-40	A	S2S2 FRAC SEC 35 T20NR12E	BLM	124.4
04835016	OS-40	A	SEC 32,W2 33 T20NR12E	BLM*	968.8
04835036	OS-40	A	POR SEC 28,29,FRAC 27 T20NR12E	BLM*	1,117.3
04875001	OS-40	SFL	SEC 19,30,31,POR 7,18,20,21 T20NR12E	BLM**	3,697.7
Subtotal Public Ownership					**5,908.2**

Notes:
APN = Assessor Parcel Number
OS-40 = Open Space 40-acre minimum
A = Agricultural
SFL = State and Federal lands
* A portion of this BLM parcel is wilderness area.
** Most of this BLM parcel is wilderness area.

c. Information on public lands in the area. Describe applicability of the U.S. Bureau of Land Management's plan for the Northern and Eastern Mojave Planning Area to land uses in the area.

Response: The HHSEGS site is located entirely on privately held lands and is therefore not subject to conformance with BLM land management policies. For the Solar Plant Alterative site, as shown on Figure DR137-3, the northern portion of the site is in an area that includes federal lands. The portion of the site comprised of federal lands would be subject to the BLM's plan for the Northern and Eastern Mojave Planning Area. Therefore, placing a solar project in the Solar Plant Alternative site would likely require an amendment to that plan.

d. Information on Inyo County's general plan designation and zoning for private land in the area. *Please confirm the accuracy of the information provided in the data response on Inyo County's designated land use and zoning district for the area. Include information on San Bernardino County's general plan designation and zoning for private land in the area.*

Response: Figure DR137-3 identifies the general plan and zoning designations for the Solar Plant Alternative. Under the Inyo County General Plan, the Solar Plant Alternative site is designated either as Agriculture or State and Federal Lands. Additionally, Policy LU-1.6 of the Inyo County General Plan provides that the County shall preserve agricultural and related open space uses on private lands and will not designate additional land for rural residential development. The zoning for the Solar Plant Alternative site is mostly Open Space (OS-40).

e. Description of existing land uses at the site and in the surrounding area. Include acreage figures *and crop types* for areas in agricultural uses.

Response: The following land uses have been identified at the Solar Plant Alternative site and surrounding area: isolated rural residences, turf farming, fallow agricultural fields, deserted trailers, and illegal trash dumping. Several of the residences appeared to be occupied and are maintained. The acreage of these uses is presented in Table DR137-1.

f. Information on site access from public roads in the area. *Add public roads and highways to the figure showing private land ownership for the area, or provide a separate figure that shows access routes.*

Response: Figure DR137-4 shows the roadway system in the vicinity of the Solar Plant Alternative and the distance to the nearest interstate freeway. As mentioned in the Applicant's overview to this data response, there is no paved access to the community from Inyo County. In addition to state, federal, and county maintained roadways, there are numerous dirt roads transecting this area along section lines and along the California/Nevada border.

g. Details and a map on a plan and route for a transmission line interconnection at the Eldorado Substation. Also address the feasibility of connecting to the Mt. Pass substation approximately 30 miles southeast. Estimate the cost for generation tie (gen-tie) lines to the Eldorado and Mt. Pass substations.

Compare those costs to the known or estimated cost for the gen-tie line for the HHSEGS project.

Response: Figure DR137-5 presents alternatives for transmission interconnection at the Eldorado Substation as well as the Mt. Pass Substation. Distances of these linear corridors are included in the figure. The feasibility of interconnecting at this location cannot be determined without a system impact study, which would require the filing of an application with the CAISO for inclusion in a Cluster Study that would substantially lag behind the HHSEGS pending application. Applicant does not possess the information to estimate the cost for gen-tie lines to Eldorado and Mt. Pass substations, and such information is not reasonably available without a system impact study.

h. Information and a map showing a potential connection to the Kern River Gas Transmission pipeline.

Response: Figure DR137-6 shows two potential corridors for connection of the Solar Plant Alternative site to the Kern River Gas Transmission pipeline. The distances of these linear corridors are 14.5 to 15.5 miles long.

i. Discussion of the state of groundwater levels in the basin, including a discussion of whether the basin is in an overdraft or recovery state. Identify opportunities to mitigate potential impacts to groundwater.

Response: The Solar Plant Alternative is located generally in the central portion of the Mesquite Valley Groundwater Basin within the South Lahontan Hydrologic Region. The following information was obtained from the California Department of Water Resources (DWR, 2004), California's Groundwater – Bulletin 118. Basin Descriptions: Mesquite Valley Groundwater Basin. Based on the information provided in the bulletin, groundwater levels in the central and northern portion of the basin have generally been declining since the mid-1950s. This is likely a result of the numerous agricultural uses in the area.

Basin Boundaries and Hydrology

The Mesquite Valley Groundwater Basin underlies a northwest-trending valley located along the California-Nevada border in northeast San Bernardino and southeast Inyo counties. Elevation of the valley floor ranges from 2,540 feet at Mesquite (dry) Lake (located approximately 10 miles southeast of the Solar Plant Alternative site) to about 2,700 feet above mean sea level at the northeast end of the valley. The basin is bounded by non-waterbearing rocks of the Kingston Range on the northwest, the Mesquite Mountains on the west, the Clark Mountains on the south, and by an alluvial drainage divide on the north. Although the physical groundwater basin extends into Nevada, this information assumes the California-Nevada state line as the northeastern boundary. Average annual precipitation ranges from about 4 to 6 inches. Surface runoff from the bordering mountains drains toward Mesquite Lake (DWR, 2004).

Recharge and Discharge Areas

The principal source of recharge to the basin is the percolation of runoff through alluvial deposits at the base of the bordering mountains, and from the infiltration of

precipitation that falls to the valley floor. Groundwater in the younger and underlying older alluvium moves, as does surface runoff, towards Mesquite Lake. Confinement of the groundwater body occurs beneath and along the margins of the lake. Groundwater discharge occurs mainly through pumpage by wells or by evapotranspiration (DWR, 2004).

Groundwater Level Trends

The record of groundwater levels in the California portion of the basin intermittently spans 1954 through 1984. North of Mesquite Lake in the central part of the basin and near the site, water levels declined by about 3.2 feet from 1959 to 1979 at one location and declined at another location by about 2.0 feet during 1979 through 1984 (Figure DR137-7). Depth to water between the two locations ranged from about 10 to 40 feet below the surface. In the north portion of the basin, water level information is sparse but show that levels declined by about 2.8 feet from 1956 through 1964. Depth to water at this location was between about 50 and 53 feet below the surface. Further north of this location, water levels declined by approximately 2.2 feet over the same period, with a depth to water ranging from about 127 to 130 feet below the surface.

The total storage capacity within California is estimated to be about 580,000 af (DWR, 2004). Groundwater in storage is unknown and the Groundwater budget information is not available.

Groundwater Quality

The character of the groundwater generally varies from calcium-magnesium bicarbonate to magnesium-calcium bicarbonate in the northern half of the basin and is generally sodium chloride in the southern half of the basin. In general, the quality of groundwater in the northern half of the basin is suitable for most beneficial uses. Elevated concentrations of chloride and sodium impair the water for use in irrigation, and fluoride concentrations in some parts of the basin are at levels marginal for domestic consumption.

References

California Department of Water Resources (DWR). 2004. California's Groundwater – Bulletin 118. Basin Descriptions: Mesquite Valley Groundwater Basin. Available online at: http://www.water.ca.gov/pubs/groundwater/bulletin_118/basindescriptions/6-29.pdf

j. Details on the individual water supply wells in the area, including the number of wells and current uses. Discuss any water allocations for agricultural use, and identify the potential source(s) of water for this alternative.

Response: Based on a preliminary search of the DWR online mapping system, there are 2 monitoring stations located in the vicinity of the site. However, historical groundwater data is only available for one location. A map of the monitoring wells is presented in Figure DR137-8 and a graph of the available data is presented in Figure DR137-7. As shown in the graph, the groundwater level at this location has been in decline. The current well use for this station is undetermined.

Reference

Well information is available online at:

http://www.water.ca.gov/waterdatalibrary/groundwater/hydrographs/report_html.cfm?wellNumber=19N12E13D001S

k. Information on the visual quality of the area. Include a discussion of how the project might impact views from the Pahrump Valley Wilderness. Compare the visual quality of this alternative location to the HHSEGS project area.

Response: Development of a SEGS at the Solar Plant Alternative site would increase the amount of visible development and incrementally contribute to a loss of rural and natural character in the surrounding area. The immediate project vicinity is currently a relatively undeveloped area with limited rural residences in Inyo County and more residential development adjacent to the Solar Plant Alternative site in San Bernardino County and in the Sandy Valley community in Clark County, Nevada. In addition, the Solar Plant Alternative site is immediately adjacent to the Pahrump Valley Wilderness Area. In contrast, the HHSEGS site is located 2 miles north of the Pahrump Valley Wilderness Area.

l. Information on habitat types and protected plant and wildlife species that could be present in the area. Include data obtained from a California Natural Diversity Database record search for the area.

Response: Figure DR137-9 shows USGS desert tortoise habitat model results in the vicinity of the potential project alternative. In addition, Figure DR137-10 shows the results of a CNDDB record search for a 10-mile radius from the site. The Solar Plant Alternative site is located in an area depicted with some suitable habitat for desert tortoise. Figure DR137-10 shows that some special-status plants have also been reported in that portion of the valley. However, with the presence of the current land uses, presence of desert tortoises and special-status plants on the privately owned parcels is less likely. However, they could be present on the BLM-managed lands. With the implementation of mitigation measures, and in compliance with state and federal endangered species act requirements, impacts to desert tortoise and any special-status plants would be mitigated to acceptable levels.

m. Information on the sensitivity of the area for cultural resources and the potential for discovery of cultural artifacts.

Response: The Solar Plant Alternative has not been the subject of extensive cultural resource investigation, therefore information regarding cultural sensitivity can only be approximated from recorded resources within the vicinity of the alternative site, and from cursory observations of the general environmental setting of the site. There are three recorded resources within close proximity to this site. The Old Spanish Trail/Mormon Road (also known as the Old Spanish Trail and the Old Spanish National Historic Trail) is located less than 5 miles north of the alternative project site running east to west and could suggest the presence of other cultural resources in the area. The route is considered a trail of national significance that is related to the exploration, migration, settlement, and building of commerce of the western United States. From the vicinity of Goodsprings, Nevada (approximately 10

miles east of alternate site) one variant of the trail, the Armijo Route, crosses west through the Ivanpah Valley to Mountain Pass, and then to Soda Springs before connecting with the Mojave River in the vicinity of present-day Barstow, California. The second recorded resource is Yellow Pine Mining District located near Goodsprings which was established in 1882 and active until the 1960's approximately 10 miles west of this site. In addition, Stump Springs, located northwest of the Sandy Valley site is known to have high sensitivity for prehistoric archaeological resources and has significance to local Native Americans.

As compared to the proposed site, the Solar Plant Alternative site has similar potential for cultural impacts. Each site is located sufficiently distant from dry lakes so as to minimize the potential for encountering cultural resources as evidenced from other projects. Both sites are located on alluvial fans where ground conditions are dominated by heavily disturbed braided ephemeral drainages caused by active erosion from flash flooding and other natural processes. These processes tend to bury or obliterate evidences of archaeological sites. The HHSEGS site and this site are also similar in their potential to impact linear historic architectural resources, such as historic electrical transmission lines, roadway alignments, and railroads. Based on these findings, it appears that archaeological resources sensitivity is low to moderate. Although the proposed alternative project site has not been subject to a pedestrian inventory, potentially significant archeological and historical resources could be present in these unsurveyed areas and be encountered during subsurface construction activities. However, with the implementation of standard mitigation measures, impacts to cultural resources would be mitigated to acceptable levels.

n. Description of how the economic viability of this alternative compares to the HHSEGS project.

Response: The Solar Plant Alternative is not an economically viable alternative to the HHSEGS project for several reasons. Securing site control for the Solar Plant Alternative would be extremely difficult, if not impossible, and a time consuming process given the high number of privately owned parcels. The difficulty of obtaining site control would be compounded by the complexity of also having to file an SF 299 for the BLM land portion. The Solar Plant Alternative site is comprised of 23 non-government owned parcels as shown on Figure DR137-3 and in Table DR134-1, which are owned by 16 different parties . Because Applicant is a private company without the power of eminent domain, bilateral negotiations with each landowner is the only way to secure site control. Compared to the HHSEGS site, Applicant would have to separately negotiate commercial terms with the owner of each parcel to secure site control. Furthermore, the high number of parcels involved increases the risk that a landowner could choose not to sell, lease or option the parcel to Applicant, and increases the risk that other landowners may "hold out" from agreeing to terms to obtain a better deal. Obtaining agreements from all of the property owners increases the difficulty of achieving site control. The length of time to negotiate site control, in addition to the costs involved with so many different parcels, renders this alternative site infeasible from a transactional and financially feasible perspective.

In addition, the linear corridors for the Solar Plant Alternative could be substantially longer. As shown in Figure DR137-5, the gen-tie line alternative to tie into the

proposed VEA 500-kV transmission line is 8.7 miles (compared to 10 miles for HHSEGS). However, if the VEA 500-kV transmission line were not available, the distance from the alternative site to the Eldorado substation is 43 miles and the shortest route to the Mt. Pass Substation is 42 miles. Similarly, as shown in Figure 137-6, for HHSEGS the gas line to tie into the 36-inch main line being proposed by VEA is 10 miles; whereas, the gas line to tie into the Kern River Gas Transmission line is 14.5 to 15.5 miles.

Moreover, construction costs would be higher at the Solar Plant Alternative location. Access to the site from I-15 is about 20 miles along a windy road (see Figure 137-4) and the availability of temporary workforce lodging at Primm, Nevada is about 33 miles, with South Las Vegas at about 42 miles, compared to only 29 miles from HHSEGS to Pahrump, Nevada.

o. *Information on any private lands available for sale in the Sandy Valley area.*

Response: CH2M HILL staff visited this site on Friday February 3, 2011 and did not observe the presence of any signage depicting property sales. Data collected from San Bernardino and Inyo County Assessor websites, as well as the Real Quest Professional database, indicate that on average, non-government-owned parcels within and in the vicinity of this alternate site have had the same property owners for over 10 years. Most have only changed ownership an average of once since original land purchase or construction (generally in the late 1970s to early 1980s). A search of property for sale in the Sandy Valley area suggests that no parcels within the alternative site boundary are currently listed for sale. Of the 30 non-government-owned parcels in the alternative site boundary, only one has been sold since 2008.

BACKGROUND

Subsection 6.7.1.1, in the AFC, "Central Tower with Integral Thermal Storage," briefly describes an alternative solar power tower project with integral thermal storage. The analysis summarizes problems for a project with integral thermal storage:

- Much higher costs than a project without integral thermal storage;
- Larger plant footprint to accommodate the thermal storage tanks;
- Increased risks related to the fluid becoming solid; and
- Hazards associated with the super-heated fluid, fires, or hazardous materials spills.

Staff notes that several articles published on Web sites since the AFC was filed in August 2011 indicate that BrightSource Energy is proposing the addition of thermal energy storage capability to its solar thermal power plants planned at two California sites in "Siberia and Sonoran West" (see the August and December 2011 EarthTechling articles referenced below). A recent press release from BrightSource Energy describes how adding storage to its power tower projects will provide utilities with "cost-competitive, reliable, and dispatchable clean power that meets peak demand" (see reference below).

According to statements by a representative from Southern California Edison (SCE) in an article recently published by Bloomberg's online business and financial information Web site, adding molten-salt storage at the BrightSource Energy facilities discussed above may improve energy production by 30 percent and allow the plants to have smaller footprints and use fewer materials (see reference below). Online sources, including the

BrightSource Energy press release, indicate that adding molten-salt energy storage to these projects will require amending the power purchase agreements with SCE.

Applicable information recently published on Web sites and reviewed by staff includes these sources:

http://www.earthtechling.com/2011/08/brightsource-adding-molten-salt-solar-storage/

http://www.brightsourceenergy.com/images/uploads/pressreleases/BSESCE PPA Storage 112811 FINAL.pdf

http://www.forbes.com/sites/toddwoody/2011/11/28/brightsource-strikes-worlds-biggest-solar-energy-storage-deal/

http://www.bloomberg.com/news/2011-11-29/edison-brightsource-power-contracts-changed-to-use-storage.html
http://www.earthtechling.com/2011/12/molten-salt-storage-coming-to-california/

DATA REQUEST

138. Please provide a revised discussion and updated analysis of the feasibility of adding energy storage capabilities to the proposed HHSEGS project. Please include the following:

Applicant's Overview to Responses

Applicant considers the addition of energy storage capabilities to the proposed HHSEGS project to be infeasible for three principal reasons:

1. **Contractual.** The two units of the proposed HHSEGS project are intended to service specific signed and approved Power Purchase Agreements (PPAs) that do not anticipate energy storage capabilities in either the contracted capacity factor or the contracted energy deliveries. The offtaker in these PPAs would not be obligated to purchase most or all of the additional electricity generated by implementation of an energy storage system. Moreover, it would not be feasible to complete the development and engineering of an energy storage system for HHSEGS on a timeline that would allow Applicant to meet its contractual obligations under the PPAs.

2. **Site limitations.** The proposed project fully uses the area of the HHSEGS site for two units without storage in meeting the delivery requirements of the two PPAs covering electricity generated at the site. It should be noted that the heliostat layout has been designed for maximum efficiency by Applicant, using sophisticated and patented algorithms and methods, to ensure maximum electricity generation possible from a number of heliostats that was calculated to maximize the economic viability of the project. Therefore, adding sufficient heliostats to properly utilize even a short (e.g., 2-hour) storage system would not be possible without adding substantial potential shadowing and blocking penalty that would limit the extent of any increment in electricity generation.

3. **Economics.** At this stage in the development and design process, the incorporation of energy storage to the HHSEGS project would be extremely costly, and would require, among other things, a substantial redesign of the heliostat field, design

engineering, and project layout, and would jeopardize the project's schedule and financial viability.

a. Information on new and modified equipment and processes to add molten-salt or other energy storage to the HHSEGS project. Discuss known or potential alterations to the project configuration and changes to the requisite number of heliostats.

Response: There are no known or planned potential alterations to the project configuration to add molten-salt or energy storage capability, or any changes to the requisite number of heliostats.

b. Information on the expected benefits of adding storage capabilities to the project. Include potential benefits pertaining to improved efficiency and capacity, reduced energy costs, smaller site footprint, increased flexibility, and other potential benefits. Include information comparing the benefits of the proposed HHSEGS project to potential benefits of a project that is altered to include storage.

Response: Because of the limitations described above, at this time analysis has shown that any potential benefits would be heavily outweighed by the costs, especially at this late stage in the development process.Average efficiency would be impaired rather than improved, energy costs would be increased rather than decreased, and the site footprint would be expanded (if that were possible).

c. Information comparing the environmental effects of the proposed HHSEGS project to a project that includes storage capabilities. Discuss in detail how altering the project configuration, reducing the project footprint, or changing project operations could affect the level of impacts on environmental resources, including potential impacts relating to water use, air quality, sensitive plant and animal species and habitats, cultural resources, and visual resources.

Response: Without design information for the HHSEGS project that specifically integrates storage capabilities, any information regarding potential environmental effects would be extremely speculative. However, as stated above, the addition of storage capabilities to HHSEGS would likely require the installation of additional heliostats given the planned configuration of the heliostat field. Hypothetically speaking, the additional heliostats could result in a proportionally higher water usage for mirror washing, as well as slightly more ground and plant disturbance.

d. Information on the extent to which a project with storage capabilities would satisfy the stated project objectives compared to the proposed HHSEGS project.

Response: Because the addition of energy storage would require substantial time and resources to modify the design of the HHSEGS, a project with storage technologies would not meet the stated project objectives of achieving the targeted commercial on-line date of first/second quarter 2015. A project with storage capabilities would

not satisfy the stated project objectives as well as the proposed HHSEGS project because the PPAs meant to be serviced by the HHSEGS project do not allow for the increased capacity factor or increased annual energy deliveries.

BACKGROUND

Subsection 6.7.1.2, "Parabolic Trough," briefly describes a parabolic trough system and concludes that the technology was not selected because of its lower efficiency, greater impacts to vegetation, higher storm water impacts, and greater impacts to worker safety. Staff notes that slope conditions at the HHSEGS site may meet the minimum slope requirement for a parabolic trough project; the preliminary geotechnical evaluation for the project states that elevations at the project site are 2,675 to 2,585 feet above mean sea level, and the site slopes gently to the west. Subsection 6.7.1.2 of the AFC generally refers to impacts pertaining to "worker safety, fire protection, and environmental hazards associated with the thermal fluid." No further details are provided. Staff requires additional information to compare the proposed HHSEGS project to an alternative using a parabolic trough technology.

DATA REQUEST

139. Please provide additional information on the technological feasibility of a parabolic trough alternative, including the following:

Applicant's Overview to Responses

Applicant notes that the characteristics of parabolic trough systems are well known to many members of its senior engineering team, which includes numerous senior engineers and managers of Luz International, which commercialized parabolic trough systems in California and built and operated the 354 MW SEGS plants. The decision to move from trough systems to tower systems was fully informed of that prior knowledge and decades-long experience with the older technology.

a. Information and details documenting the conclusion that a parabolic trough system is less efficient than the proposed HHSEGS project. Please expand the discussion of efficiency to address energy conversion, land use, water use, and operating and maintenance costs. Compare the expected efficiencies of the proposed HHSEGS project to an alternative using a parabolic trough technology. Include specific data on the net generating capacity, in megawatts, for a parabolic trough alternative at the proposed HHSEGS project site (i.e., assuming the same project acreage).

Response: Any discussion of a parabolic trough alternative must begin with the fact that substantially less electricity could be produced at the HHSEGS site using the older technology. Using as an example the recently approved Abengoa Mojave Solar Park trough project, it is publicly known that the 250MW project is to be constructed on 1,765 acres and generate 617,000 GWh per year (based on the CPUC advice letter in the case). This corresponds to 349.5 annual GWh/acre. Since a trough system scales linearly with surface area, this average production can presumably be translated to the HHSEGS site which encompasses 3,277 acres, and would thus be capable of producing about 1,146,000 GWh annually from a trough system. However, the HHSEGS site is roughly triangular in shape, and trough plants can only be built in large rectangles. An analysis of the HHSEGS site shows that about 25% of the site

could not be exploited for a reasonable trough alternative, and thus the annual generation would be only about 75 percent of the 1,146,000 GWh, or about 860,000 GWh. Taking as another example the recently approved Genesis Solar Project at Ford Dry Lake, the 250MW project there was listed as requiring 1,800 acres – slightly more than the Abengoa example and therefore the translation to the HHSEGS site would yield only about 825,000 GWh annually.

A conservative figure for the HHSEGS would apply the 32.7 percent capacity factor revealed in the corresponding CPUC advice letter to the 500 MW generating capacity for the HHSEGS, and shows that the Applicant plans to generate approximately 1,432,000 GWh annually from the proposed HHSEGS project, or 67 percent more electricity than a parabolic trough alternative. The corresponding comparison in net generating capacity in MW would be 342 to 357 MW for the parabolic trough examples described above versus 500 MW for Applicant's tower proposal.

With respect to energy conversion, it has been shown (Sargent & Lundy, 2003) that tower systems have higher energy conversion than trough systems. Applicant believes that the advantages of the tower system are larger than those shown in the above reference, with the two largest advantages including parasitic energy (trough systems typically use 10 to 12 percent of energy generated for plant use, including pumping heat transfer fluid through the solar field, while steam tower use is no more than half of that), and steam cycle efficiency (trough, with steam conditions of 734°F and about 1,500 psi would have a cycle efficiency well under 40 percent if using dry cooling), while tower, with steam conditions at 1085°F and about 2,500 psi, would have a cycle efficiency more than 10 percent higher).

Assuming that the parabolic trough alternative used dry cooling, water use would likely be similar. Operations and maintenance costs can be projected to be lower with a power tower because the capital costs are lower than trough technologies.

Reference

Sargent & Lundy LLC Consulting Group. 2003. Assessment of Parabolic Trough and Power Tower Solar Technology Cost and Performance Forecasts (NREL/SR-550-34440), National Renewable Energy Laboratory, *Contract No. DE-AC36-99-GO10337.* October.

b. Information on the feasibility of adding energy storage capabilities to an alternative using a parabolic trough technology.

Response: Please refer to the discussion in DR 138 with respect to PPA limitations and site size limitations, both of which apply to the trough alternative.

c. Details on the potential impacts of a parabolic trough project relating to worker safety, fire protection, and environmental hazards.

Response: Fires relating to the synthetic oil used as heat transfer fluid (HTF) have been documented in both California and Spain. The potential environmental hazards associated with HTF typically require additional investment in preventive equipment, berming, etc., and the potential impact of such hazards has been

documented in various CEC siting cases. Applicant is not aware of any potential impacts on worker safety.

d. In addition to the information requested under item "c," provide information comparing the environmental effects of the proposed HHSEGS project to an alternative using a parabolic trough technology. Discuss in detail how operation of a parabolic trough project could change the level of impacts on environmental resources, including potential impacts on birds, bats, and eagles. Address the magnitude of impacts on visual resources, including a discussion of the difference between a project with and without a solar power tower. Compare impacts relating to glint and glare. Include discussions of how changing the project configuration and operations could affect the level of impacts on other environmental resources, including potential impacts on other sensitive biological species and habitats, water supply and use, air quality, cultural resources, and soils.

Response:

Soils

Implementation of parabolic trough ("PT") technology would require as much as 30% more land than solar power tower ("SPT") technology to generate the same amount of power, and would therefore require a much larger project footprint than the HHSEGS project.

Assuming that the project boundaries remained the same, the HHSEGS site would have to be graded and leveled, and a flood control and stormwater diversion system installed for a PT technology alternative. PT technologies require a site with less than 1 percent slope, and the systems pump collector fluid throughout the field. Grading and leveling the site to the proper slope and the installation of the pipe system needed to circulate the collector fluid would involve greater ground disturbance than that required for HHSEGS. These impacts are only increased when the boundaries for the PT alternative are expanded to accommodate the amount of land that a PT alternative would require to generate the same amount of power as HHSEGS.

Cultural Resources

Given the increased ground disturbance needed for PT technologies (in terms of both on site ground disturbance and the necessary increased project footprint), potential impacts to cultural and paleontological resources would be greater for a PT system.

Air Quality

The large circulatory system of the PT technology requires heavy equipment for construction and operation; therefore, It would also have more operational workforce.

Water Supply and Use

Water use would be greater for PT technology, as there would be a larger number of troughs to clean in order to produce the same amount of power as HHSEGS. If the project boundaries remained unchanged, water use for washing troughs would likely be similar to that expected for HHSEGS; however, less power would be generated relative to the amount of water used. A parabolic trough project that uses water for cooling would require much more groundwater than the air-cooled HHSEGS.

Biological Species and Habitats

Trough technologies would result in greater impacts to biological resources than SPT given that greater areas of habitats are disturbed in order to produce the same amount of power. Potential impacts to birds, bats, and eagles would be similar regardless of whether trough technologies or the power tower technology is used. Bat impacts are not expected since solar facilities do not operate when bats forage, and bats can easily echolocate to avoid stationary structures on site.

Visual Resources

The SPT facility heliostat field will have a similar appearance as the PT collector array. The SPT tower will make the SPT facility more visible.

Glint and Glare

Glint and glare impacts would be small for both PT and SPT technologies. Potential glint and glare impacts of HHSEGS have been described in a previous data request response. PT operations have the potential of glint and glare impacts only if the operator does not properly orient the troughs when out of operation.

Applicant has shown at the Ivanpah site that as much as 66 percent of a tower project site can be left undisturbed, minimizing impacts on biological species, water resources and soil, among others. A trough technology alternative would require a complete grading of the entire site and removal of all vegetation. It would not be possible to retain the general topography of the site including slope, washes, stormwater runoff, etc.

e. Information on the extent to which a project using a parabolic trough technology, with and without storage, would satisfy the stated project objectives compared to the proposed HHSEGS project.

Response: A parabolic trough alternative would generate substantially less electricity and at a higher unit energy cost, and as such would not satisfy the stated project objectives compared to the proposed HHSEGS project. Applicant does not believe that such a parabolic trough alternative can be financed commercially. Further, the complete grading and vegetation removal necessitated by trough technology would not meet Applicant's standards for environmental stewardship.

BACKGROUND

Subsection 6.7.1.3, "Solar Photovoltaic," briefly describes the solar photovoltaic (PV) power plant system and concludes that the technology was not selected because of its "inherent

technical limitations, chiefly, intermittency, which at the desired scale poses significant challenges to grid system stability." Staff requires additional information to compare the proposed HHSEGS project to an alternative using PV technology.

DATA REQUEST

140. Please provide additional information on the technological feasibility of a PV alternative, including the following:

Applicant's Overview to Responses

Section 15126.6 of Title 14 of the California Code of Regulations describes in detail the information that must be considered in identifying alternatives to a project:

> An EIR shall describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives. An EIR need not consider every conceivable alternative to a project. Rather it must consider a reasonable range of potentially feasible alternatives that will foster informed decisionmaking and public participation. An EIR is not required to consider alternatives which are infeasible (Emphasis added).

Thus, CEQA requires the consideration of a reasonable range of alternatives to the project that would feasibly obtain most of the basic project objectives, but also avoid or substantially lessen any significant effects of the project. Furthermore, CEQA provides that alternatives that (1) are infeasible; (2) fail to avoid or substantially lessen any of the significant effects of the project; or (3) fail to meet most of the basic project objectives are not within the range of reasonable alternatives and may be eliminated from detailed consideration.

With respect to alternatives to the project or to the project's location, a CEQA-compliant alternative must look at a site-specific PV project – not some unspecified, generic PV site. To date, Applicant is unaware of any specific site being identified. Accordingly, this response focuses on alternative technologies, not an alternative project location.

For an alternative to be within the range of reasonable alternatives, the alternative must avoid or substantially lessen a significant effect of the project. Specifically, Section 15126.6(f)(2)(A) of the CEQA Guidelines offers the following "key question" regarding alternative site locations:

> Key Question. The key question and first step in analysis is whether any of the significant effects of the project would be avoided or substantially lessened by putting the project in another location. Only locations that would avoid or substantially lessen any of the significant effects of the project need be considered for inclusion in the EIR (Emphasis added).

CEQA requires that the Commission consider only those alternatives that avoid or substantially lessen significant environmental effects. Most of Staff's areas of inquiry are directly related to the HHSEGS project footprint, not the technology. Substituting PV technology for the Solar Power Tower (SPT) technology, would likely require a larger footprint to be able to generate the same amount of gigawatt hours (GWh) of electricity as

HHSEGS will on its footprint. In fact, the vast majority of the utility-scale PV projects proposed for similar desert sites have many of the same environmental impacts and potentially the same, or even larger, project footprints.

f. Information on how the location of a PV project relative to load centers alters the effect of intermittency on the system.

Response: Intermittency and variability of PV plants, especially those that use fixed-axis technologies that cannot track the sun over a course of the day, brings into their question their suitability for large-scale generation. Solar thermal power plants in general enjoy substantial operational benefits. HHSEGS's SPT design in particular has the ability to increase or decrease the number of heliostat focusing on the receiver to account for variability in time of day and season. HHSEGS can decrease or "turning down" excess mirrors when available thermal energy is greater than can be absorbed by the receiver system and converted to electricity by the turbine. Similarly, toward the end of the day or, during times of less solarity in winter months, HHSEGS can increase the number of heliostats focused on the receiver to increase production and extend the generating day. These capabilities have the effect of reducing the variability of output of the HHSEGS tower technology. For example, each unit in the proposed HHSEGS project will generate at its maximum rating for at least 40 percent of all sunlit hours despite the fact that insolation will be quite variable during those hours – while a corresponding PV plant will be highly variable at all times.

g. Data on the net generating capacity, in megawatts, for a PV alternative at the proposed HHSEGS project site (i.e., assuming the same project acreage).

Response: The largest PV plant in the United States is the Sempra Copper Mountain project in Boulder City, Nevada, which is delivering electricity under a PPA to PG&E. This project is listed by CPUC at 48 MW capacity. The largest in California (and the 3rd largest in the country) is NRG's 21 MW Blythe PV project delivering electricity to SCE. (In contrast, solar thermal units of at least 80 MW each have been operating since the 1980s.)

Further, the extreme intermittency and variability of PV plants brings into their question their suitability for large-scale generation. Solar thermal power plants in general, and Applicant's SPT design in particular, use 'dumping' of energy in the solar field (turning down excess mirrors) when available thermal energy is greater than can be absorbed by the receiver system (and, optionally, storage system) or converted by the turbine. This has the effect of reducing the variability of output on high-insolation days; for example, each unit in the proposed HHSEGS project will generate at its maximum rating for at least 40 percent of all sunlit hours despite the fact that insolation will be quite variable during those hours – while a corresponding PV plant will be highly variable at all times.

Using the two examples above of "large" PV systems (and publicly available data), the Blythe system has a 21 MW capacity on 200 acres, while Copper Mountain is 48 MW on 350 acres. Translated to the 3,277 acres of the HHSEGS site, this yields a wide range of 344 MW to 450 MW, the latter figure being based on Blythe. Even at the upper end of the range, this is 10 percent less capacity than the proposed

HHSEGS project. Comparing electricity generation, CPUC figures show 100,000 GWh annually (23.8 percent capacity factor) for Copper Mountain and 50,000 GWh (27.2 percent capacity factor) for Blythe. Applying the more encouraging Blythe figures to HHSEGS would yield about 1,071,000 GWh at the HHSEGS site, some 25.2 percent less than the proposed project.

It is important to note that both of these plants use CdTe thin-film PV modules, a relatively new technology compared to the older, more established crystalline silicon technology. While there is as yet insufficient data on long-term performance degradation of CdTe cells in desert conditions, all PV cells are known to generate less electricity in elevated temperatures such as summer afternoons, and all PV cells are known to experience a gradual yet steady degradation of performance over their lifespans.

h. Information on the costs and benefits of incorporating energy storage into a PV project, to improve the project's dispatchability and address intermittency.

Response: Flywheel and other mechanical storage technologies would require the powering of a mechanical source, which would only be possible during those times when the PV field is generating electricity, resulting in substantial parasitic losses during the time generation is feasible. Battery storage is undergoing serious study, but to date has proven to be too expensive and unable to "scale up" to utility-scale projects to consider feasible. Thermal storage is unavailable to PV technologies since by design they create no useful thermal energy. Given these constrains, intermittency and lack of dispatchability issues remain for PV technology.

i. Information comparing the environmental effects of the proposed HHSEGS project to a PV alternative. Provide details on differences in required water usage for the two technologies. Discuss in detail how operation of a PV project could change the level of impacts on other resources, including potential impacts on birds, bats, and eagles. Address the magnitude of impacts on visual resources for projects with and without a solar power tower. Compare impacts relating to glint and glare, including the impacts of heliostats compared to PV panels. Include discussions of how changing the project configuration and operations could affect the level of impacts on other environmental resources, including potential impacts on other sensitive biological species and habitats, air quality, cultural resources, and soils.

Response: As noted above, most of Staff's areas of inquiry are directly related to the HHSEGS project footprint, not the technology. Substituting a PV technology for the SPT technology, would likely require a larger footprint to be able to generate the same amount of GWh of electricity as HHSEGS. Thus, for those disciplines where impacts are substantially related to the project footprint (such as terrestrial biology, botany, and cultural resources), a PV project would not avoid or minimize potentially significant effects. Similarly, for most subject matters related to project construction and operations (such as worker safety, transmission system line safety and nuisance) the potential effects of a PV project are substantially similar to those of a SPT project, and thus a PV facility would not avoid or minimize potential impacts in those disciplines.

Water Use

Water use would be less since steam cycle make up is not required. PV panels and heliostats both require washing especially in a dusty desert environment, but PV panels may not need to be washed as often.

Bird, Bat and Eagles

Impact to these species would likely be less at a PV facility. The only potential impacts to birds, bats and eagles from a PV project would be from collisions either with the panels or with the transmission lines. Bat impacts are not expected since neither HHSEGS nor PV facilities operate when bats forage, and bats can easily echolocate the stationary structures of the facility.

Visual Resources, Glint and Glare

A PV facility would not have the 750-foot-tall SPTs. The height of the PV panels would depend on how they are mounted, but they could be of comparable height to the heliostats. However, the PV panels are designed to absorb sunlight and use anti-reflective glass. Due to the limited rotation angles of solar PV panels that track the sun, they can be oriented to have no potential for reflecting the sun's rays upon ground-based observers.

Sensitive Biological Species and Habitats, Air Quality, Cultural Resources, and Soils

Implementation of PV technology could require more land area than SPT technology for the same MW output. Projects using either technology would have a perimeter desert tortoise/security fence that would keep tortoise and other wildlife out. PV panels can be developed on top of a framework set 4 to 5 feet above the ground surface so that impacts to the land (soil and stormwater) would be similar to SPT technology. However, because of the larger land area disturbed with PV, cultural and paleontological impacts would have the potential to be greater at a PV facility. Operations of a PV facility would have no air quality emissions. PV panels use smaller and less-complicated mechanical equipment for operation; consequently, PV facilities would use less heavy equipment for construction. Therefore, air emissions from construction equipment is likely to be lower for PV facilities. Fugitive dust emissions would be less for a PV facility, since panel washing occurs less frequently. Also, since construction of a PV facility is less complex, it would have less workforce (i.e., provide less jobs) and less traffic impacts. It would also have significantly less operational workforce (almost none) and less economic benefit to the county and state.

From a CEQA alternatives perspective, the HHSEGS impacts are being mitigated to less than significant, so a PV project would not avoid significant effects because none exist. In addition, there are power quality and variability issues, as described previously in subparts a and b, that need to be considered.

j. Information on the extent to which a PV project would satisfy the stated project objectives compared to the proposed HHSEGS project.

Response: Section 15126.6 of Title 14 of the California Code of Regulations requires, in part, that an alternative to the project or the project's location that can "…feasibly attain

most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project…."

CEQA further defines "feasibility," in part as follows: "'Feasible' means capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors." (Public Resources Code §21061.1; 14 CCR §15364.)

A PV alternative would be infeasible, as discussed below, in meeting the project's basic objectives. Similarly, CEQA requires that alternatives satisfy "most of the basic objectives of the project." Again, a PV alterative fails this test.

The Applicant's project objectives are described in more detail in the body of the AFC. (See, for example, Section 1.3 of the AFC.) Some of the basic project objectives that are not satisfied by a generic PV alterative are the following:

- A PV project could not comply with provisions of power sales agreements to develop a net 500 MW solar generating facility that can interconnect to the CAISO Balancing Authority with the potential of achieving a commercial on-line date as soon as possible, targeted for the first/second quarter of 2015. A generic PV alternative could not meet this central project objective. Failure to satisfy this contractual obligation means that such an alternative is infeasible taking into account economic factors and it could not be accomplished successfully in a reasonable time period, given the long-lead time for the utility RFO process and CPUC contract approval.
- A generic PV alternative would fail to meet the objective of securing site control within a reasonable timeframe and a reasonable effort. To date, no project-specific PV alternative site has been identified.
- Using PV technology at the HHSEGS site would require substantial lead time to develop a project based on a wholly new technology.
- There would also remain a non-CEC permitting process that could not be initiated in a timely-manner.
- A significant project objective is to use BrightSource's proprietary technology in another utility-scale project, further proving the technical and economic viability of the technology. A PV project fails to attain this basic objective. It may also be infeasible, since it could not be accomplished in a reasonable time frame, given the lead time to negotiate for the use of another proprietary technology and the follow-on development process.
- There is also some question, given the long lead times associated with initiating a new CAISO Interconnection request, as to whether a PV project could provide renewable power capable of providing grid support by offering power generation that is flexible and delivered to the grid operator through communications with a scheduling coordinator.
- Finally, as noted above, the Applicant has substantial questions as to whether a PV project could be developed that would generate a net 500 MWs and be capable of selling competitively priced renewable energy,

consistent with the procurement obligations of California's publicly owned and privately owned utilities. PV has yet to scale to this level and the economics are both uncertain and outside the business model for a company developing a proprietary solar thermal technology. Electricity generation would be at least 25 percent less than the proposed HHSEGS project, and therefore, a hypothetical PV project would fall short of the stated project objectives. In addition, the technological risks, including performance degradation and reduced high-temperature performance, as well as commercial viability, would have to be considered.

Soil & Water Resources (141-143)

BACKGROUND

As stated in the HHSEGS AFC, Appendix 5.15: Water Resources, Hidden Hills Interim Assessment Report, dated May 2011, "Limited aquifer hydraulic testing has been conducted in the vicinity of the project site" (Cardno Entrix, 2011). The report cites two aquifer tests that yield very little useful information.

The first test is from 1966, when water levels were likely about 45 feet higher than today (see USGS well USGS 360359115573201 162 S22 E53 01DA 1). The exact location of the well was not included in the report. The reported pump rate was 275 gallons per minute (gpm).

The second pump test was conducted at a well in the direct vicinity of the proposed project in 2003, but only lasted 22 hours because of declining water levels. The reported transmissivity was significantly lower than the 1966 test, 7,225 gallons per day per foot (gpd/ft) versus 4,675 gpd/ft. No pump rate was reported from the 2003 test.

The applicant also indicates another pump test should be conducted and states, "The proposed aquifer testing will aid in determining aquifer barrier boundaries such as faults within the aquifer that can limit the expansion of the cone of depression and correspondingly increase drawdown" (Cardno Entrix, 2011). Staff agrees with the applicant, an aquifer test should be performed to evaluate whether a reliable supply of water can be produced for project construction and operation and to better characterize aquifer parameters for local drawdown impact analysis.

DATA REQUEST

141. Please provide the results of a pump test of sufficient duration and flow to demonstrate that the aquifer can provide a reliable supply for project construction and operation. The pump test should also provide sufficient data to evaluate whether any barriers to flow exist.

Response: Applicant submitted a request for additional time to respond to this data request on January 30, 2012. Completion of the pump test and preparation of a report summarizing the data are anticipated by February 29, 2012.

BACKGROUND

The AFC states, "For existing domestic well pumpers in the vicinity of the project who agree to pre-operational groundwater monitoring, the Applicant will implement a retrofit program (e.g., lowering the pump intakes, deepening the wells, or building new wells) if the monitored well experiences lowered groundwater levels such that production rates decrease and pumping costs increase." (HHSEGS, 2011).

Staff has no assurance that the proposed mitigation is viable. Staff has a record of local wells drilled beyond the typical 300 to 400 foot depth that yield no water. Staff also has records of local wells in the area about 300 feet deep that only yield 5 gpm. These data suggest the proposed mitigation of deepening and retrofitting wells may not be viable. If the proposed mitigation is not viable, the applicant must provide alternatives.

DATA REQUEST

142. Please provide information sufficient to demonstrate the proposed well rehabilitation mitigation strategy is viable.

Response: A total of eight logs of private wells from the Charleston View area and two logs of wells from the Hidden Hills site were provided by CEC. It is likely that logs for the other wells in Charleston View were never filed or are not available to the state. Details of the well location and construction are confidential under California law and cannot be reported in specific detail. However, the general characteristics of the well construction are assumed to be typical for the majority of wells in Charleston View. The data from these logs was reviewed to determine if it was feasible to mitigate potential impacts from the Hidden Hills Solar Electric Generating System project by modifying or replacing existing private wells. Additionally, a field evaluation was conducted to assess the construction, condition, and productive capacity of the six existing wells on the project site

The collected data show that the wells completed on the project site range from 93 feet to over 1,100 feet deep. Reports indicate that wells on site have been pumped as high as 400 gpm. Two of the wells on the project site, Well 3 and the Orchard Well were test pumped recently and appear to have sufficient production capacities to provide the water required for the project. The capacity of these wells will be confirmed by an extended constant rate pumping test to be conducted in February 2012. Four of the onsite wells are shallow, approximately 93 to 150 feet deep. Two of these wells are dry and the two slightly deeper wells have between 13 and 30 feet of water in the bottom of the wells. The data from the onsite wells indicates that permeable aquifer material is present to at least 1,000 feet below land surface in the area.

The private wells in Charleston View for which the Applicant has construction data range from 175 to 310 feet in depth. The wells were tested at rates between 5 and 30 gpm with specific capacity values reported at 3.5 to 12.5 gpm/ft. Static water levels were reported at between 60 and 156 feet at the time of drilling (1992 to 2006). Water level monitoring data provided by Nye County indicates that water levels west of the state line in the Orchard Well and Quail Well, both on the project site along Tecopa Road (old Spanish Trail Highway), have varied by only 2.5 feet over the last 8 years. This data suggests that the aquifer is relatively stable and has sufficient capacity to support domestic water needs in the area.

The available well data indicates that the aquifer is currently capable of supporting the domestic water needs of the area. The new pumping at the project site is expected to produce additional drawdown of 5 to 8 feet or less, which is not likely to cause a measurable loss in production or significant increase in pumping costs for private wells in the area. The field data show that if remediation of existing offsite wells were required, it would be possible to deepen a pump setting, stimulate a poorly producing well, or drill a deeper replacement well. These methods are all feasible ways to restore the capacity of any well impacted by the project.

DATA REQUEST

143. Please provide an alternative mitigation strategy for impacts to local wells, if no additional information can be provided to demonstrate the proposed well rehabilitation mitigation strategy is viable.

Response: For the reasons described in DR 142, the well rehabilitation mitigation strategy is viable. Therefore, it is not necessary to develop an alternative mitigation strategy for impacts to local wells.

Figures

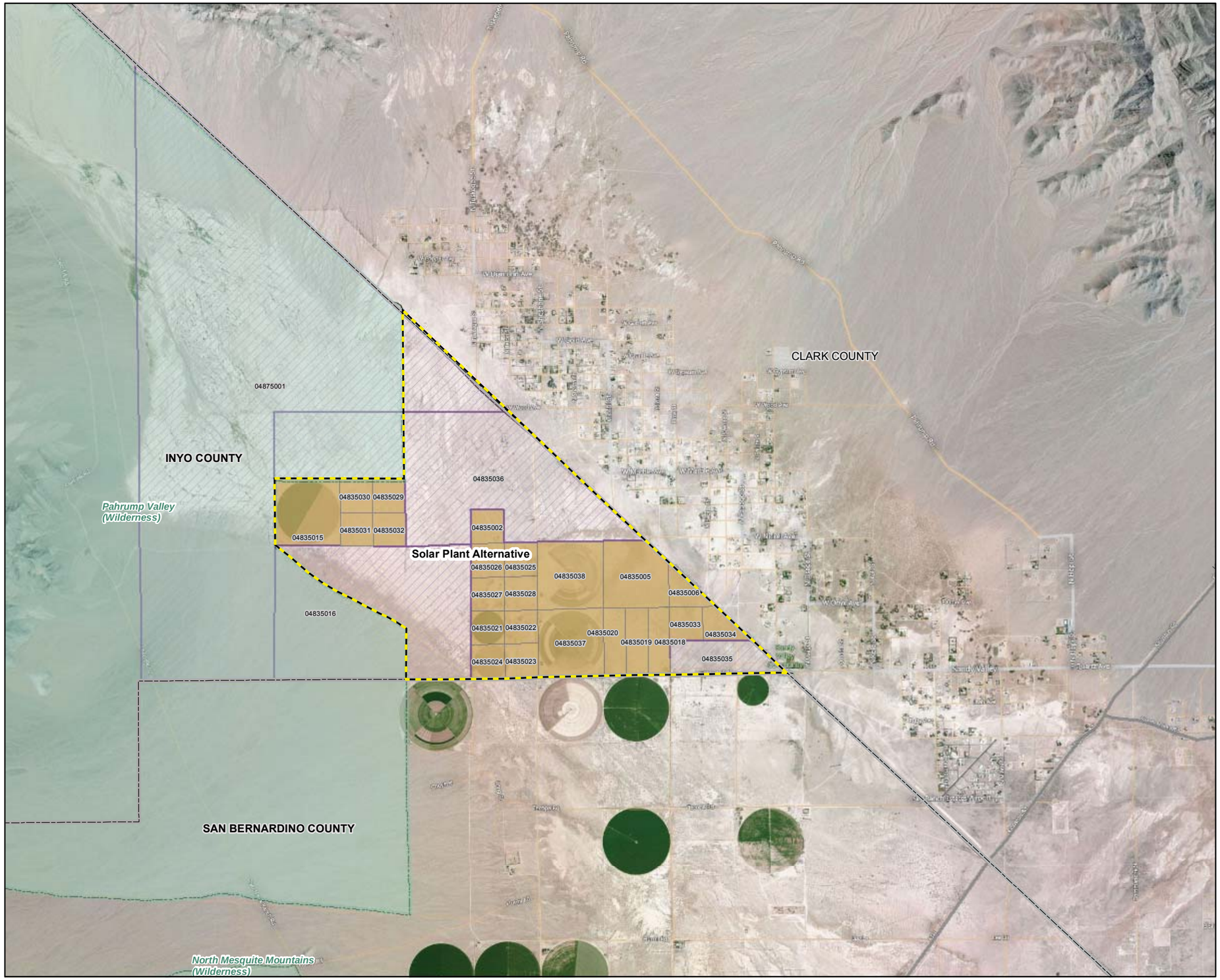
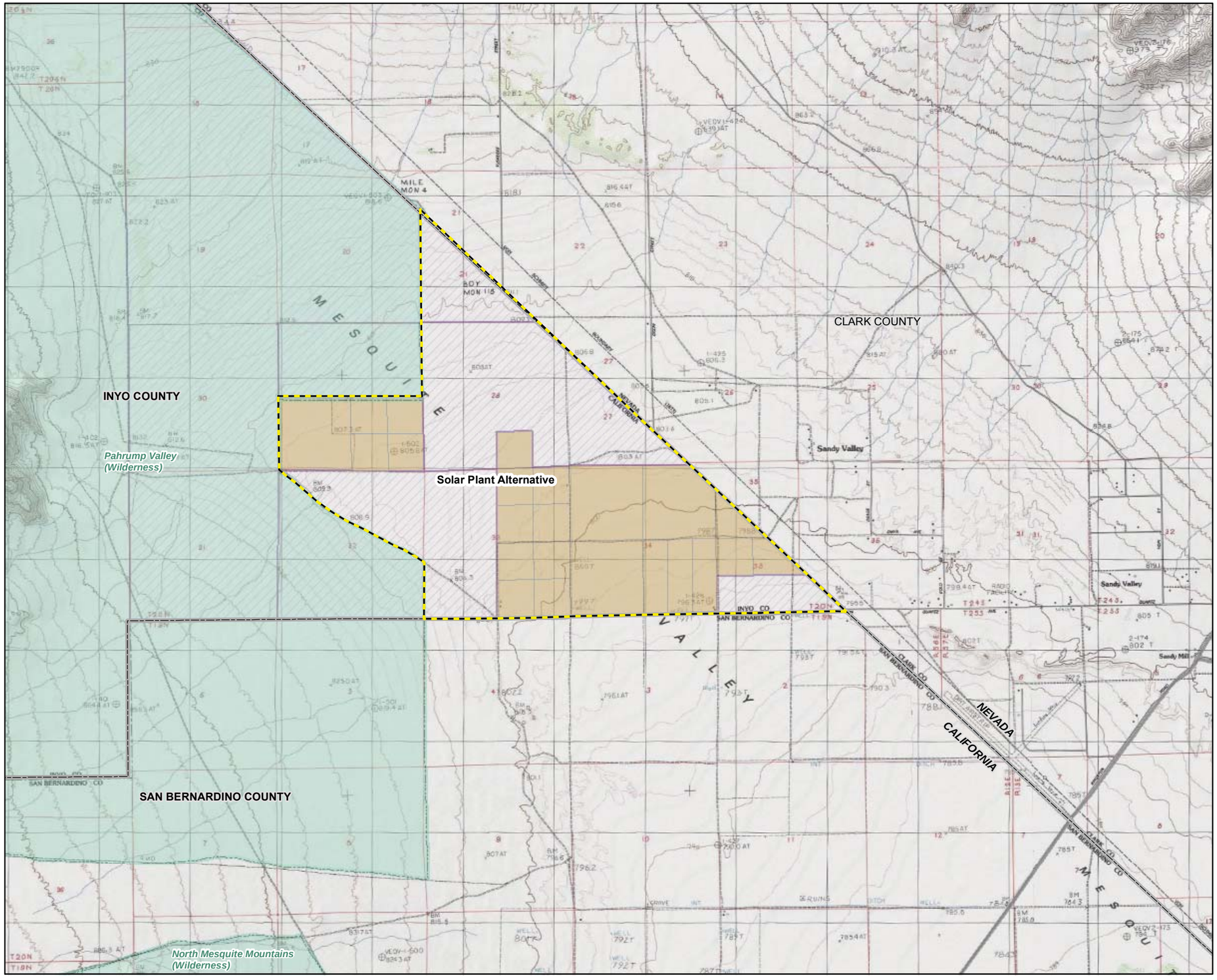


FIGURE DR137-1
Potential Solar Plant Alternative and Parcels for Inyo County
Solar Plant Alternative Site, Inyo County
Hidden Hills Solar Electric Generating System



LEGEND

Roads and Trails

- Interstate
- Highway
- Major Road
- Solar Plant Alternative (3,119 acres)

Land Use Type*

- Private Land
- Government Land
- Wilderness Areas

N

0 1,800 3,600

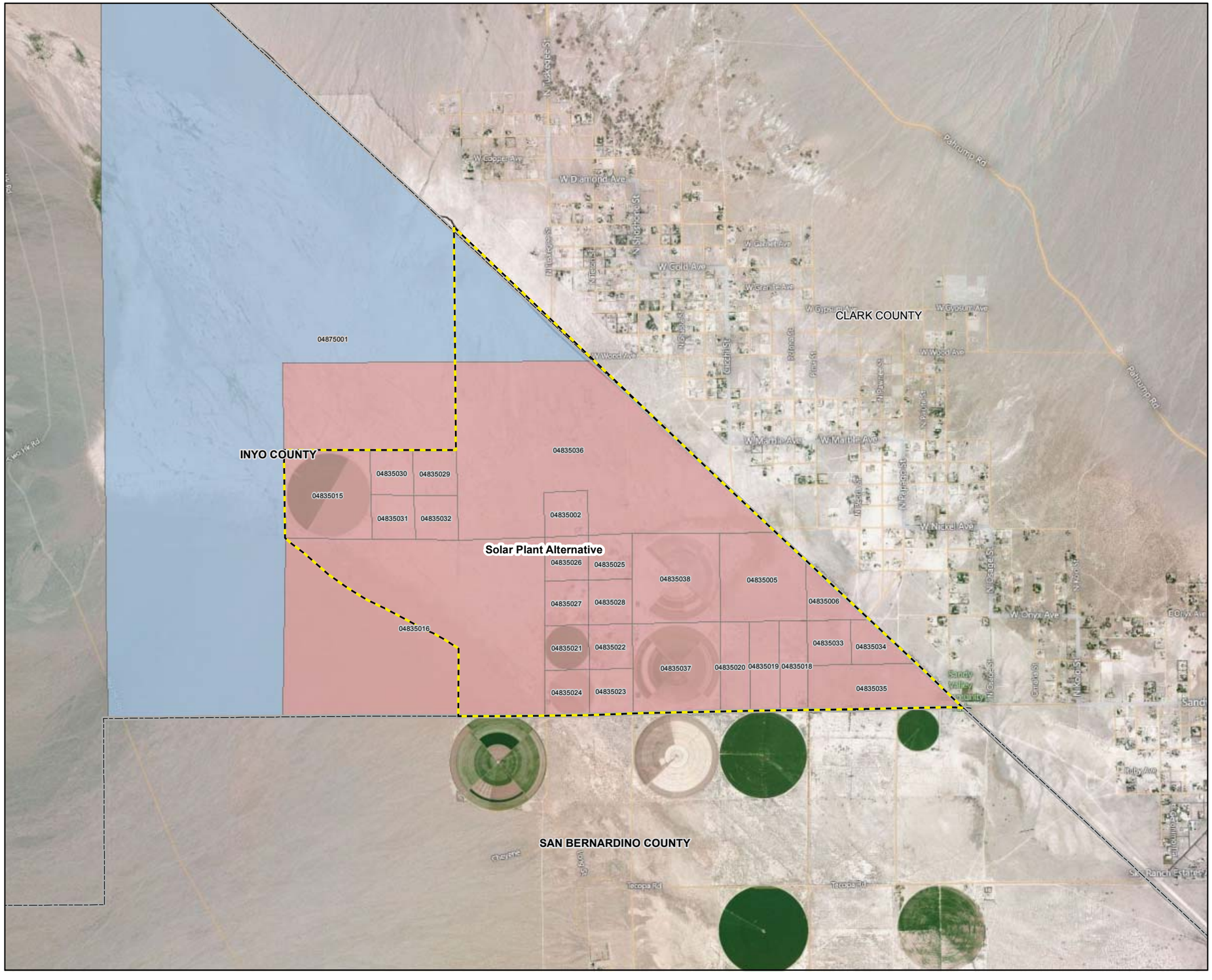
Feet

FIGURE DR137-2

Potential Solar Plant Alternative, Parcels for Inyo County and Elevation Reference

Solar Plant Alternative Site, Inyo County

Hidden Hills Solar Electric Generating System



LEGEND

Solar Plant Alternative (3,119 acres)

Zoning, General Plan

OS-40, A

OS-40, SFL

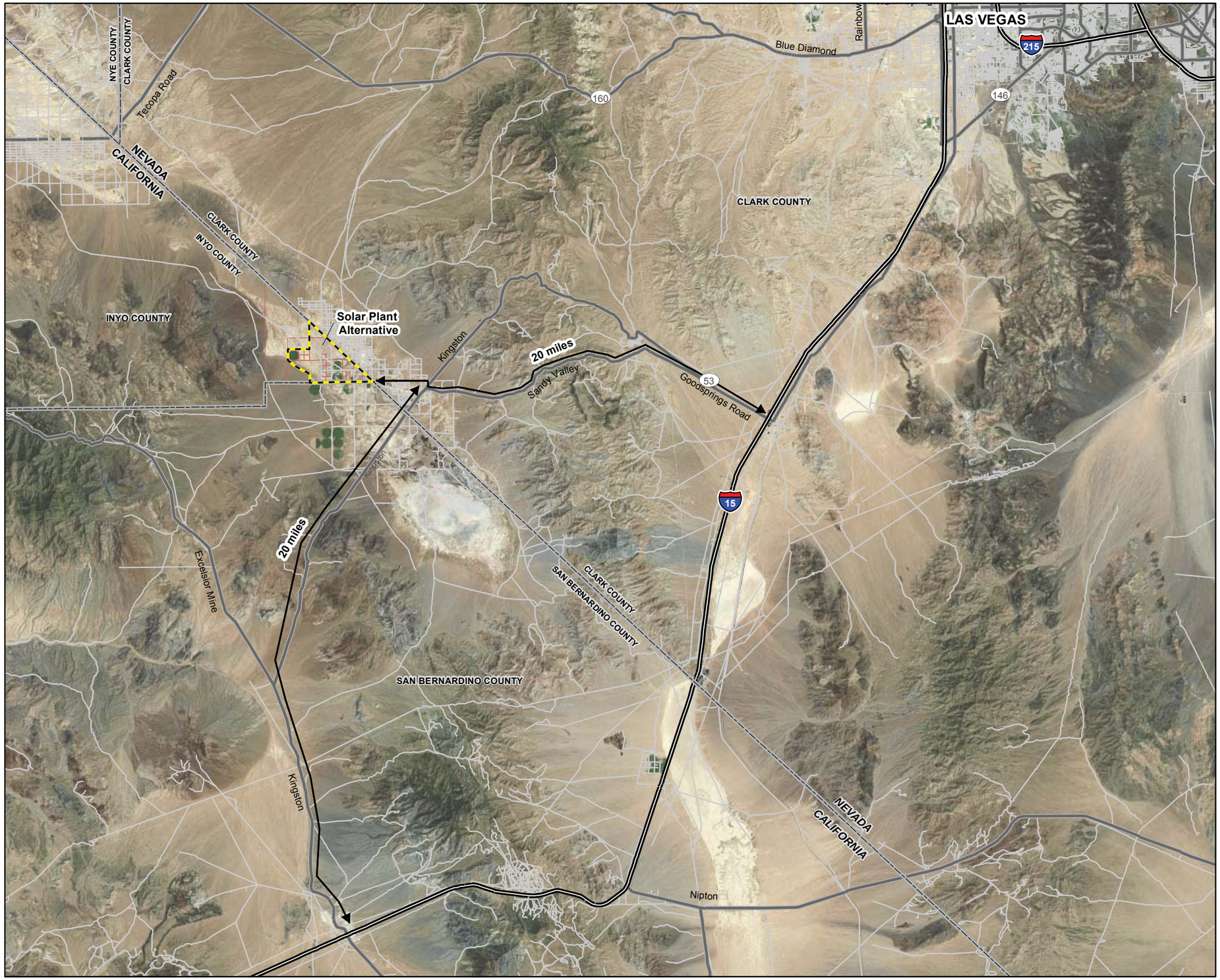
Zoning:
OS-40 = Open Space, 40-acre minimum

General Plan:
A = Agricultural
SFL = State and Federal Lans

N

0 1,500 3,000
Feet

FIGURE DR137-3
General Plan and Zoning for Inyo County
Solar Plant Alternative Site, Inyo County
Hidden Hills Solar Electric Generating System



LEGEND

Roads and Trails

- Interstate
- Highway
- Major Road
- Local Road
- Solar Plant Alternative (3,119 acres)

Access Routes to Site:

From North: 20 miles
I-15 to Goodpsrings Rd/Sandy Valley Road

From South: 20 miles
I-15 to Kingston/ Excelsior Mine Road

NOTE:
Distances should be considered approximate

N

0 2.5 5
Miles

FIGURE DR137-4
Roads and Access Routes for Potential Solar Plant Alternative
Solar Plant Alternative Site, Inyo County
Hidden Hills Solar Electric Generating System

LEGEND

- Substation
- Proposed VEA 500kv Transmission Line

Possible Transmission Line Routes

- Alternative Route #1
- Alternative Route #2
- Alternative Route #3

Roads and Trails

- Interstate
- Highway
- Major Road
- Local Road
- Solar Plant Alternative (3,119 acres)

Total Distances of Alternatove Routes:

Alternative Route #1 to Eldorado Substation: 43 miles
Alternative Route #2 to Mt. Pass Substation: 50 miles
Alternative Route #3 to Mt. Pass Substation: 42 miles

NOTE:
Distances should be considered approximate

N

0 1.5 3
Miles

FIGURE DR137-5
Potential Transmission Line Routes
Solar Plant Alternative Site, Inyo County
Hidden Hills Solar Electric Generating System

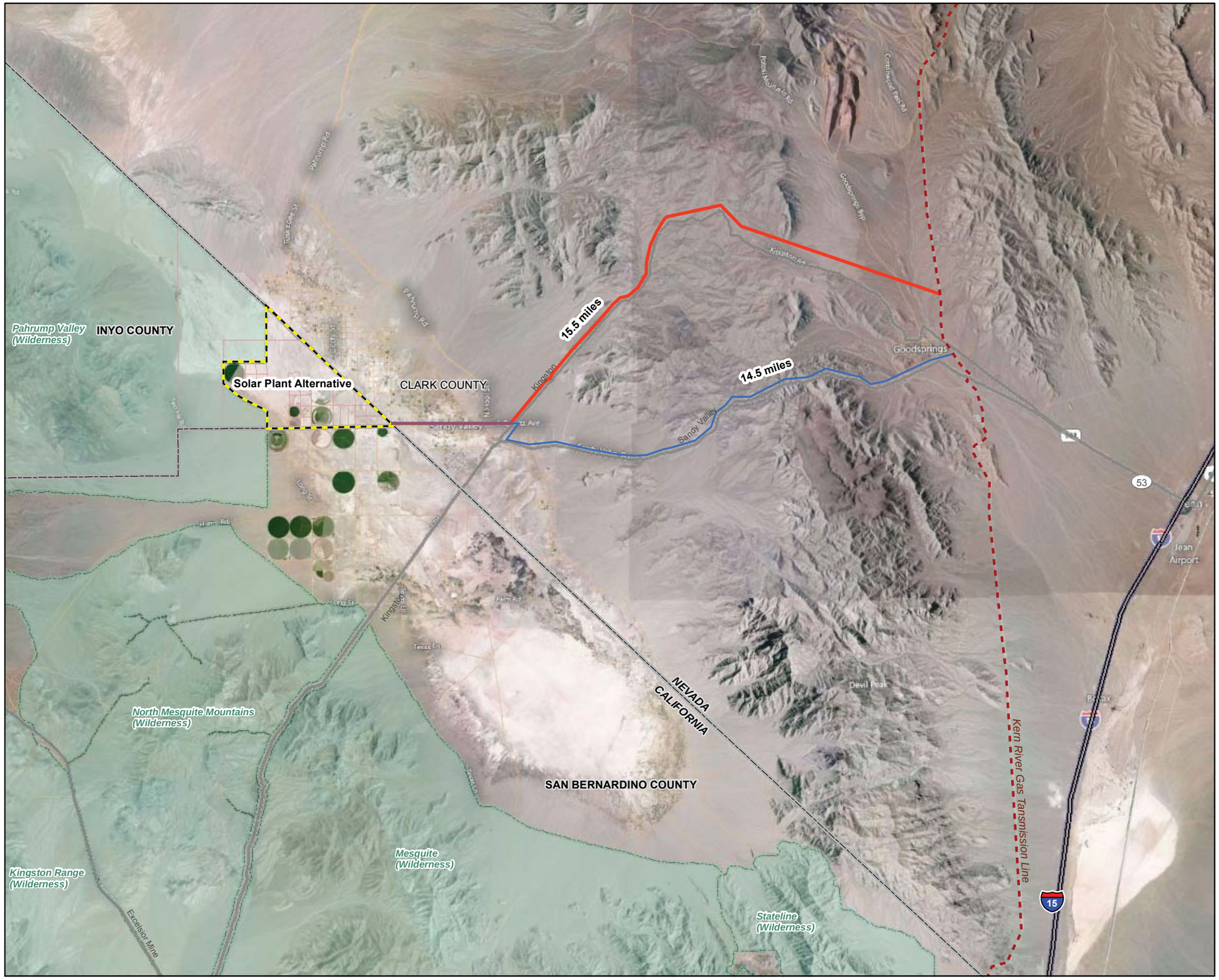


FIGURE DR137-6
Kern River Gas Transmission Line and Possible Gasline Alternative Routes
Solar Plant Alternative Site, Inyo County
Hidden Hills Solar Electric Generating System

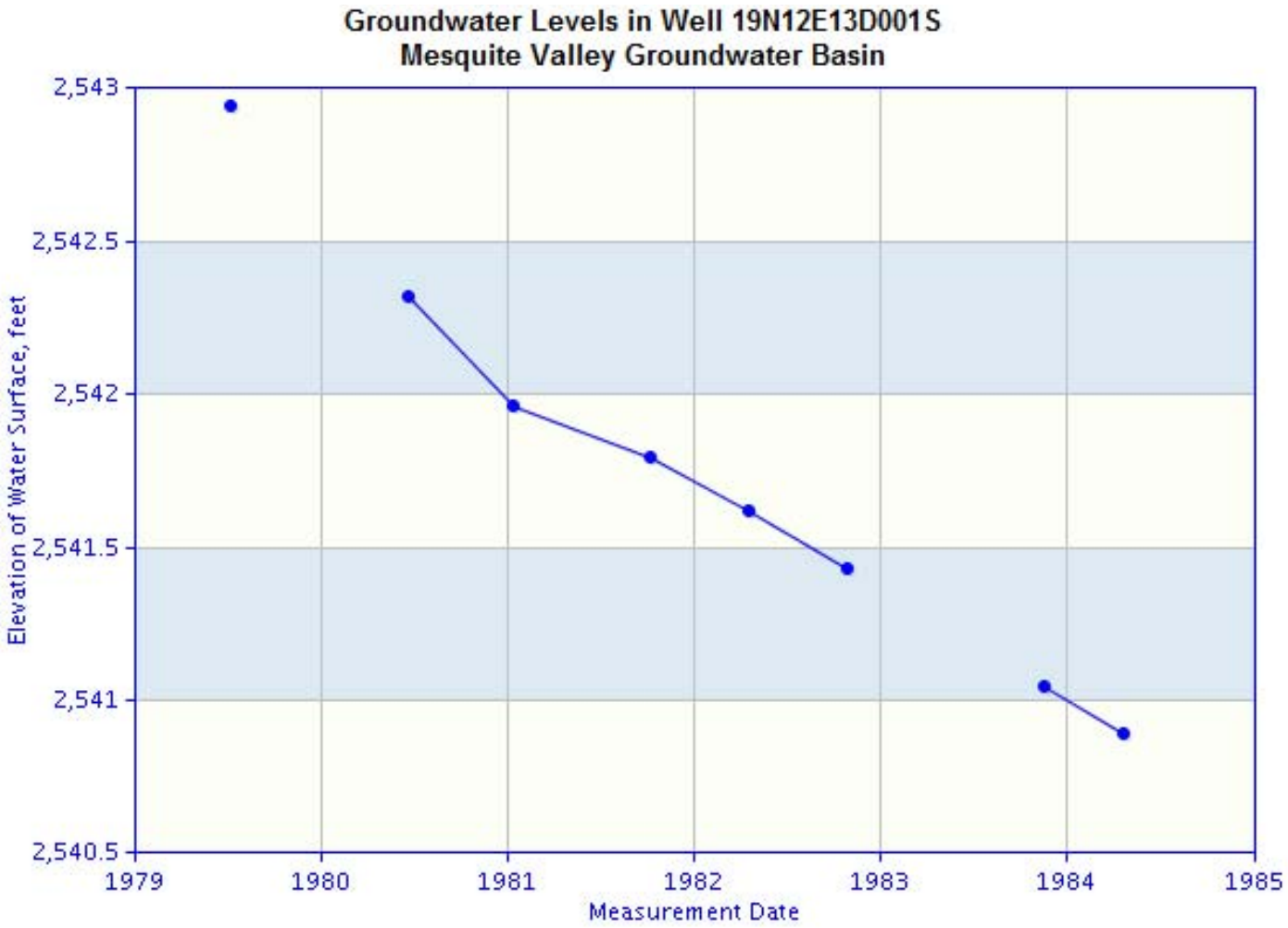
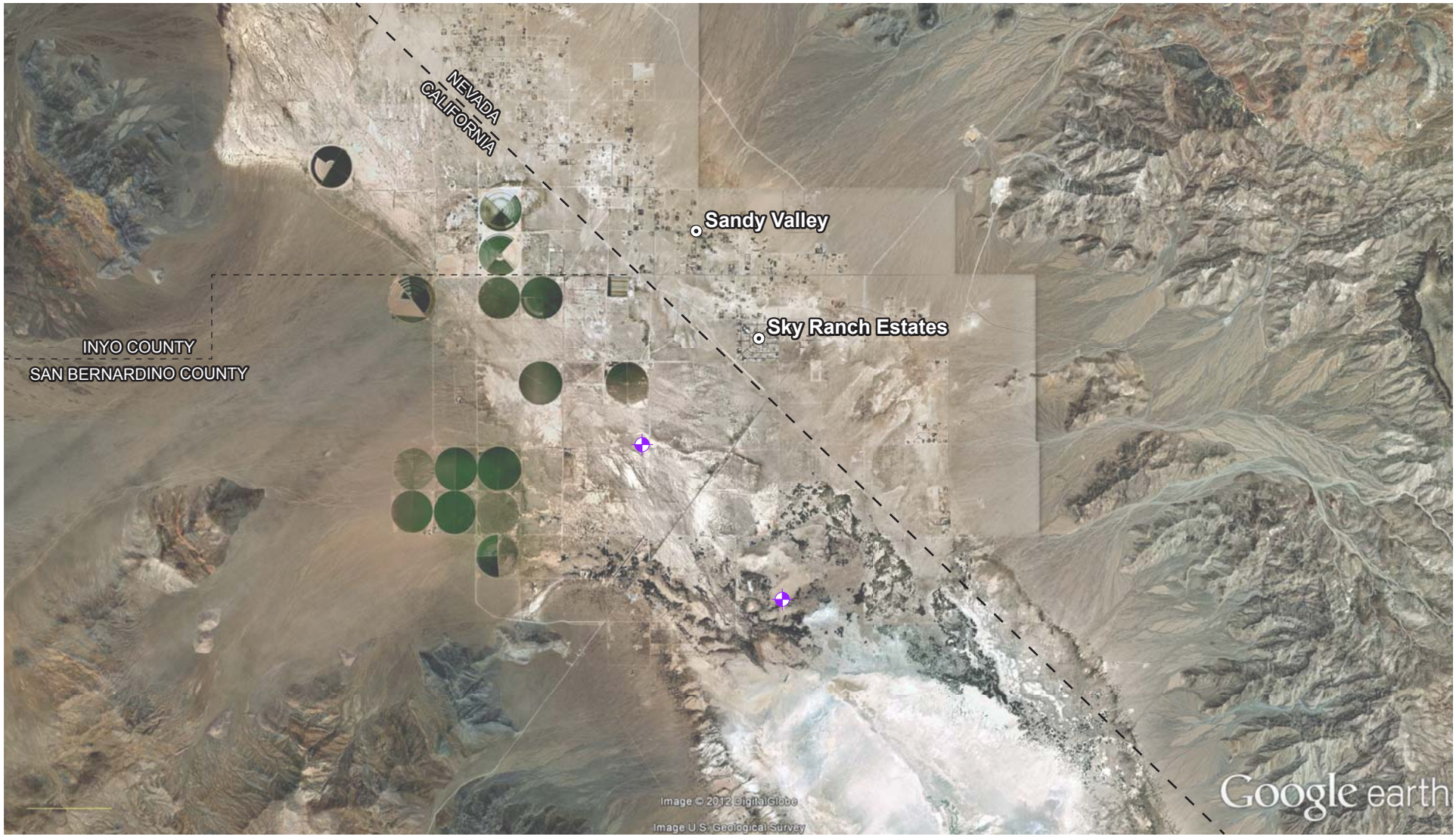


FIGURE DR137-7
Groundwater Level Decline in Vicinity of Solar Plant Alternative
Solar Plant Alternative Site, Inyo County
Hidden Hills Solar Electric Generating System



LEGEND

Groundwater Monitoring Well

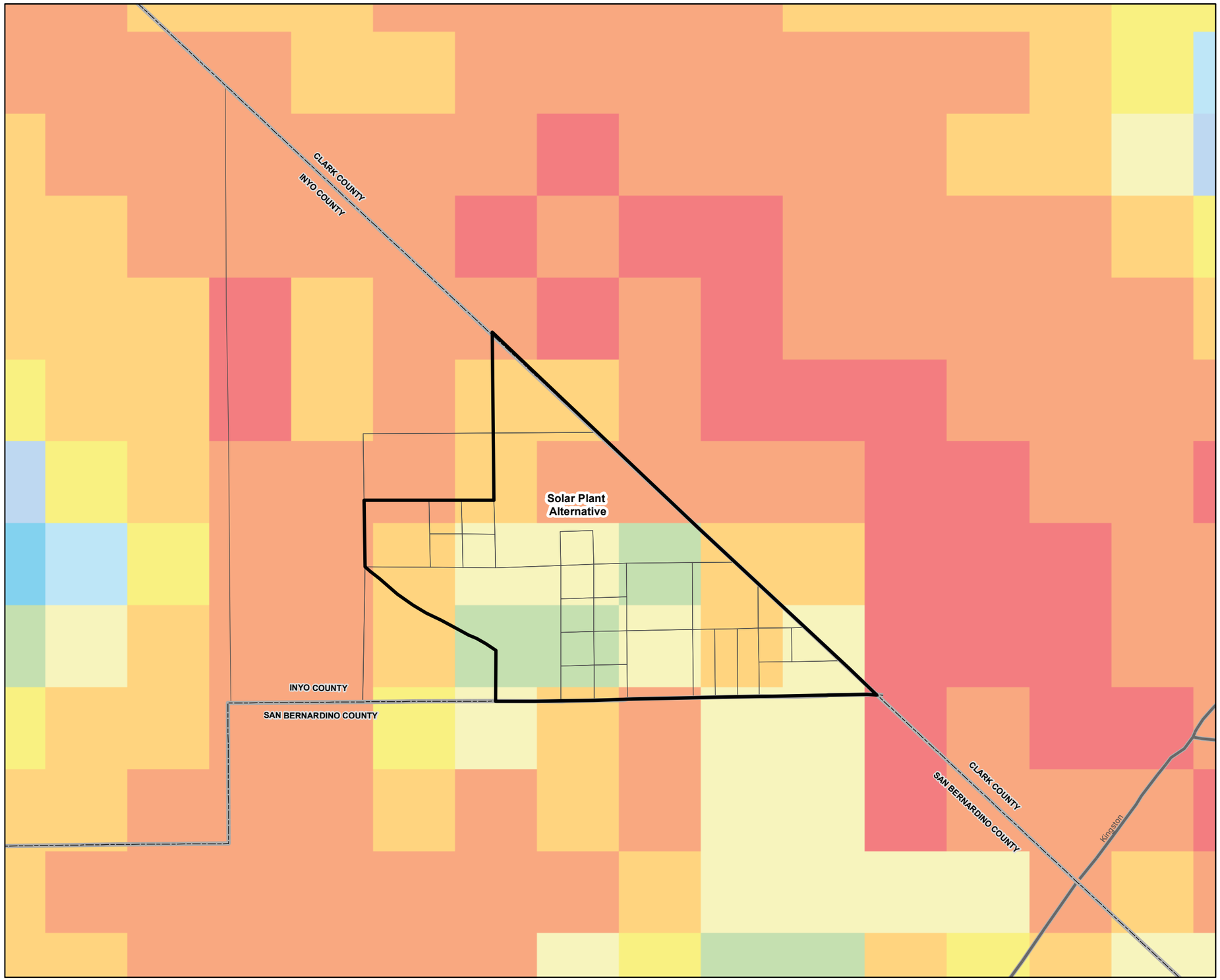
North

0 1 2

Approximate scale in feet

Source: Department of Water Data Library

FIGURE DR137-8
Groundwater Monitoring Wells in Proposed Alternative Site Vicinity
Solar Plant Alternative Site, Inyo County
Hidden Hills Solar Electric Generating System



LEGEND

Roads and Trails

- Interstate
- Highway
- Major Road
- Solar Plant Alternative (3,119 acres)

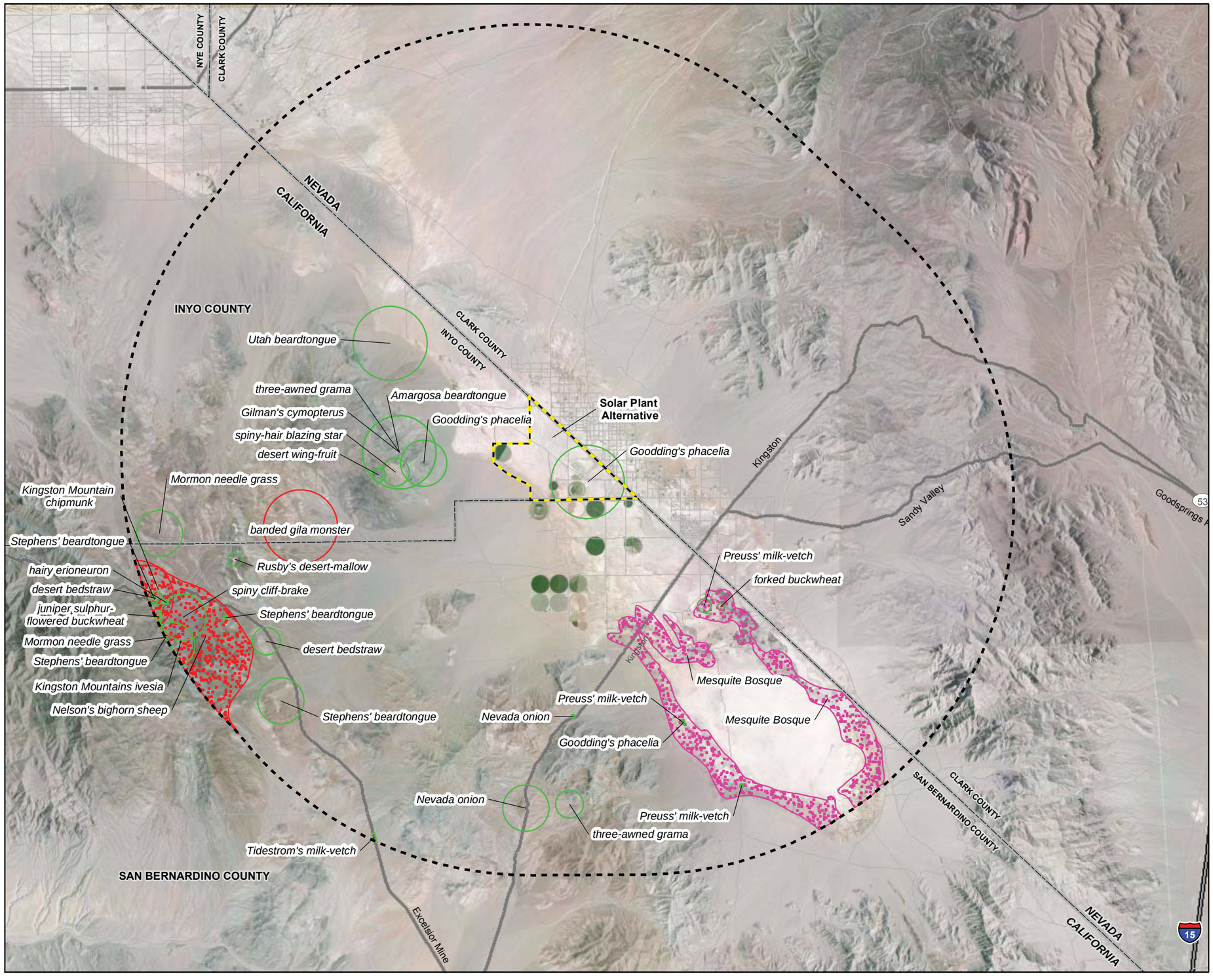
Tortoise Habitat Potential

- 0
- 0.1
- 0.2
- 0.3
- 0.4
- 0.5
- 0.6
- 0.7
- 0.8
- 0.9
- 1

N

0 2,000 4,000
Feet

FIGURE DR137-9
USGS Tortoise Habitat Model
Solar Plant Alternative Site, Inyo County
Hidden Hills Solar Electric Generating System



LEGEND

Roads and Trails

- Interstate
- Highway
- Major Road
- Local Road
- Solar Plant Alternative (3,119 acres)
- Buffer of Solar Plant Alternative (10 miles)

CNDDB Results

- Plant (80m)
- Plant (specific)
- Plant (non-specific)
- Plant (circular)
- Animal (80m)
- Animal (specific)
- Animal (non-specific)
- Animal (circular)
- Terr. Comm. (80)
- Terr. Comm. (specific)
- Terr. Comm. (non-specific)
- Terr. Comm. (circular)

CNDDB Data, January 2012

N

0 1 2
Miles

FIGURE DR137-10
CNDDB Results within 10 miles of Potential Solar Plant Alternative
Solar Plant Alternative Site, Inyo County
Hidden Hills Solar Electric Generating System

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT
COMMISSION OF THE STATE OF CALIFORNIA
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1-800-822-6228 – WWW.ENERGY.CA.GOV

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

DOCKET NO. 11-AFC-2

PROOF OF SERVICE
(Revised 2/1/2012)

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DECLARATION OF SERVICE

I, Mary Finn, declare that on February 9, 2012, I served and filed copies of the attached Hidden Hills SEGS Data Response , Set 2A dated February 9, 2012. This document is accompanied by the most recent Proof of Service list, located on the web page for this project at: [www.energy.ca.gov/sitingcases/hiddenhills/index.html].

The document has been sent to the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission's Docket Unit or Chief Counsel, as appropriate, in the following manner:

(*Check all that Apply*)

For service to all other parties:

_x_ Served electronically to all e-mail addresses on the Proof of Service list;

_x_ Served by delivering on this date, either personally, or for mailing with the U.S. Postal Service with first-class postage thereon fully prepaid, to the name and address of the person served, for mailing that same day in the ordinary course of business; that the envelope was sealed and placed for collection and mailing on that date to those addresses NOT marked "e-mail preferred."

AND

For filing with the Docket Unit at the Energy Commission:

_x_ by sending an electronic copy to the e-mail address below (preferred method); *OR*

___ by depositing an original and 12 paper copies in the mail with the U.S. Postal Service with first class postage thereon fully prepaid, as follows:

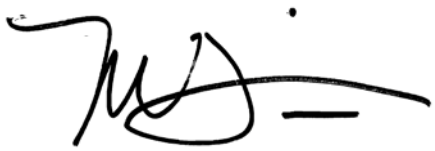
CALIFORNIA ENERGY COMMISSION – DOCKET UNIT
Attn: Docket No. 11-AFC-2
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512
docket@energy.state.ca.us

OR, if filing a Petition for Reconsideration of Decision or Order pursuant to Title 20, § 1720:

____ Served by delivering on this date one electronic copy by e-mail, and an original paper copy to the Chief Counsel at the following address, either personally, or for mailing with the U.S. Postal Service with first class postage thereon fully prepaid:

California Energy Commission
Michael J. Levy, Chief Counsel
1516 Ninth Street MS-14
Sacramento, CA 95814
mlevy@energy.state.ca.us

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct, that I am employed in the county where this mailing occurred, and that I am over the age of 18 years and not a party to the proceeding.



Mary Finn
CH2M Hill