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File No.: 04.03.06.03
Project No. 357891

California Energy Commission
Attn: John Kessler
1516 9th Street, MS-15
Sacramento, CA 95814-5504

RE: Biological Mitigation Proposal ("Mitigated Ivanpah 3")
Ivanpah Solar Electric Generating System (07-AFC-5)

Dear Mr. Kessler:

On behalf of Solar Partners I, LLC, Solar Partners II, LLC, and Solar Partners VIII, LLC, please find attached 12 hard copies and 12 CD-ROMs of the Applicant's Biological Mitigation Proposal for your consideration. It is being submitted to BLM as a comment on the Draft EIS. A copy of this Mitigation Proposal, also sometimes referred to as "Mitigated Ivanpah 3," is being filed electronically with the parties.

Sincerely,

CH2M HILL

John L. Carrier

John L. Carrier, J.D.
Program Manager

Enclosure
c: POS List
Project File

Ivanpah Solar Electric Generating System (ISEGS)

(07-AFC-5)

Biological Mitigation Proposal ("Mitigated Ivanpah 3")

Submitted to the

Bureau of Land Management and the California Energy Commission

Submitted by

Solar Partners I, LLC; Solar Partners II, LLC; and Solar Partners VIII, LLC

February 11, 2010

With Assistance from

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SECTION 1

Introduction

1.1 Overview of the Biological Mitigation Proposal ("Mitigated Ivanpah 3")

During the California Energy Commission evidentiary hearings on the Ivanpah SEGS project, written and oral testimony of Commission Staff and Intervenors (the "Parties") focused heavily on the impacts associated with Ivanpah 3, the northernmost, nominal 200-MW plant. For example, the Commission Staff and Intervenors stated that Ivanpah 3 contains more rare plants[1] and ephemeral washes than the Ivanpah 1 and Ivanpah 2 sites. Similarly, the area also contains 15 percent of the desert tortoises located within the power plant site during the 2007 and 2008 surveys (3 of the 20 live tortoises observed within the project boundary). The Applicant has, since the close of Evidentiary Hearings, continued to exercise due diligence by examining reduced footprint configurations to offer further mitigation addressing these concerns.

Based upon this due diligence review and discussion with some Parties, the Applicant has identified a reduced footprint configuration that merits further consideration by the Commission and the BLM. The Applicant's reduced footprint configuration focuses on the northernmost portion of the site, where Ivanpah 3 would be located, because it is the project area of most concern to the Parties. The Applicant's reduced footprint configuration for Ivanpah 3 has come to be known during our due diligence review as the "Mitigated Ivanpah 3" configuration.

Among the more important benefits, the Mitigated Ivanpah 3 configuration would:

- Further avoid and minimize potential impacts to rare plants by completely avoiding the most densely populated rare plant communities in the northernmost portions of Ivanpah 3.
- Further avoid and minimize potential impacts to desert tortoise, reducing the total tortoise relocation by 15 percent[2], and providing additional area for relocation that is within the home range of the tortoise, that has a high density of rare plants and that Intervenors believe has comparatively better habitat value.
- Further avoid and minimize the potential impacts to a significant number of large ephemeral washes located in the northernmost portions of Ivanpah 3, helping the project meet the Low Impact Design (LID) objectives by allowing stormwater to flow through the project site.

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[1] The term "rare plant" is used here to describe six plant species that CEC Staff believe require mitigation. BLM classifies only one of these six species, Rusby's Desert Mallow, to be a sensitive species. While the Applicant agrees with BLM that only one of the six species identified by Staff is properly classified as rare, we refer in this document to all six species as rare and we have developed mitigation proposals to address all six species.

2 Based on 2007 and 2008 protocol surveys that located 25 desert tortoises. Twenty were within the project boundary and three were within the 433-acre area.

- Further avoid and minimize potential impacts to the project areas that would have required the most grading and large rock removal; thus, reducing by 88 percent the area in Ivanpah 3 requiring grading.
- Further avoid and minimize the potential Visual Resources impacts associated with glare and reflectivity by reducing the number of power towers in Ivanpah 3 from five to just one tower, and for the entire project from seven to three towers.
- Further avoid and minimize the potential Visual Resources impacts associated with glare and reflectivity by reducing the number of heliostats by more than 40,000.
- Reduce the northernmost portion of the site by 433 acres (approximately 24 percent of the present Ivanpah 3 configuration), and the overall footprint of the Ivanpah project by about 12 percent.
- Increase the distance between the site and the mountain range to the north and increasing potential foraging area and migration corridor for various species.

The Mitigated Ivanpah 3 configuration substantially reduces the footprint of the Ivanpah 3 site by about 433 acres avoiding completely the portion of the site that has the greatest concentration of rare plants. Mitigated Ivanpah 3 has the distinct advantage of being located entirely within areas that have already been closely scrutinized and surveyed for desert tortoise, rare plants, other biological resources and geotechnical issues by both the Applicant's and the agencies' biologists, botanists, hydrologists, geologists, and other experts.

While the Applicant continues to believe that the impacts associated with the nominal 200-MW Ivanpah 3 solar plant arrangement have been reduced to a level of less than significant with the mitigation proposed in our testimony, the Mitigated Ivanpah 3 configuration provides numerous additional environmental benefits, offering further avoidance and minimization of potential impacts.

There are, of course, tradeoffs associated with the Mitigated Ivanpah 3 configuration. Most notably, the Mitigated Ivanpah 3 configuration would result in a capacity reduction of the nominal 200 MW that is currently proposed for Ivanpah 3. While the Applicant may be able to make up some of the lost capacity by adjusting the size of the steam turbines for Ivanpah 2 and 3, the total capacity of the three of the three Ivanpah plants would be reduced on a nominal basis, from 400 to 370 MW, or, on a gross basis, from 440 to 392 MW. The Mitigated Ivanpah 3 proposal would also reduce construction efforts, with the result of a slight reduction in workforce and economic benefits. Notwithstanding the adjustment of the capacity of the steam turbines for Ivanpah 2 and 3, the Project's boilers—the sources of air emissions—would actually be slightly less as a result of the refined configuration because of the smaller boiler in Ivanpah 3. Thus, the potential air quality impacts would be reduced with the Mitigated Ivanpah 3 configuration.

1.2 Summary of Environmental Impacts

The only substantive issues that are affected by the proposed Mitigated Ivanpah 3 configuration are Biological Resources and Visual Resources, with the reductions in

potential environmental impacts for these disciplines being decidedly positive. Air Quality emissions would also be less due to the reduction in size of the Ivanpah 3 auxiliary boiler to half the former proposed size and the removal of one of the emergency diesel generators. In addition, construction emissions would be slightly reduced. Hence, the public health impacts, already found to be less than significant, would also be slightly less with Mitigated Ivanpah 3.

With a smaller project footprint and somewhat reduced construction effort, traffic impacts of the Mitigated Ivanpah 3 configuration would be slightly less. The reduced workforce and reduced capital cost would not change the less-than-significant socioeconomic impacts to school and public utilities, but would slightly reduce the positive socioeconomic benefits to the San Bernardino and Clark counties. The reduced construction footprint would also reduce construction waste slightly and the potential impacts to Soils and Water Resources from the smaller construction footprint and reduced grading. Potential impacts to Cultural Resources, Geology, Land Use, Noise, Paleontological Resources, and Worker Safety would be slightly less that those associated with the present 200 MW Ivanpah 3 configuration.

SECTION 2

Description of the Biological Mitigation Proposal ("Mitigated Ivanpah 3")

This section provides a description of the Biological Mitigation Proposal.

2.1 Proposed Mitigation Affecting the Project Description

The Applicant's proposal of a Mitigated Ivanpah 3 alternative attempts to accommodate Commission Staff's suggestion, and those of some Intervenors, to reduce the botany and other biological resource impacts in Ivanpah 3 by avoiding construction in the northern-most section of the site, as well as to reduce botany impacts within the Construction Logistics Area (CLA). This Biological Mitigation Proposal includes the following key changes to the project description:

- Removes approximately 433 acres from the northern portion of the Ivanpah 3 and more than 40,000 heliostats
- Reduces the number of power towers in Ivanpah 3 from five to one, and of the entire Ivanpah project from seven to three
- Relocates the power block for Ivanpah 3
- Realigns the boundary between Ivanpah 2 and 3 and the heliostat fields
- Realigns some roads and utilities within the project footprint
- Relocates the administration building and water supply wells within the Construction Logistics Area (CLA)
- Removes approximately 109 acres from construction use within the CLA

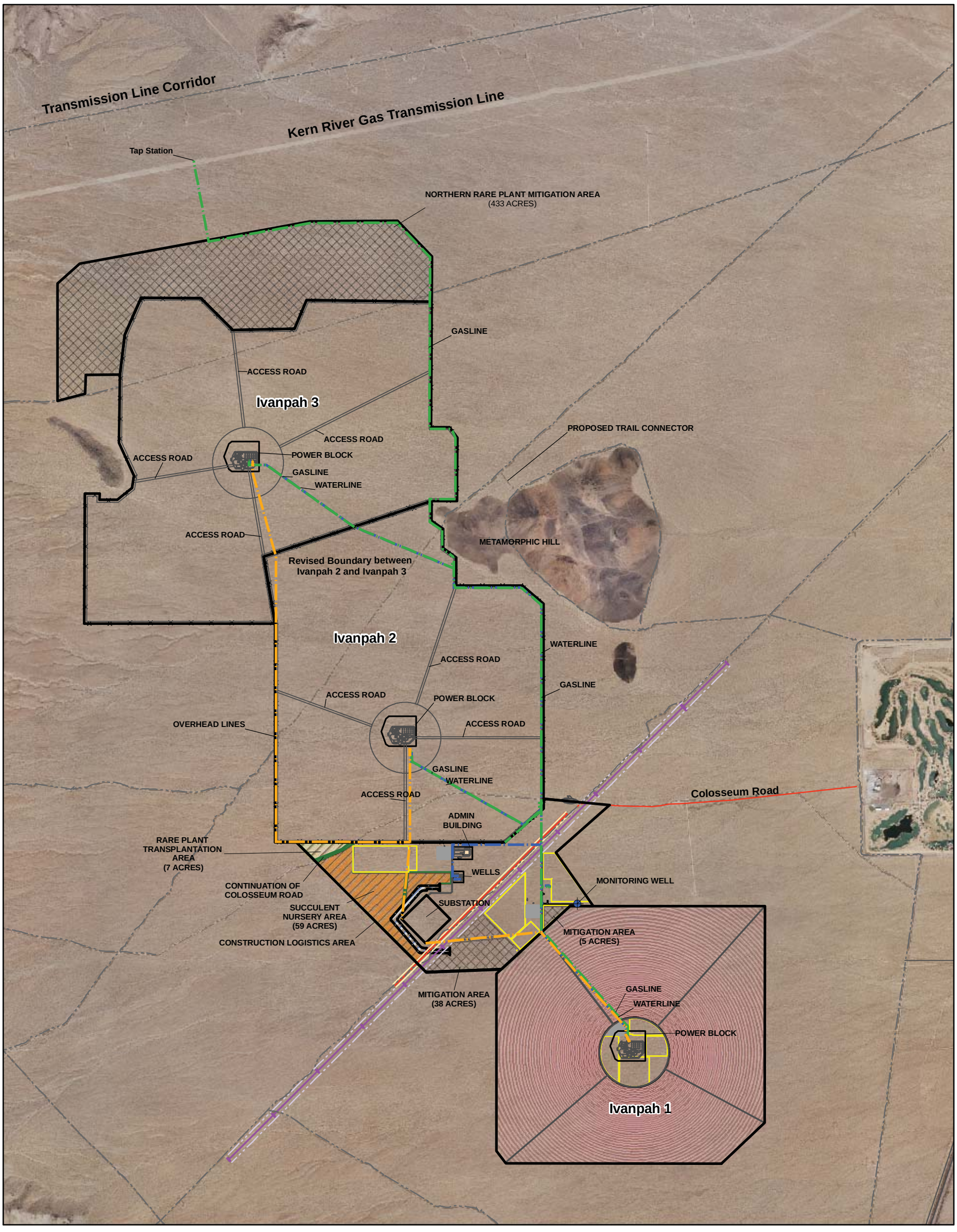
As BLM and the Commission are aware, northern heliostats (i.e., south-facing mirrors) are highly valued collectors, given their ability to track the sun throughout the day. In recognition of the value of northern heliostats, the southern boundary between Ivanpah 2 and Ivanpah 3 has been realigned to allow heliostats that were formerly southern heliostats for Ivanpah 3 to be rotated approximately 180 degrees to become northern heliostats in Ivanpah 2. With the realignment of the boundaries, the interior roads in Ivanpah 2 and 3 that radiate out from the central power block to the corners of the heliostat field were also realigned. A site plan is provided in Figure 2-1 (all figures are at the end of the section). A rendering of the new layout is provided in Figure 2-2. As configured under the Mitigated Ivanpah 3 alternative, the size of the three units is provided in Table 2-1.

TABLE 2-1
Size of Units

Unit	Acreage	Nominal Output	Approx. Number of Heliostats
Ivanpah 1	913	120 MW	53,500
Ivanpah 2	1,097	125 MW	60,000
Ivanpah 3	1,227	125MW	60,000
Total	**3,237**	**370 MW**	**173,500**

As the project moves into detailed design, some of the structures within the CLA have been moved and areas needed for construction have been reduced. The proposed CLA arrangement is shown in Figure 2-3. This arrangement would remove about 109 acres of the 377-acre CLA from construction use, avoiding rare plants located in those areas and setting aside that area for use as the plant nursery for relocation of salvaged cacti and rare plants.

The reduced footprint associated with Mitigated Ivanpah 3 and the reduction of the acreage of the CLA are both substantial: 433 acres reduced at Ivanpah 3 and 109 acres removed from construction in the CLA for a total reduction of approximately 542 acres. The 542-acre reduction represents an approximately 12 percent reduction in acreage of the entire 4,062-acre project footprint. As described in the AFC, the initial Plan of Development was for 7,040 acres. With the Mitigated Ivanpah 3 arrangement, the 3,520-acre Mitigated Ivanpah 3 project would be half the size of the original 7,040-acre proposed property boundary.



LEGEND

Wells

Heliostat Features
- Heliostat Maintenance Paths
- Heliostat Arrays

Main Utility Features
- Proposed Overhead Line
- Proposed Gas Line (50-foot Corridor)
- Proposed Water Line
- Facility Areas
- Existing 500 KV Line
- Existing 115 KV Line

Project Roads
- Proposed Dirt Roads
- Proposed Gravel Road
- Proposed Paved Road
- Trails

Site Features
- Proposed Fence
- Diversion Chanel
- Rare Plant Transplantation Area
- Succulent Nursery
- Rare Plant Mitigation Area

N

0 1,500 3,000
Feet

Notes:
1. Design pending for Ivanpah 3 / Ivanpah 2 heliostats arrays.
2. Site feature acreages rounded to nearest whole number.
3. Map Revised 02/08/2010.

Figure 2-1
Ivanpah Site Plan
Ivanpah Solar Electric Generating System

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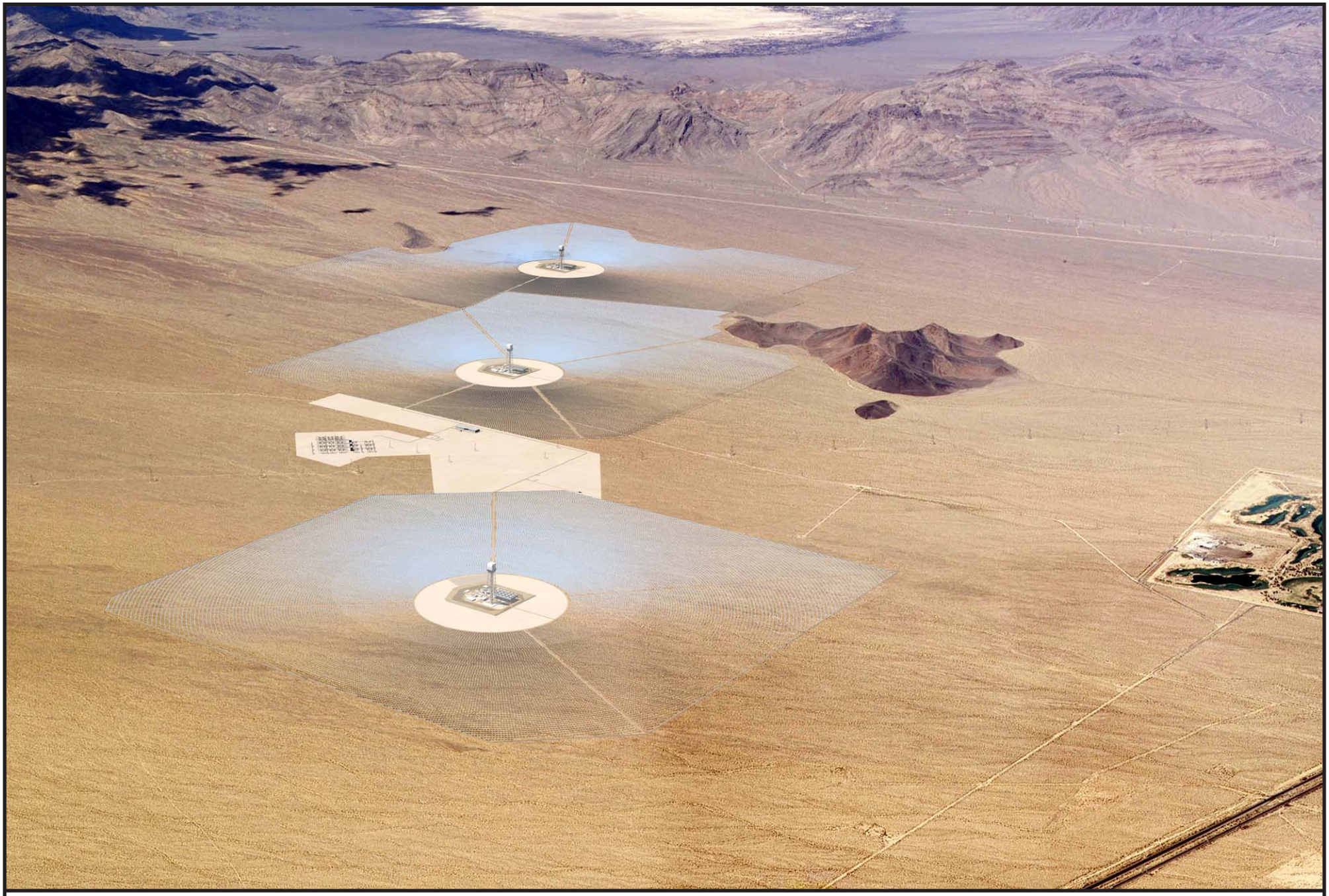

FIGURE 2-2
ARTIST RENDERING OF THE BIOLOGICAL MITIGATION PROPOSAL
IVANPAH SOLAR ELECTRIC GENERATING SYSTEM

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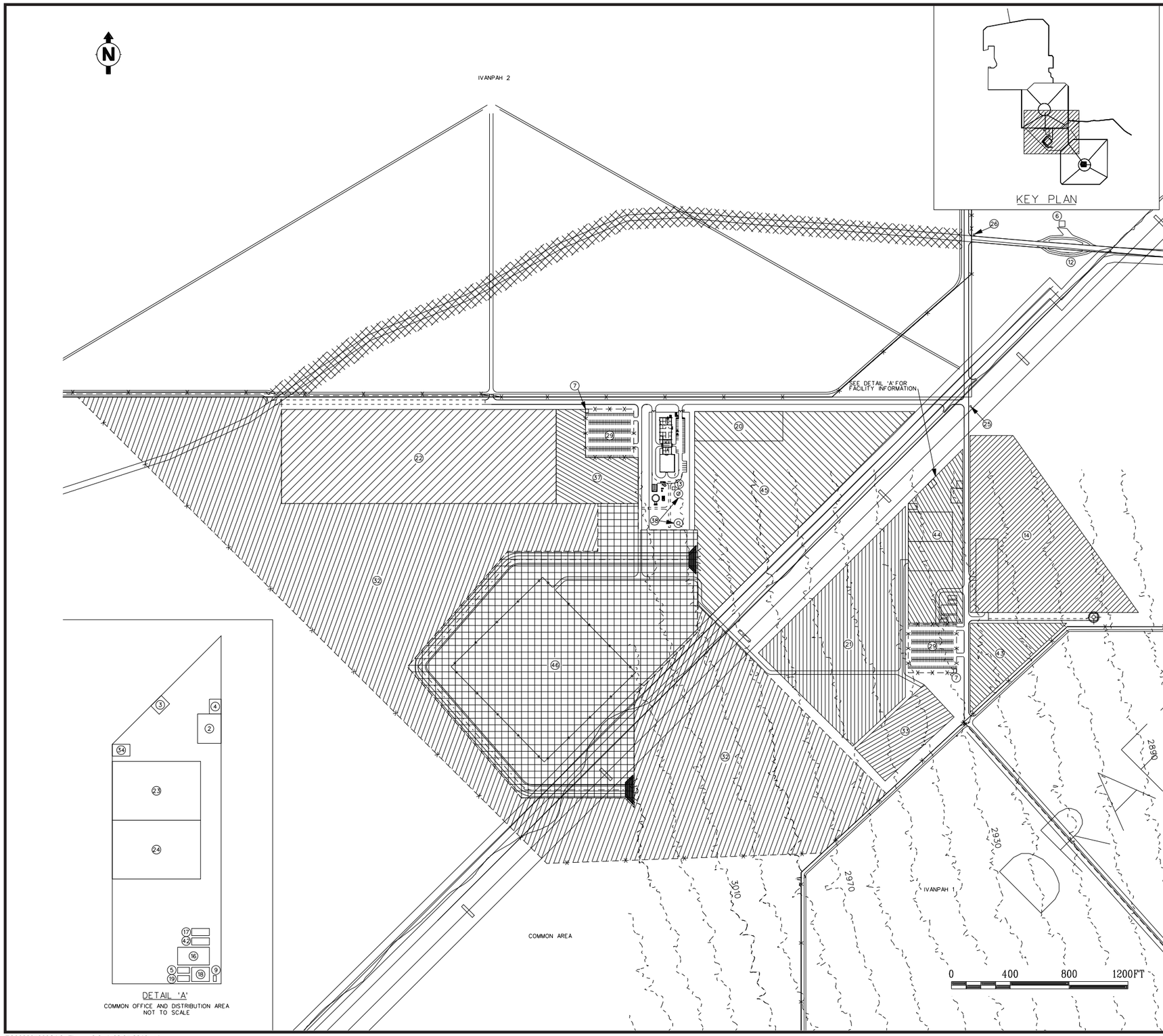
INSERT Figure 2-3, Construction Logistics Area Site Plan



ITEM NO.	DESCRIPTION
1	COOL DOWN STATION (20' x 40')
2	EQUIPMENT MAINTENANCE AREA (80' x 100')
3	HAZARDOUS WASTE/MATERIAL STORAGE AREA (40' x 50'
4	EQUIPMENT AND VEHICLE FUELING FACILITY (40' x 50')
5	DRINKING WATER/ICE PREPARATION STATION (40' x 20')
6	CONCRETE TRUCK WASH OUT (40' x 40')
7	BRASS ALLEY - MAIN (25' x 20')
8	BRASS ALLEY - REMOTE (25' x 20')
9	TOILET TRAILER - COMMON (10' x 20')
10	TOILET TRAILER - POWER BLOCK (12' x 20')
11	TOOL ROOM - POWER BLOCK (16' x 20')
12	WHEEL WASH STATION
13	RO STATION (20' x 20')
14	HELIOSTAT BUILDING AND STAGING AREA (19.84 ACRES)
15	POWER BLOCK CONSTRUCTION OFFICE (48' x 60')
16	COMMON AREA CONSTRUCTION OFFICE (108' x 60')
17	BSE COMMON AREA OFFICE (24' x 60')
18	COMMON AREA SAFETY, ORIENTATION, BADGING, DRUG SCREENING AND TRAINING FACILITY (48' x 60')
19	WELD TEST SHOP (40' x 20')
20	EXCAVATION SPOILS/TOP SOIL STOCKPILE AREA (2.75 ACRES)
21	UNIT 1 MATERIAL STAGING AREA (19.94 ACRES)
22	UNIT 2 MATERIAL STAGING AREA (27.44 ACRES)
23	MATERIAL RECEIVING AREA (200' x 300')
24	INDOOR STORAGE AREA AND WAREHOUSE (200' x 300')
25	MAIN SECURITY STATION (10' x 10')
26	UNIT 3 SECURITY STATION (10' x 10')
27	POWER BLOCK SAFETY OFFICE (60' x 24')
28	ROD ROOM (12' x 20')
29	CRAFT PARKING AREA - COMMON (2.26 ACRES)
30	CRAFT PARKING AREA - POWER BLOCK (2.54 ACRES)
31	CRAFT CHANGE HOUSE (40' x 40')
32	NURSERY (128.51 ACRES)
33	BOILER FABRICATION SHOP/STAGING AREA (4.41 ACRES)
34	COMPRESSED GAS STORAGE AREA (40' x 60')
35	EQUIPMENT PARKING AREA - POWER BLOCK (40' X 70')
36	STRUCTURAL/BOILER STAGING AND PREASSEMBLY AREA (0.21 ACRES)
37	UNIT 2 FABRICATION YARD (5.00 ACRES)
38	WATER TRUCK FILLING STATION
39	POWER BLOCK STAGING AND FABRICATION AREA (33.82 ACRES)
40	33KV/4160 TRANSFORMER AREA (15' x 15')
41	5KV/480 TRANSFORMER AREA (15' x 10')
42	CONFERENCE TRAILER (24' x 60')
43	UNDISTURBED AREA (4.56 ACRES)
44	COMMON OFFICE AND DISTRIBUTION AREA (8.48 ACRES)
45	CONSTRUCTION LOGISTICS AREA (25.29 ACRES)
46	SWITCHYARD CONSTRUCTION AREA (56.28 ACRES)

NOTES:

1. STAGING AND FABRICATION AREA TO BE CLEARED, GRADED AND ROCKED AS REQUIRED.
2. POWER BLOCK FACILITIES TYPICAL FOR ALL THREE UNITS.

—X— —X— TEMPORARY CONSTRUCTION FENCING. 4' HIGH CHAIN LINK OR SNOW FENCE WITHOUT TORTOISE GUARD.

FIGURE 2-3
CONSTRUCTION LOGISTICS AREA SITE PLAN
IVANPAH SOLAR ELECTRIC GENERATING SYSTEM

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SECTION 3

Environmental Analysis of the Biological Mitigation Proposal ("Mitigated Ivanpah 3")

The Mitigated Ivanpah 3 alternative would result in reduced impacts compared to those addressed in the Applicant's testimony and described in the Final Staff Assessment/Draft Environmental Impact Statement (FSA/DEIS). For those disciplines where the impacts were found to be less than significant in the FSA/DEIS, the Mitigated Ivanpah 3 configuration would serve to lessen impacts already determined to be less than significant. Further, as discussed below, the Applicant believes that this Biological Mitigation Proposal reduces all impacts to a level of less than significant, including impacts associated with Biological Resources and Visual Resources. A complete summary of the beneficial effects of the Mitigated Ivanpah 3 configuration on all disciplines is provided below.

3.1 Air Quality

The proposed mitigation measures that potentially affect air quality are:

- 50 percent reduction in the size and fuel usage (hourly, daily, and annual) in the Ivanpah 3 boiler
- Elimination of one of the two Ivanpah 3 emergency engines
- Relocation of the Ivanpah 3 power block, including the three emitting sources (boiler, emergency engine, fire pump engine)

The effect of the first two changes alone would reduce Ivanpah 3's air impacts from the levels reported in the AFC. Impacts from Ivanpahs 1 and 2 will not be affected by the Mitigated Ivanpah 3 configuration.

In order to determine how the relocation of the Ivanpah 3 power block would affect impacts from the project, the air quality dispersion model that was used in the AFC was used to model the new Mitigated Ivanpah 3 configuration. The predicted impacts from relocating the Ivanpah 3 Power block are compared with the predicted impacts for the original location in Table 3.1-1.

With the exception of NO_2 impacts, Mitigated Ivanpah 3 results in reduced air quality impacts from Ivanpah 3, and from the project as a whole. With the exception of NO_2 impacts, short term (1-hour average and 3-hour average) impacts are substantially reduced; longer-term impacts (24-hour and annual average) are lower, but not by much.

The maximum one-hour NO_2 project impact is almost identical to the already less than significant maximum one-hour impact from testing the Ivanpah 3 emergency generator engine. In the AFC, Ivanpah 3 had two emergency engines, which were expected to be tested at different times. Under the proposed Mitigated 3 configuration, there is only one

TABLE 3.1-1
Modeled Maximum Impacts

Pollutant	Averaging Time	Maximum Facility Impact ($\mu g/m^3$) (AFC)	Maximum Facility Impact ($\mu g/m^3$) (Mitigated Ivanpah 3)
NO_2	1-hour	123.7	126.7
	Annual	0.0	0.0
SO_2	1-hour	4.1	2.8
	3-hour	1.1	0.9
	24-hour	0.0	0.0
	Annual	0.0	0.0
CO	1-hour	73.3	34.3
	8-hour	1.6	1.4
PM_{10}	24-hour	0.2	0.1
	Annual	0.0	0.0
$PM_{2.5}$	24-hour	0.2	0.1
	Annual	0.0	0.0

emergency engine at Ivanpah 3. Thus, the proposed change results in a 50 percent reduction in annual emissions from the emergency engine, but no reduction in hourly maximum emissions since only one engine would have operated at any time even with the old two-engine design. The proposed new location of the engine results in a slightly higher maximum 1-hour NO_2 impact, but is still less than significant. Tables and technical information supporting these conclusions are included as Attachment A.

As a result of the Mitigated Ivanpah 3 arrangement, any potential air quality impacts would be further reduced. In addition, the proposed Mitigated Ivanpah 3 would not affect compliance with applicable LORS. Consequently, any potential air quality impacts associated with this Mitigation Proposal would be less than significant.

3.2 Biological Resources

3.2.1 Desert Tortoise

The Mitigated Ivanpah 3 configuration would benefit the desert tortoise by avoiding long-term impacts to 433 acres of habitat, and provide additional area for tortoise relocation within their home range. These 433 acres of habitat would remain available to tortoises for foraging, cover, and other life cycle requirements. While it is unknown how many tortoises would be in this area at the time of construction, 3 of the 20 live tortoises observed within the project boundary during the 2007 and 2008 surveys would be avoided resulting in the need to relocate about 15 percent fewer tortoises (see Figure 3-1). At a minimum, 17 existing burrows in this area would also be preserved.

While all of the Ivanpah SEGS project area is within tortoise habitat, most biologists agree that Ivanpah 3 supports relatively better quality habitat than areas to the south closer to Interstate 15 (I-15). This assessment is based on relatively greater frequency with which

tortoise sign is observed, increased vegetative diversity and density, greater number of ephemeral washes in the northern portion of the project area and the greater number of tortoises found during spring surveys. Reducing the project footprint in this area is likely to have greater benefit to tortoises than would reductions in other areas. It also opens this 433-acre area as a site for potential tortoise relocation.

The proposed CLA arrangement, with the removal 109 acres of the 377-acre area from construction use would also likely benefit tortoises. Preserving some vegetation in those areas would likely improve the post-operation reclamation of tortoise habitat.[3]

3.2.2 Rare Plants

Overview

The Mitigated Ivanpah 3 arrangement would result in the establishment of three rare plant mitigation areas located in two general areas onsite (Figure 3-2), in addition to establishing several smaller avoidance areas for two of the six rare plants for which mitigation is recommended by Staff. The rare plant mitigation approach proposed for the Mitigated Ivanpah 3 configuration is consistent with the general rare plant avoidance measures described in the FSA/DEIS and as depicted in FSA/DEIS Biological Resources Figure 2.

Rare Plant Mitigation and Protection Areas

The largest rare plant avoidance area is the Northern Rare Plant Mitigation Area (NRPMA). The NRPMA is located north of Ivanpah 3 and totals 433 acres (Table 3.2-1). In the Construction and Logistics Area (CLA), two smaller areas are proposed. These are Rare Plant Mitigation CLA Area 1 and Rare Plant Mitigation CLA Area 2, totaling approximately 38.2 and 4.6 acres, respectively.

TABLE 3.2-1
Rare Plant Mitigation Areas and Other Undisturbed Areas – Mitigated Ivanpah 3 Configuration

Rare Plant Mitigation Areas	Acres
Northern Rare Plant Mitigation Area (NRPMA) (North of Ivanpah 3)	433
Construction Logistics Area	
Rare Plant Mitigation Area 1 (East of Existing Transmission Line, adjacent to Ivanpah 1)	38
Rare Plant Mitigation Area 2 (Southeast of Substation)	5
Subtotal	*476*
Other Areas Undisturbed by Construction	
Rare Plant Transplantation Area (Northwest of Substation)	7
Succulent Nursery	59
Subtotal	*66*
Total Acreage – All Areas Undisturbed by Construction	**542**

[3] Applicant will brief the issues related to how much compensatory mitigation is required for desert tortoise mitigation.

In addition to, and not included in the acreage total, are several smaller rare plant avoidance areas for two species, Mojave milkweed and Rusby's desert mallow.[4] The locations of these smaller avoidance areas are shown on Figure 3-2. These smaller avoidance locations are the same areas as presented in the Ivanpah SEGS Special-Status Plant Avoidance and Protection Plan [Exhibit 81]. They have been selected to avoid and protect 100 percent of the Rusby's desert mallow and the Mojave milkweed areas with the highest densities of plants to the maximum extent practicable while achieving energy generation objectives.

Other Areas Undisturbed by Construction

In addition to the three rare plant mitigation areas, a 7.2-acre area northwest of the substation within the CLA has been set aside as a Rare Plant Transplantation Area, should monitoring determine that remedial measures such as transplantation are needed. This area will only be used for rare plant species to reduce the amount of disturbance to salvaged rare plants. A 59.4-acre Succulent Nursery is located adjacent to the Rare Plant Transplantation Area. Areas undisturbed by direct construction in the CLA (the Rare Plant Mitigation CLA Area 1 and Rare Plant Mitigation CLA Area 2, the Rare Plant Transplantation Area, and Succulent Nursery) total approximately 109 acres. Combined, the three Rare Plant Mitigation Areas, the Rare Plant Transplantation Area and the Succulent Nursery within the CLA that will not be directly affected by construction total approximately 542 acres (Table 3.2-1).

Comparison of the M3 Configuration to the 200-MW Ivanpah 3 Configuration

A tabular comparison of the amount of rare plant avoidance (on a locality basis) that would be possible under the 200 MW Ivanpah 3 configuration as shown in Exhibit 81 and the Mitigated Ivanpah 3 project footprint is provided below in Table 3.2-2. As described in the FSA/DEIS, rare plant avoidance is strongly preferred by CEC Staff over rare plant salvage or translocation. The Mitigated Ivanpah 3 rare plant mitigation approach overall has a higher percentage of rare plant avoidance and protection than that described in Exhibit 81 (with the 200 MW Ivanpah 3 configuration). The total amount of avoidance for all species combined, proposed in the Mitigated Ivanpah 3 (40 percent), is higher than that outlined previously in Exhibit 81 (31 percent) (see Table 3.2-2). Rare plant protection is provided within large expanses of habitat in the Mitigated Ivanpah 3 configuration rather than just within the smaller rare plant avoidance zones in the heliostat array as proposed in Exhibit 81. In general, large blocks of habitat, such as the Northern Rare Plant Mitigation Area, are more ecologically valuable because natural ecosystem processes (such as seed dispersal) will remain intact. The Northern Rare Plant Mitigation Area is contiguous to large expanses of undisturbed habitat located to the north of Ivanpah 3 and it is also expected that large-scale ecological dynamics such as natural surface water hydrology will be unaltered.

[4] The Applicant focused on Rusby's desert mallow, since it is a CNPS List 1 plant (Rare or Endangered in California and elsewhere). Applicant also included Mojave milkweed, CNPS List 2 plant, because CEC Staff's expressed interest in the Mojave milkweed.

TABLE 3.2-2
Comparison of Total Rare Plant Localities Avoided - 200-MW Ivanpah 3 versus Mitigated Ivanpah 3

		Total Avoided Localities		Percent of Localities Avoided	
Scientific Name	**Common Name**	**200-MW Ivanpah 3[a]**	**Mitigated Ivanpah 3[b,c]**	**200-MW Ivanpah 3[a]**	**Mitigated Ivanpah 3[b,c]**
Androstephium breviflorum	Small-flowered androstephium[c]	0[d]	0[d]	0%[d]	0%[d]
Asclepias nyctaginifolia[e]	Mojave milkweed	50	49*	86%	84%
Coryphantha chlorantha	Desert pincushion	95	72	45%	34%
Enneapogon desvauxii	Nine-awned pappus grass	0	63	0%	48%
Grusonia (=Opuntia) parishii	Parish's club-cholla	29	28	22%	21%
Sphaeralcea rusbyi var. *eremicola*	Rusby's desert mallow	10	10	100%	100%
Total		**184**	**222**	**31%**	**40%**

Notes

[a] Data from Exhibit 81, Ivanpah SEGS Special Status Plant Avoidance and Protection Plan, January 2010. This Exhibit included the 200-MW Ivanpah 3 Configuration

[b] Data from Mitigated Ivanpah 3 Configuration that includes the Northern Rare Plant Mitigation Area (February 2010). Rare Plants that are not avoided (fenced and protected) or salvaged are referred to as no treatment. These data are not included in this table.

[c] NRPMA = Northern Rare Plant Mitigation Area

[d] Small-flowered androstephium (*Androstephium breviflorum*) was not included in Exhibit 81; therefore, it was not included in January 2010 avoidance calculations. This species will be salvaged.

[e] Mojave milkweed was observed in Ivanpah 1 in 2007; however, the exact location is unknown and it was not mapped. To be conservative, this locality and one individual plant are assumed impacted for the purposes of these calculations.

Definition of Avoided: The extent of a rare plant locality will be staked and/or fenced to avoid direct impacts during construction. Rare plant performance monitoring during construction and post-construction success criteria and compliance monitoring will be conducted per steps outlined in Exhibit 81.

Species that are to be salvaged are not included in this table.

Special Status Cactus Species

Avoidance previously focused on protecting smaller amounts of habitat within the heliostat array over a larger extent of the species' local distribution. The percentage of avoidance of Parish's club-cholla under the Mitigated Ivanpah 3 layout is almost the same as that previously proposed (21 percent to 22 percent). The amount of avoidance for desert pincushion with the Mitigated Ivanpah 3 is less than that previously proposed (34 percent to 45 percent) but avoidance is attained within a larger block of habitat within which ecological processes can take place. Under the Mitigated Ivanpah 3 rare plant mitigation approach, the two rare cactus species (Parish's club-cholla and desert pincushion) that are not avoided will be removed and transported to the Succulent Nursery and monitored as part of the Succulent Salvage Program.

The two mitigation approaches differ in the degree of salvage that would be performed as part of the Rare Plant Mitigation Program; (65 percent overall is described in Exhibit 81

compared to 2 percent under the Mitigated Ivanpah 3 configuration. As described earlier, salvage is not viewed as the best rare plant mitigation method and rare plant impact avoidance is preferred by Staff.

Rare plant localities designated as salvaged on Figure 3-2 (for example, the Mojave milkweed localities that are in an area to be graded) will be removed and transported to the Rare Plant Transplantation Area or other location with similar micro-habitat conditions.

Mojave Milkweed and Rusby's Desert Mallow

For two species, Mojave milkweed and Rusby's desert mallow, the number of avoided localities under the two mitigation approaches are essentially the same. Both approaches would result in a little more than 80 percent avoidance of the identified Mojave milkweed and 100 percent of Rusby's desert mallow (Table 3.2-2).

In the Mitigated Ivanpah 3 configuration, all localities of Mojave milkweed and Rusby's desert mallow in the northern part of Ivanpah 3 would be protected within a larger block of habitat (433 acres). Within this area, it is expected that ecological processes could occur on a larger scale within the mitigation area and the mitigation area would be ecologically connected to the nearby contiguous blocks of undisturbed habitat. The proposal described in Exhibit 81 would protect smaller blocks of habitat surrounding each locality but over a more widely distributed area throughout the local distribution of these species onsite.

The rare plant mitigation approach for the Mitigated Ivanpah 3 is designed to protect the portions of the site with the highest rare plant densities. However, rare plant avoidance at this site is challenging because the rare plants species have widely-scattered distribution patterns. For example, all three Rare Plant Mitigation Areas combined contain relatively few numbers of Mojave milkweed and Rusby's desert mallow, two species determined in the FSA/DEIS to be of particular concern (Figure 3-2). For this reason, in addition to rare plant protection within Rare Plant Mitigation Areas, all of the Mojave milkweed and Rusby's desert mallow localities outside of areas proposed for grading (e.g., power blocks) will be avoided during construction and protected as described in Exhibit 81.

Monitoring and Management

The Mojave milkweed and Rusby's desert mallow rare plant avoidance and protection areas within the heliostat fields will be fenced during construction to avoid inadvertent encroachment. Fencing will be removed following construction and an alternative marking material (e.g., posts or stakes) will be installed to indicate the areas where avoided plants are located. This will allow ecological connectivity between the Rare Plant Mitigation Areas, the smaller Mojave milkweed and Rusby's desert mallow rare plant avoidance and protection areas, and other areas of undisturbed contiguous habitat, allowing seed dispersal, pollinator movement, and other ecological processes to occur. Monitoring of the Mojave milkweed and Rusby's desert mallow rare plant avoidance and protection areas within the heliostat fields will occur in accordance with Exhibit 81.

No grading, mowing, or other construction or operation activities would occur within the three Rare Plant Mitigation Areas (the NRPMA, CLA-1, and CLA-2). As described in Exhibit 81, the smaller Mojave milkweed and Rusby's desert mallow avoidance and protection areas would not be mowed or graded during construction, but during operation,

limited mowing may be needed beneath the heliostat mirrors. Limited weed control, if determined necessary to maintain rare plant populations over time, may be performed within both the rare plant avoidance and protection areas that are located within the heliostat fields. A substantial benefit of the Mitigated Ivanpah 3 rare plant avoidance and protection approach is that these larger rare plant mitigation areas will have a greater degree of protection by being removed from operational activities.

3.2.3 Restoration and Reclamation

Avoiding 433 acres with the Mitigated Ivanpah 3 design would remove that area from the need to be revegetated once the project is decommissioned, reducing the area to be reclaimed by about 12 percent. Similarly, Table 1-1R in Data Response Set 2KR [Exhibit 31], identified about 297 acres of temporary disturbance that would need to be revegetated once construction is completed. Removing approximately 109 acres in the CLA from construction use would reduce the area requiring revegetation/restoration at the end of construction by about 37 percent.[5]

3.2.4 Conclusion

With implementation of the proposed mitigation measures, impacts to Biological Resources would be less than significant. In addition, the proposed reduction in the project area would not affect compliance with applicable LORS.

3.3 Cultural Resources

Reducing the size of Ivanpah 3 by 433 acres and removing 109 acres of the CLA from construction impacts, would further reduce the impacts on the project area that has been surveyed and determined to have low cultural sensitivity. In addition, the proposed reduction in the project area would not affect compliance with applicable laws, ordinances, regulations and standards (LORS). As a result, any potential cultural impacts associated with this Mitigation Proposal would be less than significant.

3.4 Geologic Hazards and Resources

Reducing the size of Ivanpah 3 by 433 acres and removing 109 acres of the CLA from construction impacts, would further reduce the impacts on the project area that has been analyzed for geologic hazards and resources. In addition, the proposed reduction in the project area would not affect compliance with applicable LORS. As a result, any potential geological impacts associated with this Mitigation Proposal would be less than significant.

3.5 Hazardous Materials Handling

Reducing the size of Ivanpah 3 by 433 acres and removing 109 acres of the CLA from construction impacts would not affect the analysis previously performed for hazardous materials handling. As a result of the reduction in the project area, any potential impacts to

[5] Applicant will brief the issues related to LORS compliance and the Staff's impacts findings as the Applicant continues to believe the project complies with all applicable LORS and results in no potentially significant impacts.

hazardous materials handling would b further reduced. In addition, the proposed mitigation would not affect compliance with applicable LORS. Consequently, any potential hazardous materials impacts associated with this Mitigation Proposal would be less than significant.

3.6 Land Use

As a result of reducing the size of Ivanpah 3 by 433 acres, a public access road is no longer proposed between the common boundary between Ivanpah 2 and 3. Hence, trail 699198 would be connected to trail 699617 that skirts the circumference of the large metamorphic hill on the east side of the project (see Figure 3-3). The location of the connecting segment was surveyed for rare plants in 2008, and none were found there. In addition, with the smaller size of Ivanpah 3, the rerouting of trail 699226, which would follow the northern edge of Ivanpah 3, would require less adjustment than under the prior arrangement.

The proposed mitigation would not affect compliance with applicable land use LORS. Consequently, any potential land use impacts associated with this Mitigation Proposal would be less than significant.[6]

3.7 Noise and Vibration

Reducing the size of Ivanpah 3 by 433 acres and removing 109 acres of the CLA from construction impacts would not affect the analysis previously performed for noise and vibration. As a result of the reduction in size, any potential noise impacts (generally resulting from construction noise) would be further reduced. In addition, the proposed mitigation would not affect compliance with applicable LORS. Consequently, any potential noise impacts associated with this Mitigation Proposal would be less than significant.

3.8 Paleontological Resources

Reducing the size of Ivanpah 3 by 433 acres and removing 109 acres of the CLA from construction impacts would not affect the analysis previously performed for Paleontological Resources. The alluvium that underlies the entire project site possesses low paleontological sensitivity. As a result of the reduction in size, any potential paleontological impacts would be further reduced. In addition, the proposed mitigation would not affect compliance with applicable LORS. Consequently, any potential paleontological impacts associated with this Mitigation Proposal would be less than significant.

3.9 Public Health

As described in the Air Quality section, the reduction in Ivanpah 3 emissions results in a reduction in project impacts. The reduced impacts also result in a reduction in the estimated risks from the project. The proposed improvements associated with Mitigated Ivanpah 3 reduce the potential impacts presented in the AFC and support the overall conclusion that

[6] Applicant will brief the issues related to LORS compliance and the Staff's impacts findings as the Applicant continues to believe the project complies with all applicable LORS and results in no potentially significant land use impacts.

the health impacts from the project are well below the thresholds and thus less than significant. The Mitigated Ivanpah 3 configuration is also consistent with applicable LORS.

3.10 Socioeconomics

Reducing the size of Ivanpah 3 by 433 acres and removing 109 acres of the CLA from construction impacts would result in a slight decrease in the capital cost of the project, reducing local purchases of materials and construction labor requirements. The FSA/DEIS determined that construction of Ivanpah SEGS would not cause significant population changes nor would it cause a significant increase in demand for school services. It was also previously determined that construction would have less than significant impacts on police, fire, or hazardous materials handling resources. Since the origin of construction labor workforce would not change (i.e., most construction workers would commute from Southern California to the project site on a work-week basis), impacts to schools and public services would continue to be less than significant. Similarly, any minor impacts on police, fire, or hazardous materials handling resources would be slightly reduced.

The Mitigated Ivanpah 3 arrangement would result in a reduction of more than 40,000 heliostats that would need to be washed bi-weekly. Hence, the Mitigation Proposal would also result in a slight reduction of the operational workforce.

The decrease in capital cost would result in a slight reduction in some of the economic benefits to San Bernardino and Clark counties resulting from a reduction of sales tax receipts for local purchases of materials and supplies, a reduction in induced and indirect economic impacts from fewer construction and operational jobs, and from a reduction in property taxes. Therefore, the Mitigated Ivanpah 3 would reduce the already less-than-significant impacts to schools and public services and would result in a slight reduction of some of the project's positive economic benefits. The proposed mitigation would not affect compliance with applicable LORS.

3.11 Soils and Water Resources

3.11.1 Soil Erosion Impacts

Reducing the size of Ivanpah 3 by 433 acres and removing 109 acres of the CLA from construction impacts would result in a decrease in the soil impacts previously analyzed. The portion of the CLA subject to construction impacts would be reduced from about 377 acres to about 268 acres, or about a 29 percent reduction.

Project impacts were previously determined to be less that significant. Compliance with applicable LORS would not change as a result of this Mitigation Proposal. As a result, any potential soils impacts associated with this proposal would decrease slightly and would remain less than significant. Updated water and wind erosion calculations (i.e., AFC Tables 5.11-3 and 5.11-5[7] have been revised) are included as Attachment B.

[7] These tables in the AFC were previously revised for the project "Optimization" (Data Response, Set 1D [Exhibit 7])

3.11.2 Waters of the State

Reducing the size of Ivanpah 3 by 433 acres and removing 109 acres of the CLA from construction impacts would result in a decrease of more than 12 percent in the extent of Waters of the State previously mapped. Total area of Waters of the State within the project boundaries is reduced from approximately 198 to approximately 174 acres, and Table 3.11-1 summarizes these changes. The Applicant continues to dispute the Staff's assumption that all of the Water of the States are: (a) impacted and (b) lost such that they must be replaced with acquisition at a 1:1 ratio. Applicant will brief these issues, which cross over into proposed Biological Resources mitigation requests of Staff.[8] Project impacts and mitigation requirements that would be affected by a reduction in the amount of Waters of the State include:

- Any mitigation requirements that were based on impacts to Waters of the State would need to be reduced to reflect the reduction in State Waters potentially impacted within the revised project boundaries of Mitigated Ivanpah 3, as established as a result of detailed design.
- Project-related dredge/fill impacts to Waters of the State would be reduced by the Mitigated Ivanpah 3 design. In particular, avoiding some of the larger ephemeral washes completely avoids the need to grade and fill for crossings within those washes, since construction equipment would no longer need access and egress through them. The exact reduction in dredge and fill will be determined during detailed design.

TABLE 3.11-1
Revised Summary of Waters of the State Identified in the Project Study Area

Wash Category	Project Feature	Number of Washes[a]	Wash Length (feet)	Wash Acreage[b]
Category 1 (36-85 feet)	Ivanpah 1	0	0	0.00
	Ivanpah 2	2	7,580	10.78
	Ivanpah 3	1	1,515	2.16
	Utility Corridor	0	0	0.00
	Colosseum Road	0	0	0.00
	Construction Logistics Area	0	0	0.00
	Category 1 Total	**3**	**9,095**	**12.94**
Category 2 (21-35 feet)	Ivanpah 1	0	0	0.00
	Ivanpah 2	4	5,847	3.80
	Ivanpah 3	3	7,139	4.08
	Utility Corridor	1	1,833	1.18
	Colosseum Road	0	0	0.00
	Construction Logistics Area	0	0	0.00
	Category 2 Total	**8**	**14,819**	**9.06**

[8] Applicant will brief the issues related to State Waters as the Applicant continues to believe the project complies with all applicable LORS and results in no potentially significant impacts.

TABLE 3.11-1
Revised Summary of Waters of the State Identified in the Project Study Area

Wash Category	Project Feature	Number of Washes[a]	Wash Length (feet)	Wash Acreage[b]
Category 3 (11-20 feet)	Ivanpah 1	10	19,850	5.83
	Ivanpah 2	22	21,406	7.81
	Ivanpah 3	15	21,798	7.09
	Utility Corridor	8	3,483	1.26
	Colosseum Road	9	6,018	2.75
	Construction Logistics Area	10	8,363	2.51
	Category 3 Total	**74**	**80,918**	**27.25**
Category 4 (5-10 feet)	Ivanpah 1	95	103,016	23.42
	Ivanpah 2	130	110,544	25.13
	Ivanpah 3	107	110,164	23.65
	Utility Corridor	16	6,878	1.60
	Colosseum Road	11	3,589	0.84
	Construction Logistics Area	19	19,102	4.46
	Category 4 Total	**378**	**353,293**	**79.10**
Category 5 (1-4 feet)	Ivanpah 1	397	245,095	14.07
	Ivanpah 2	292	200,153	9.69
	Ivanpah 3	358	343,111	16.35
	Utility Corridor	29	20,051	1.40
	Colosseum Road	36	4,442	0.25
	Construction Logistics Area	151	79,285	3.83
	Category 5 Total	**1,263**	**892,137**	**45.59**
Waters of the State (Total of All Categories)		**1,726**	**1,350,262**	**173.94**

Notes:
[a] Number of washes is based on number of segments in each category mapped in each of the project areas.
[b] Acreage calculated using Wash Length and the median width of the category range.
No wetlands were observed within the entire project area.

3.11.3 Stormwater Impacts

Reducing the size of Ivanpah 3 by 433 acres and removing 109 acres of the CLA from construction impacts would result in reduced stormwater run-off. The majority of the area in Ivanpah 3 that would be removed from the project lies within an active alluvial fan that has been designated as the Gas Line Gulch fan (see attached Figure 3-4). The Gas Line Gulch fan has the largest tributary watershed of the alluvial fans affecting the project site. As a result, the Gas Line Gulch fan is subject to the highest potential flood flows and erosion, which is evidenced by the washes on this fan being the largest of any within the project area. Under the present alternative, of the 470 acres of the project that are within the Gas Line Gulch fan, only 135 acres would remain under the Mitigated Ivanpah 3 proposal. Of that remaining area, 90 percent is located on the east side of the project where the risk of erosion is much lower due to the flood flows spreading over a wider area.

Although the project's detailed design would account for variations in the potential flood flow and erosion across the project site, reducing the area of the project within the Gas Line

Gulch fan reduces the overall risk of damage or failure of the heliostat pylons and perimeter fencing to be constructed for the project.

Stormwater run-off within the remaining project boundary would be unchanged. Although stormwater modeling has demonstrated that the effects of the project on peak flood flows and runoff volume in the watershed would be less than significant, reducing the 1,837-acre size of Ivanpah 3 by 433 acres would produce a corresponding reduction in the potential increase in runoff volume from the project site. As a result of the reduction in size, any potential stormwater impacts would be further reduced.

Grading and Earthwork Impacts

The Mitigated Ivanpah 3 design reduces the need for grading and boulder removal within Ivanpah 3. This Mitigation Proposal would eliminate roughly 150 of the 170 acres (about 88 percent) that would otherwise need to be graded to allow equipment access and boulder clearing. The areas removed by the Mitigated Ivanpah 3 design contain the most challenging terrain in regards to equipment access and ephemeral wash crossings, and includes the highest concentration of large rocks that would need relocation. Hence, as a result of the proposed reduction in size, any potential grading impacts would be further reduced.

This Biological Mitigation Proposal would not affect compliance with applicable LORS, and any potential soil and water impacts associated with this Mitigated Ivanpah 3 design would be less than significant.

3.12 Traffic and Transportation

Reducing the size of Ivanpah 3 by 433 acres would result in a decrease in the Traffic and Transportation impacts previously analyzed. As a result of the reduction in size, there would be a slight reduction in the workforce (either in size or in duration, or both). Hence, any potential Traffic and Transportation construction impacts described in the Applicant's testimony [Exhibit 65] would be less than those analyzed. In addition, the reduction of the number of power towers from seven to three would mean a reduction of luminance or glare that, according to Commission Staff, could distract motorists.

In addition, the proposed mitigation would not affect compliance with applicable LORS. Consequently, any potential Traffic and Transportation impacts associated with this Biological Mitigation Proposal would be less than the significant with incorporation of the mitigation measures.

3.13 Visual Resources

The Mitigated Ivanpah 3 proposal has the potential to reduce the visual resources impacts during project construction. The Mitigated Ivanpah 3 could reduce the duration of the construction period from what was previously indicated, reducing the length of the period in which viewers would be exposed to construction activities.

From a project operation standpoint, revising the project description to reduce the project size would reduce the project's impacts on visual resources, particularly the impacts on views from the CEC's KOPs 9 (north of Ivanpah 3) and 10 (Benson Mine vicinity). In

addition, because the number of solar towers topped by receiver units at Ivanpah 3 have been reduced from five to only one, the potential for the receiver unit glare impacts to travelers on I-15 about which CEC staff has expressed concern, would be substantially reduced.

Figure 3-5 is a revised version of the viewshed map of the entire project area that depicts the new boundaries of Ivanpah 2 and 3; the change in the design of Ivanpah 3, with a single tower rather than five towers; and a revised delineation of the areas from which the scaled-back project would be visible. Figure 3-6 is a version of the viewshed analysis that focuses on the project site and its relationship to the Stateline Wilderness.

As review of Figure 3-6 indicates, the reduction of the area occupied by Ivanpah 3 would result in the northern boundary of Ivanpah 3 being pushed farther south, increasing the distance between it and the Stateline Wilderness to 1.57 miles at its closest point, with the closest power tower being more than 2 miles from the wilderness area boundary. With the reduction in the number of solar towers at Ivanpah 3 from five to one, the area from which the project has the potential to be visible would be less than under the present design. In fact, it would only be visible from less than 15 percent of the Stateline Wilderness. Review of Figure 3-5 indicates that because of the reduction in the area occupied by Ivanpah 3 on its northern and western sides, under the Mitigated Ivanpah 3 alternative, this unit at its closest point, would be 1.35 miles from the western boundary of the Mojave National Preserve; whereas, Ivanpah 1 would remain unchanged under the Mitigated Ivanpah 3 alternative, and would be located more than 3 miles from the Mojave National Preserve's eastern boundary.

As can be seen on Figures 3-5 and 3-6, under the Mitigated Ivanpah 3 alternative, the project would still be visible from both KOPs 9 and 10. However, the effect of the project on the views from these locations would be even less than before, reflecting the fact that the northern edge of Ivanpah 3 under the Mitigated Ivanpah 3 alternative would be farther from KOP 9 than before, that the project would occupy a smaller area and have more than 40,000 fewer heliostats, and that the total numbers of solar towers and associated receiver units would be reduced from 7 to 3.

Figure 3-7 is the revised simulation of the view from KOP 9 located on a hillside north of the project site. Review of this simulation of Mitigated Ivanpah 3, and comparison of it to Figure DR147-2 [Exhibit 22], which depicts the view as it would appear with the proposed project in place, makes it clear that under the Mitigated Ivanpah 3 alternative, the project's level of visual impact would be even lower than the impact that would have occurred with the present design, in that field of heliostats would be smaller and would be located farther away than would have been the case under the present design, and there would be fewer solar towers and receiver units in the view. Because the project would continue to be reasonably well integrated into the overall view, under the Mitigated Ivanpah 3 alternative, it would not dominate it, and would not substantially degrade its existing visual character and quality; hence, its visual impact on this view would continue to be less than significant.

Figure 3-8 is the revised simulation of the view from KOP 10, which is located on a difficult to access hillside above the Benson Mine. Review of this simulation, and comparison of it to Figure DR147-3 [Exhibit 22], which depicts the view as it would appear with the proposed project in place, makes it clear that the project's level of visual impact under the Mitigated

Ivanpah 3 alternative would be even lower than the impact that would have occurred with the present design in that heliostat field would be smaller and the number of solar towers and receiver units in the portion of the view captured by the simulation view would be reduced from six to two. Because the project would continue to be reasonably well integrated into the overall view under the Mitigated Ivanpah 3 alternative, it would not dominate it, and would not substantially degrade its existing visual character and quality; its visual impact on this view would continue to be less than significant.

The Mitigated Ivanpah 3 alternative would not change the previous conclusions regarding compliance with existing LORS and with the reduced footprint and the reduction of the Ivanpah 3 towers from five towers to one, the beneficial effects on travelers along I-15 associated with fewer towers and a reduced footprint, and the Mitigated Ivanpah 3 design increasing the distance between the project and the Stateline Wilderness Area and the Mojave Preserve, the potential impacts are less than significant.[9]

3.14 Waste Management

Reducing the size of Ivanpah 3 by 433 acres and removing 109 acres of the CLA from construction impacts would result in a slight reduction in construction waste volume. As a result, any potential waste management impacts analyzed in the AFC and other documents would be reduced. In addition, the proposed mitigation would not affect compliance with applicable LORS. Consequently, any potential waste management impacts associated with this Biological Mitigation Proposal would be less than significant.

3.15 Worker Safety and Fire Protection

Because the safety plans and programs that will be developed for the project's construction and operation would still be prepared, the proposed mitigation would not change the Worker Health and Safety section of the AFC or the FSA/DEIS, nor would it affect compliance with applicable LORS. As a result, any potential Worker Health and Safety impacts associated with this Biological Mitigation Proposal would be less than significant.

3.16 Cumulative Impacts

Revising the project description to reduce the project size through the Mitigated Ivanpah 3 design would reduce potential Cumulative Impacts. As a result of the reduction in size, any potential cumulative impacts would be reduced. In addition, the proposed mitigation would not affect compliance with applicable LORS. Consequently, any potential cumulative impacts associated with this Biological Mitigation Proposal would be less than those analyzed in the FSA/DEIS.[10]

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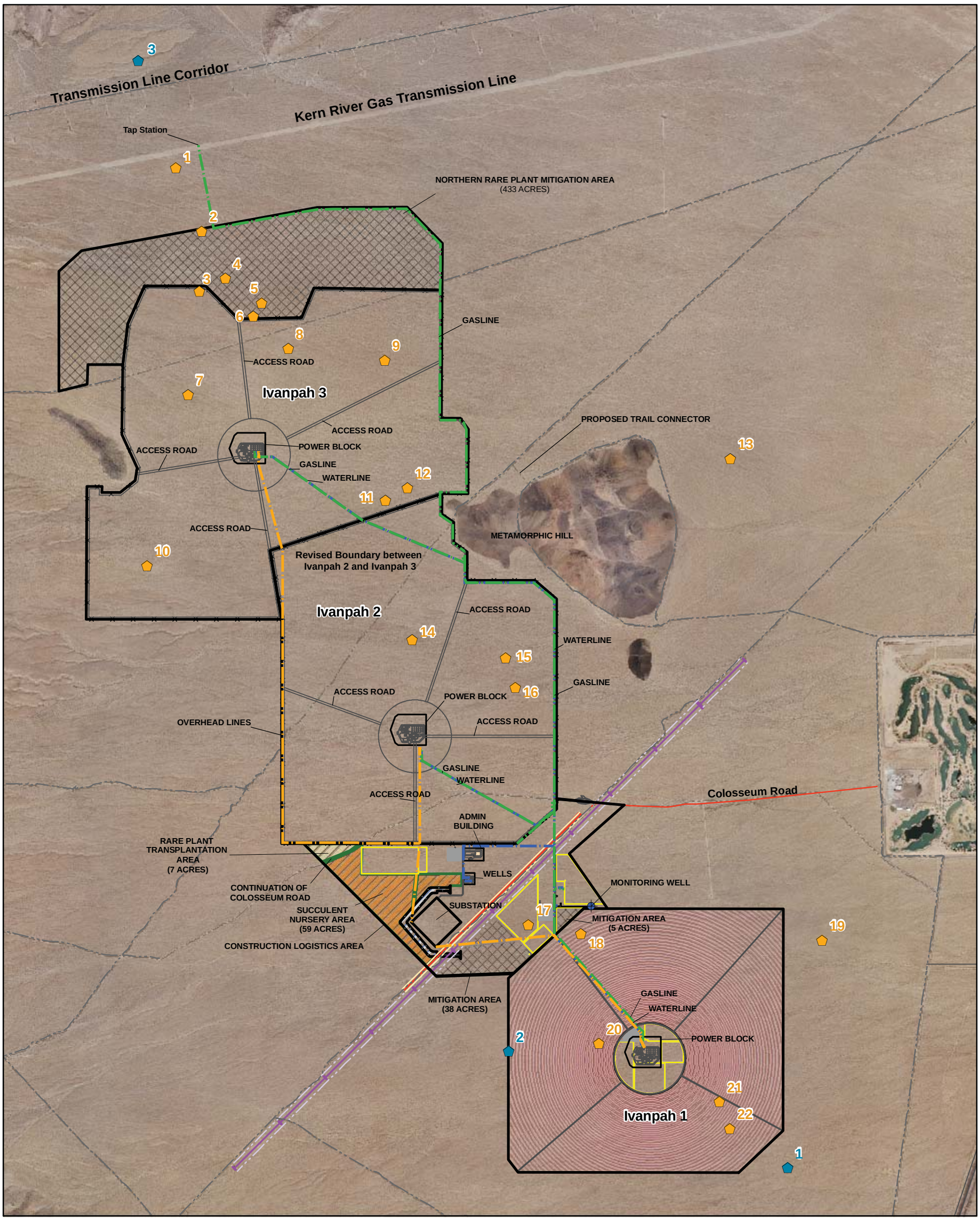
[9] Applicant will brief the issues related to LORS compliance and the Staff's impacts findings as the Applicant continues to believe the project complies with all applicable LORS and results in no potentially significant impacts.

[10] A proper cumulative impacts analysis includes, among other things, (1) clear identification of past, present and reasonably foreseeable projects, (2) an individual determination for every such cumulative project that any such future projects are in fact "reasonably foreseeable", and (3) a showing for each individual project that the impacts of the Ivanpah project and the cumulative project or projects identified will "combine" to create a significant cumulative effect. There are no remaining factual

3.17 Laws, Ordinances, Regulations and Standards

As described in each discipline area, this Mitigation Proposal would not alter the assumptions or conclusions made in the Applicant's testimony about compliance with current LORS.

issues associated with cumulative impacts, and, per the Committee's direction, Applicant will brief the issues related to proper scope of cumulative impacts.



LEGEND

- Wells

Desert Tortoise Survey Results

- Location of Live Desert Tortoise (2007)
- Location of Live Desert Tortoise (2008)

Heliostat Features

- Heliostat Maintenance Paths
- Heliostat Arrays

Main Utility Features

- Proposed Overhead Line
- Proposed Gas Line (50-foot Corridor)
- Proposed Water Line
- Facility Areas
- Existing 500 KV Line
- Existing 115 KV Line

Project Roads

- Proposed Dirt Roads
- Proposed Gravel Road
- Proposed Paved Road
- Trails

Site Features

- Proposed Fence
- Diversion Chanel
- Rare Plant Transplantation Area
- Succulent Nursery
- Rare Plant Mitigation Area

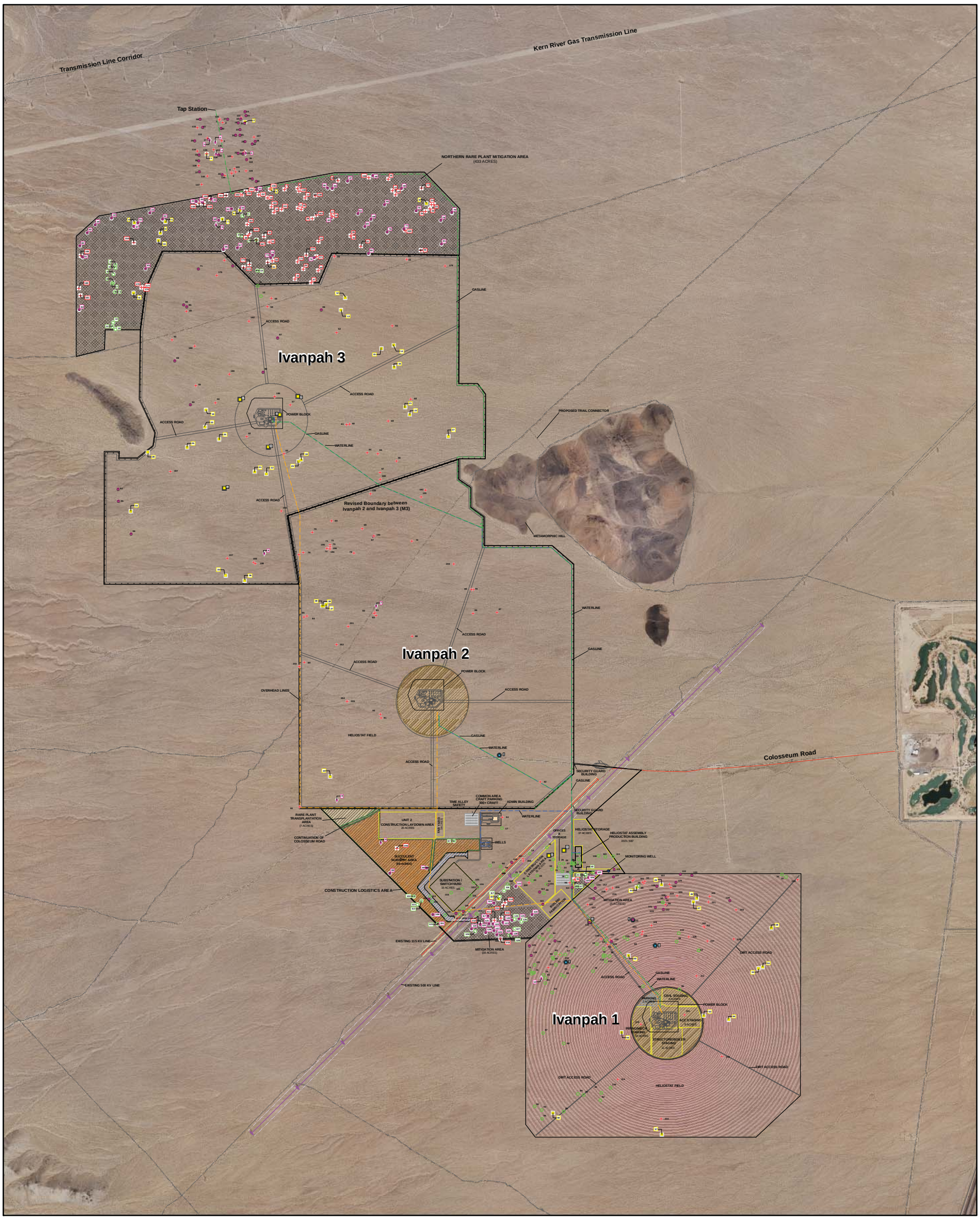
N

0 1,500 3,000
Feet

Notes:
1. Design pending for Ivanpah 3 / Ivanpah 2 heliostats arrays.
2. Carcasses, burrows, and other desert tortoise finds are not included on this map.
3. Site feature acreages rounded to nearest whole number.
4. Map Revised 02/08/2010.

Figure 3-1
Desert Tortoise Locations and New Ivanpah Layout
Ivanpah Solar Electric Generating System

CH2MHILL



LEGEND

Wells

Rare Plant Data

- 48 Mojave milkweed (*Asclepias nyctaginifolia*)
- 45 Parish's club cholla (*Grusonia (=Opuntia) parishii*)
- 215 Desert pincushion (*Coryphantha chlorantha*)
- 99 Nine-awned pappus grass (*Enneapogon desvauxii*)
- 4 Small-flowered androstephium (*Androstephium breviflorum*)

Avoided	Salvaged	
41	33	Mojave milkweed (*Asclepias nyctaginifolia*)
10		Parish's club cholla (*Grusonia (=Opuntia) parishii*)
32		Desert pincushion (*Coryphantha chlorantha*)
9		Rusby's desert mallow (*Sphaeralcea rusbyi var. eremicola*)
	4	Small-flowered androstephium (*Androstephium breviflorum*)

Heliostat Features
- Heliostat Maintenance Paths
- Heliostat Arrays

Main Utility Features
- Proposed Overhead Line
- Proposed Gas Line (50-foot Corridor)
- Proposed Water Line
- Facility Areas
- Existing 500 KV Line
- Existing 115 KV Line

N

0 1,500 3,000
Feet

Project Roads
- Proposed Dirt Roads
- Proposed Gravel Road
- Proposed Paved Road
- Trails

Site Features
- Proposed Fence
- Diversion Chanel
- Rare Plant Transplantation Area
- Succulent Nursery
- Rare Plant Mitigation Area
- Proposed Limit of Rough Grading

Notes:
1. Rare plant localities within the Ivanpah 1, 2 and 3 sites and the construction logistics area to be avoided will be protected during construction.
2. Design pending for Ivanpah 3 / Ivanpah 2 powerblocks, heliostat arrays and utilities.
3. Site feature acreages rounded to nearest whole number.
4. Map Revised 02/08/2010.

Figure 3-2
Rare Plant Direct Impact Avoidance Areas
Ivanpah Solar Electric Generating System

CH2MHILL

LEGEND

Trails

Rare Plant Mitigation Area

Project Boundary

N

0 1,500 3,000
Feet

Figure 3-3
Ivanpah Trails
Ivanpah Solar Electric Generating System

CH2MHILL

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N:\Clients\351 BrightSource Energy\00-09-02 Ivanpah Continuing General Consulting\GIS\Figures\Copy of Figure2_Active Fans with new Iv3 bndry v2.mxd 2/2/2010

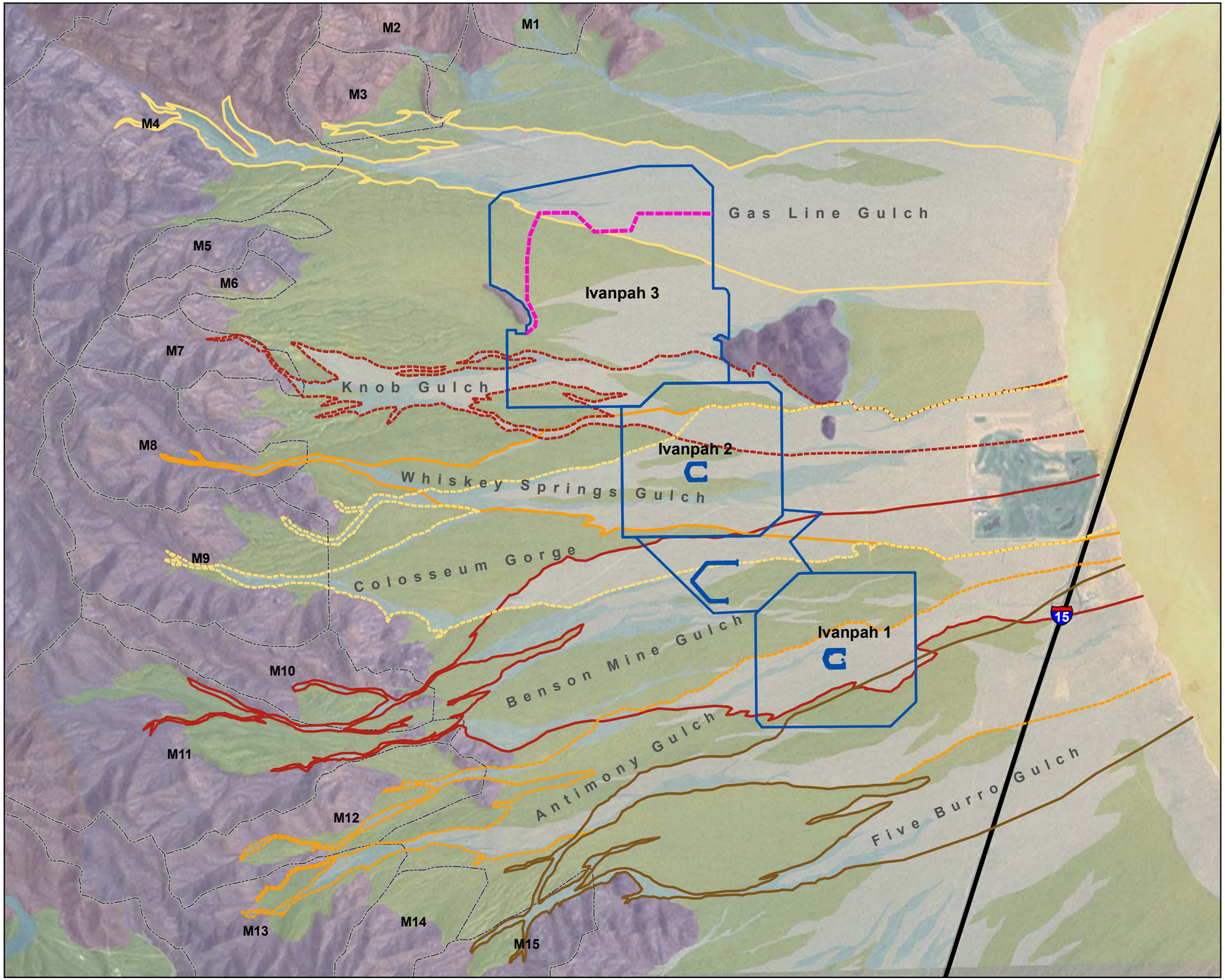

FIGURE 3-4

BrightSource Energy

Ivanpah Solar Electric Generating System

Estimated Extents of Active Alluvial Fan Channels

N

0 2,000 4,000

Scale in Feet

Notes

1. Extents are estimated based on geomorphological evidence obtained from literature review, digital elevation models, aerial photography, and field visits conducted under this effort.
2. Field visits were conducted January 6 - January 8, 2009, March 17 - March 19, 2009, and December 10 - December 12, 2009.
3. Extent names are informal designations for identification purposes.
4. References:
   1. Schmidt, K.M. and M. McMackin, 2006, Preliminary Surficial Geologic Map of the Mesquite Lake 30' X 60' Quadrangle, California and Nevada, U. S. Geological Survey Open-File Report 2006-1035.
   2. 1/3 Arcsecond Digital Elevation Model (10 meter DEM). U. S. Geological Survey, 2007, National Elevation Dataset (NED): http://seamless.usgs.gov/
   3. Declassified Satellite Imagery, 1970, U. S. Geological Survey.
   4. I3 Imagery Prime World (2D), 2009, ESRI ArcGIS Online: http://services.arcgisonline.com/v92

LEGEND

- Original Ivanpah SEGS Boundary
- Proposed Ivanpah SEGS North Boundary
- HEC-1 Watershed Boundary

WEST YOST ASSOCIATES
Consulting Engineers

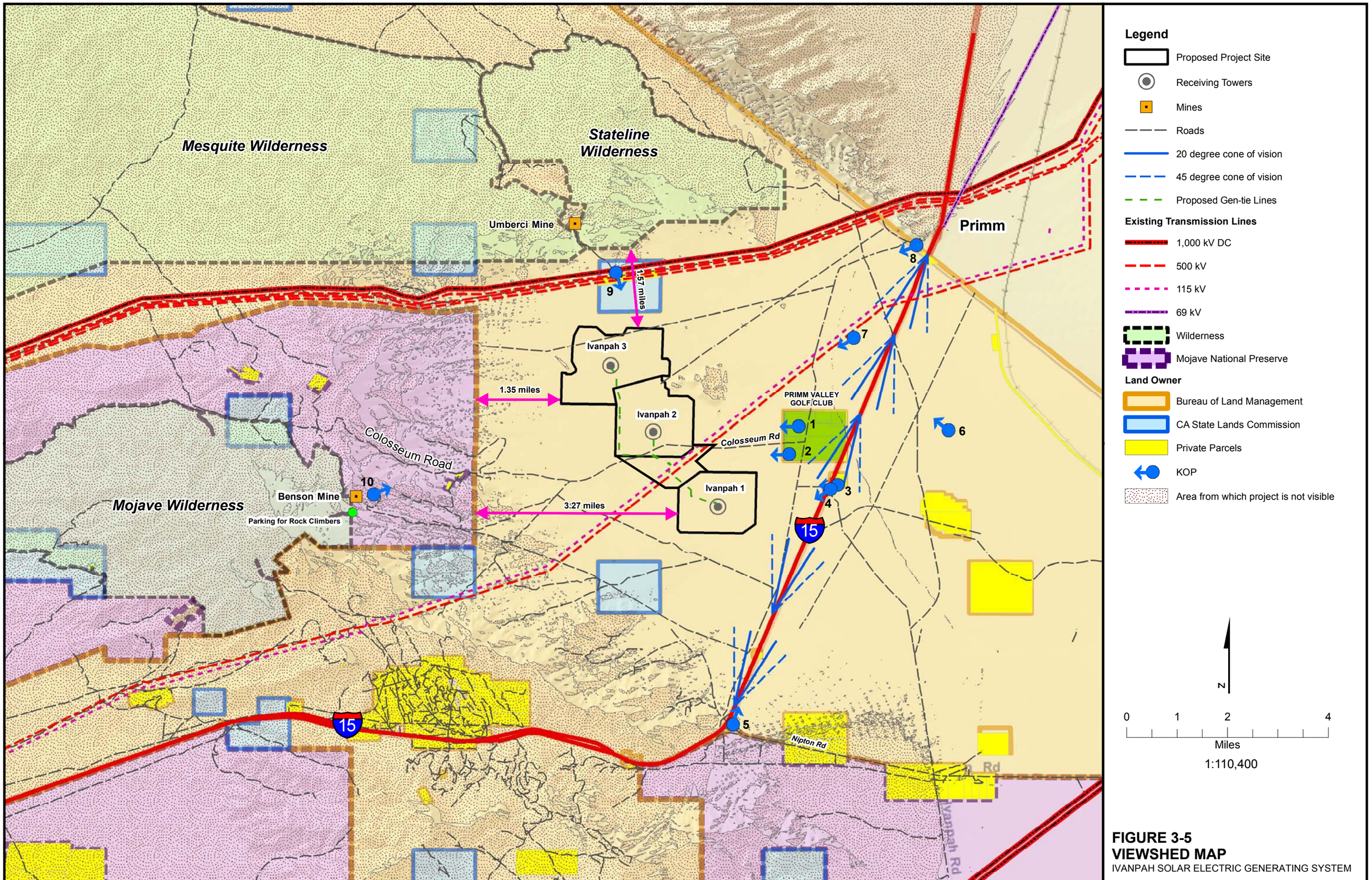

FIGURE 3-5
VIEWSHED MAP
IVANPAH SOLAR ELECTRIC GENERATING SYSTEM

\\MNBAOLXP322331\PROJECTS\BSE\MAPFILES\VIEWSHED_DEC09_11X17_V2.MXD CARCHER 1/29/2010 18:47:31
ES062007009SAC Figure_3-5.ai 02.11.2010 tdaus

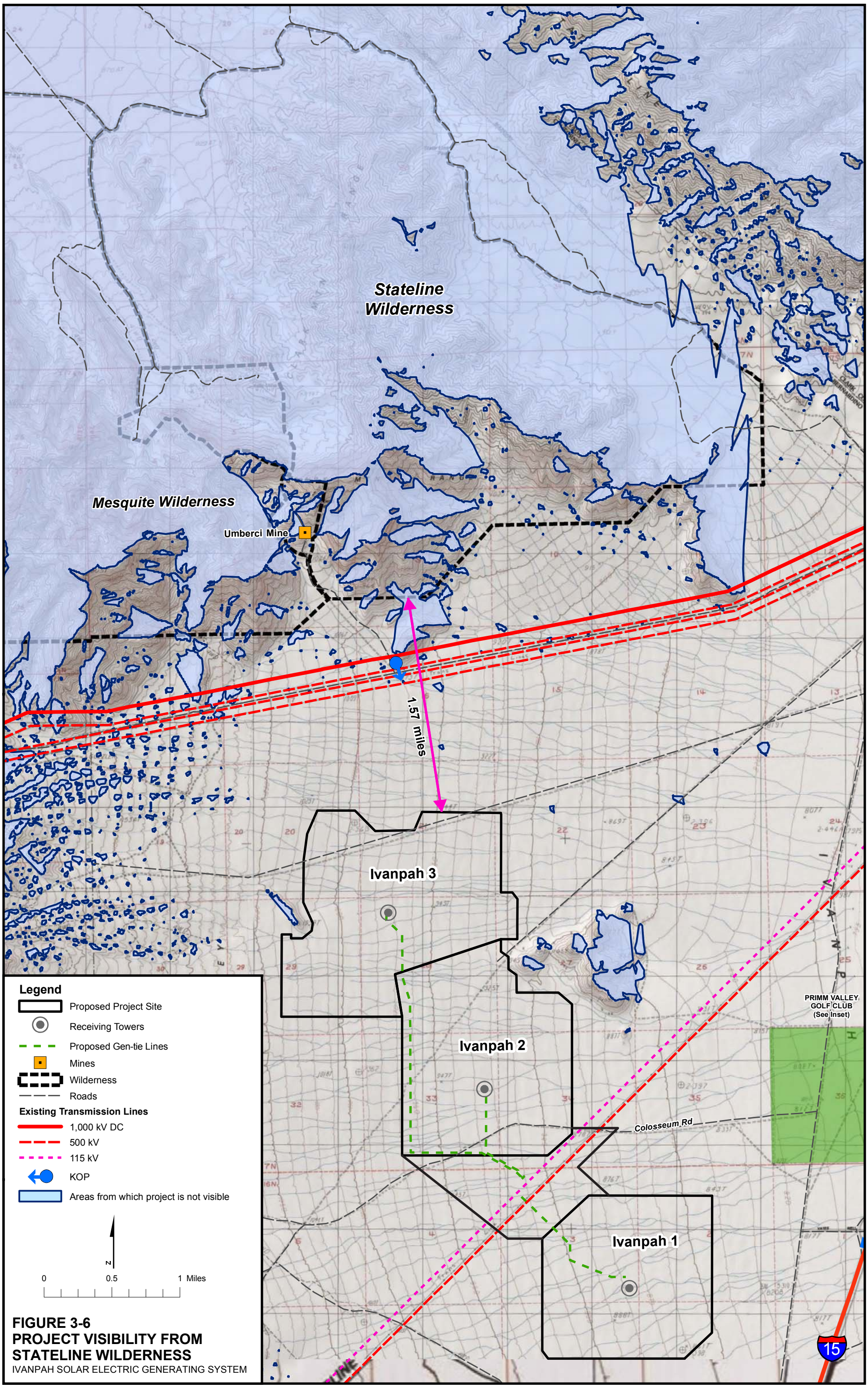

FIGURE 3-6
PROJECT VISIBILITY FROM STATELINE WILDERNESS
IVANPAH SOLAR ELECTRIC GENERATING SYSTEM

\\MNBAOLXP322331\PROJECTS\BSE\MAPFILES\VIEWSHED_DEC09_11X17_STATELINE_WILDERNESS.MXD CARCHER 1/29/2010 19:19:51
ES062007009SAC Figure_3-6.ai 02.11.2010 tdaus

FIGURE 3-7
UMBERCI MINE SIMULATED PROJECT VIEW (KOP 9)
IVANPAH SOLAR ELECTRIC GENERATING SYSTEM

CH2MHILL

ES062007009SAC Figure_3-8.ai 02.05.2010 tdaus

FIGURE 3-8
BENSON MINE SIMULATED PROJECT VIEW (KOP 10)
IVANPAH SOLAR ELECTRIC GENERATING SYSTEM

CH2MHILL

ES062007009SAC Figure_3-7.ai 02.05.2010 tdaus

Attachment A
Air Emission Tables

ATTACHMENT A

Air Emission Tables

The following tables (revised from those presented in the AFC) also include the following refinements associated with Mitigated Ivanpah 3:

- Emergency engines will be tested for no more than 30 minutes per day (the emissions in the AFC incorrectly reflect 60 minutes per day)
- Annual average emission rates (expressed in lb/hr) for the boilers have been revised in Table 5.1D-2R.

TABLE 5.1-14R
Natural Gas Boiler Specifications (Revised February 9, 2010)

	Ivanpahs 1 ~~&~~, 2 & 3	Ivanpah 3
Make and model	Nebraska boiler D-type NSX-G-120 or equivalent	Babcock Wilcox or equivalent
Fuel	Natural gas	Natural gas
Maximum boiler heat input rate	231.1 MMBtu/hr @ HHV	462.2 MMBtu/hr @ HHV
Steam production rate	220,000 lb/hr	440,000 lb/hr
Stack exhaust temperature	430°F	430°F
Exhaust flow rate	78,538 acfm	157,076 acfm
Exhaust O_2 concentration, dry volume	2.80%	2.80%
Exhaust CO_2 concentration, dry volume	10.28%	10.28%
Exhaust moisture content, wet volume	17.58%	17.58%
Emission controls	Low-NOx Burner (9.0 ppmvd NOx @ 3% O_2); combustion controls (4.0 ppmv CO; 2.0 ppmv VOC @ 3% O_2)	

TABLE 5.1-16R
Maximum Facility Fuel Use (Boilers) (MMBtu) (Revised February 9, 2010)[a]

Period	Ivanpah 1 &2 (each)	Ivanpah 3	Total Fuel Use
Per hour	231	~~462~~ 231	~~924~~ 693
Per day	924	1,848 924	~~3,696~~ 2,772
Per year	120,000	240,000 120,000	~~480,000~~ 360,000

Notes:

MMBtu = million British thermal units

TABLE 5.1-17R
Maximum Hourly Emission Rates: Boilers (Revised February 9, 2010)

Pollutant	ppmvd @ 3% O_2	lb/MMBtu	lb/hr
Ivanpah 1, ~~&~~ 2 &3 (each)			
NOx	9.0	0.011	2.5
SO_2[a]	1.7	0.003	0.6
CO	25.0	0.018	4.2
VOC	1.4	0.0006	0.1
PM_{10}	n/a	0.007	1.7
Ivanpah 3			
NOx	9.0	0.011	5.0
SO_2*	1.7	0.003	1.3
CO	25.0	0.018	8.5
VOC	1.4	0.0006	0.3
PM_{10}	n/a	0.007	3.4

* Based on maximum natural gas sulfur content of 0.75 grains/100 scf.

TABLE 5.1-18R
Maximum Emissions from New Equipment (Revised February 9, 2010)

	Pollutant				
Emissions/Equipment	**NOx**	**SO_2**	**CO**	**VOC**	**PM_{10}**
Maximum Hourly Emissions					
Boilers	10.0 7.5	2.6 1.9	16.9 12.7	0.5 1.5	6.8 5.1
Emergency Engines	41.8 20.9	0.1 0.0	6.8 1.7	1.7 0.4	0.6 0.2
Diesel Fire Pump Engines	0.0	0.0	0.0	0.0	0.0
Total, pounds per hour	**51.8 28.4**	**2.7 1.9**	**23.5 14.4**	**2.2 1.9**	**7.4 5.3**
Maximum Daily Emissions					
Boilers	40.0 30	10.3 7.8	67.7 50.7	2.2 1.5	27.4 20.4
Emergency Engines	167.0 62.7	0.1 0.2	13.5 5.1	3.3 1.2	1.2 0.6
Diesel Fire Pump Engines	7.0	0.0	1.0	0.8	0.1
Total, pounds per day	**214.0 99.7**	**10.4 8.0**	**82.2 56.8**	**6.3 3.5**	**28.7 21.1**
Maximum Annual Emissions					
Boilers	2.6 1.8	0.7 0.6	4.4 3.3	0.1 0.1	1.8 1.3
Emergency Engines	4.2	0.3	0.3	0.1	0.0
Diesel Fire Pump Engines	0.2	0.0	0.0	0.0	0.0
Total, tons per year	**~~7.0~~ 6.2**	**1.0 0.9**	**4.7 3.6**	**0.2 0.2**	**1.8 1.3**

TABLE 5.1B-2R
Emergency Engine Emissions and Operating Parameters (amended February 9, 2010)

Caterpillar 3516C-HD TA Diesel-Fired Emergency Generator Engine

2,500	ekW output	Stack Data	
1.341	HP/Btu	921.90	°F
9.4%	efficient system	1.5	ft diameter
3,750	HP each	30	ft height
1	hour/day	19,048.70	acfm
50	hours/year	179.66	ft/s
173.30	gallons/hour	54.8	m/s
0.139	MMBtu/gal	122.5	mph

Pollutant	Emission Factor (lb/HP-hr)	g/HP-hr	Ref	Emission Rate (lb/hr)	lb/day[a]	tons/yr
NO_x		5.1	Caterpillar[b]	~~41.75~~ 20.88	~~41.75~~ 20.88	1.044
CO		0.41		~~3.39~~ 1.70	~~3.39~~ 1.70	0.085
VOC		0.10		~~0.83~~ 0.42	~~0.83~~ 0.42	0.021
PM_{10}		0.036		~~0.30~~ 0.15	~~0.30~~ 0.15	0.007
SO_2	0.0000099	0.00451	15 ppmw S	~~0.037~~ 0.02[c]	~~0.037~~ 0.02	0.00093

[a] Peak daily emission rate (assumes 30 minutes of testing per day, total of 50 hours per year per engine).

[b] Caterpillar 3516C-HD (Tier 2).

[c] Assumes SPECIFIC GRAVITY OF DIESEL FUEL = 0.86

TABLE 5.1B-4R (Revised February 9, 2010)

Detailed Calculations for Hourly, Daily, And Annual Operating Emissions (Boilers)

	NOx			SOx			CO			VOC			PM10/PM2.5		
Equipment	**Max lb/hr**	**Max lb/day**	**Total tpy**	**Max lb/hr**	**Max lb/day**	**Total tpy**	**Max lb/hr**	**Max lb/day**	**Total tpy**	**Max lb/hr**	**Max lb/day**	**Total tpy**	**Max lb/hr**	**Max lb/day**	**Total tpy**
Ivanpah 1	2.5	10.0	0.6	0.6	2.6	0.2	4.2	16.9	1.1	0.1	0.5	0.0	1.7	6.8	0.4
Ivanpah 2	2.5	10.0	0.6	0.6	2.6	0.2	4.2	16.9	1.1	0.1	0.5	0.0	1.7	6.8	0.4
Ivanpah 3	2.5	10.0	0.6	0.6	2.6	0.2	4.2	16.9	1.1	0.1	0.5	0.0	1.7	6.8	0.4
	~~5.0~~	~~20.0~~	~~1.3~~	~~1.3~~	~~5.1~~	~~0.3~~	~~8.5~~	~~33.8~~	~~2.2~~	~~0.3~~	~~1.1~~	~~0.1~~	~~3.4~~	~~13.7~~	~~0.9~~
Total	**7.5**	**30.0**	**1.8**	**1.8**	**7.8**	**0.6**	**12.6**	**50.7**	**3.3**	**0.4**	**1.5**	**0.1**	**5.1**	**20.4**	**1.3**
	~~10.0~~	**~~40.0~~**	**~~2.6~~**	**~~2.6~~**	**~~10.3~~**	**~~0.7~~**	**~~16.9~~**	**~~67.7~~**	**~~4.4~~**	**~~0.5~~**	**~~2.2~~**	**~~0.1~~**	**~~6.8~~**	**~~27.4~~**	**~~1.8~~**

Notes:

Daily emissions based on 4 hours per day.

Annual emissions based on fuel use = 5% of solar input (120,000 MMBtu).

TABLE 5.1D-2R
Emission Rates and Stack Parameters for Refined Modeling (Revised February 9, 2010)

Equipment	Stack Diameter (m)	Stack Height (m)	Temp (deg K)	Exhaust Flow (m^3/s)	Exhaust Velocity (m/s)	Emission Rates(g/s) NOx	SOx	CO	PM_{10}	Stack Diameter (ft)	Stack Height (ft)	Exhaust Temp (°F)	Exhaust Flow Rate (ft^3/min)	Exhaust Velocity (ft/s)	Emission Rates (lb/hr) NOx	SOx	CO	PM10
Averaging Period: 1-hour																		
Ivanpah 1 Boiler	1.02	39.62	494.26	37.07	45.72	0.3152	0.0811	0.5330	0.2155	3.3	130	430	78,538	150	2.50	0.64	4.23	1.71
Ivanpah 1 Emergency Engine	0.46	9.15	767.54	8.99	54.76	~~5.2605~~ 2.6303	~~0.0047~~ 0.0023	~~0.4271~~ 0.2136	~~0.0375~~ 0.0189	1.5	30	922	19,049	180	~~41.75~~ 20.88	~~0.04~~ 0.02	~~3.39~~ 1.70	~~0.30~~ 0.15
Ivanpah 1 Fire Pump	0.15	6.10	726.48	0.70	38.39	0.2940	0.0003	0.0407	0.0060	0.5	20	848	1,484	126	2.33	0.00	0.32	0.05
Ivanpah 2 Boiler	1.02	39.62	494.26	37.07	45.72	0.3152	0.0811	0.5330	0.2155	3.3	130	430	78,538	150	2.50	0.64	4.23	1.71
Ivanpah 2 Emergency Engine	0.46	9.15	767.54	8.99	54.76	~~5.2605~~ 2.6303	~~0.0047~~ 0.0023	~~0.4271~~ 0.2136	~~0.0375~~ 0.0189	1.5	30	922	19,049	180	~~41.75~~ 20.88	~~0.04~~ 0.02	~~3.39~~ 1.70	~~0.30~~ 0.15
Ivanpah 2 Fire Pump	0.15	6.10	726.48	0.70	38.39	0.2940	0.0003	0.0407	0.0060	0.5	20	848	1,484	126	2.33	0.00	0.32	0.05
Ivanpah 3 Boiler	~~1.52~~ 1.02	39.62	494.26	~~74.13~~ 37.07	~~40.64~~ 45.72	~~0.6304~~ 0.3152	~~0.1622~~ 0.0811	~~1.0661~~ 0.5330	~~0.4309~~ 0.2155	~~5.0~~ 3.3	130	430	~~157,076~~ 78,538	~~133~~ 150	~~5.00~~ 2.50	~~1.29~~ 0.64	~~8.46~~ 4.23	~~3.42~~ 1.71
Ivanpah 3 Emergency Engine~~A~~	0.46	9.15	767.54	8.99	54.76	~~5.2605~~ 2.6303	~~0.0047~~ 0.0023	~~0.4271~~ 0.2136	~~0.0375~~ 0.0189	1.5	30	922	19,049	180	~~41.75~~ 20.88	~~0.04~~ 0.02	~~3.39~~ 1.70	~~0.30~~ 0.15
~~Ivanpah 3 Emergency Engine B~~	~~0.46~~	~~9.15~~	~~767.54~~	~~8.99~~	~~54.76~~	~~5.2605~~	~~0.0047~~	~~0.4271~~	~~0.0375~~	~~1.5~~	~~30~~	~~922~~	~~19,049~~	~~180~~	~~41.75~~	~~0.04~~	~~3.39~~	~~0.30~~
Ivanpah 3 Fire Pump	0.15	6.10	726.48	0.70	38.39	0.2940	0.0003	0.0407	0.0060	0.5	20	848	1,484	126	2.33	0.00	0.32	0.05
Averaging Period: 3-hour																		
Ivanpah 1 Boiler	1.02	39.62	494.26	37.07	45.72	0.3152	0.0811	0.5330	0.2155	3.3	130	430	78,538	150	2.50	0.64	4.23	1.71
Ivanpah 1 Emergency Engine	0.46	9.15	767.54	8.99	54.76	~~1.7535~~ 0.8768	~~0.0016~~ 0.0008	~~0.1424~~ 0.0712	~~0.0125~~ 0.0063	1.5	30	922	19,049	180	~~13.92~~ 6.96	~~0.01~~ 0.01	~~1.13~~ 0.57	~~0.10~~ 0.05
Ivanpah 1 Fire Pump	0.15	6.10	726.48	0.70	38.39	0.0980	0.0001	0.0136	0.0020	0.5	20	848	1,484	126	0.78	0.00	0.11	0.02
Ivanpah 2 Boiler	1.02	39.62	494.26	37.07	45.72	0.3152	0.0811	0.5330	0.2155	3.3	130	430	78,538	150	2.50	0.64	4.23	1.71
Ivanpah 2 Emergency Engine	0.46	9.15	767.54	8.99	54.76	~~1.7535~~ 0.8768	~~0.0016~~ 0.0008	~~0.1424~~ 0.0712	~~0.0125~~ 0.0063	1.5	30	922	19,049	180	~~13.92~~ 6.96	~~0.01~~ 0.01	~~1.13~~ 0.57	~~0.10~~ 0.05
Ivanpah 2 Fire Pump	0.15	6.10	726.48	0.70	38.39	0.0980	0.0001	0.0136	0.0020	0.5	20	848	1,484	126	0.78	0.00	0.11	0.02
Ivanpah 3 Boiler	~~1.52~~ 1.02	39.62	494.26	~~74.13~~ 37.07	~~40.64~~ 45.72	~~0.6304~~ 0.3152	~~0.1622~~ 0.0811	~~1.0661~~ 0.5330	~~0.4309~~ 0.2155	~~5.0~~ 3.3	130	430	~~157,076~~ 78,538	~~133~~ 150	~~5.00~~ 2.50	~~1.29~~ 0.64	~~8.46~~ 4.23	~~3.42~~ 1.71
Ivanpah 3 Emergency Engine	0.46	9.15	767.54	8.99	54.76	~~1.7535~~ 0.8768	~~0.0016~~ 0.0008	~~0.1424~~ 0.0712	~~0.0125~~ 0.0063	1.5	30	922	19,049	180	~~13.92~~ 6.96	~~0.01~~ 0.01	~~1.13~~ 0.57	~~0.10~~ 0.05
~~Ivanpah 3 Emergency Engine~~	~~0.46~~	~~9.15~~	~~767.54~~	~~8.99~~	~~54.76~~	~~1.7535~~	~~0.0016~~	~~0.1424~~	~~0.0125~~	~~1.5~~	~~30~~	~~922~~	~~19,049~~	~~180~~	~~13.92~~	~~0.01~~	~~1.13~~	~~0.10~~
Ivanpah 3 Fire Pump	0.15	6.10	726.48	0.70	38.39	0.0980	0.0001	0.0136	0.0020	0.5	20	848	1,484	126	0.78	0.00	0.11	0.02

TABLE 5.1D-2R
Emission Rates and Stack Parameters for Refined Modeling (Revised February 9, 2010)

Equipment	Stack Diameter (m)	Stack Height (m)	Temp (deg K)	Exhaust Flow (m^3/s)	Exhaust Velocity (m/s)	Emission Rates(g/s) NOx	SOx	CO	PM_{10}	Stack Diameter (ft)	Stack Height (ft)	Exhaust Temp (°F)	Exhaust Flow Rate (ft^3/min)	Exhaust Velocity (ft/s)	Emission Rates (lb/hr) NOx	SOx	CO	PM10
Averaging Period: 8-hour																		
Ivanpah 1 Boiler	1.02	39.62	494.26	37.07	45.72	0.1576	0.0405	0.2665	0.1077	3.3	130	430	78,538	150	1.25	0.32	2.12	0.86
Ivanpah 1 Emergency Engine	0.46	9.15	767.54	8.99	54.76	~~0.2192~~ 0.1096	~~0.0002~~ 0.0001	~~0.0178~~ 0.0089	~~0.0016~~ 0.0008	1.5	20	922	19,049	180	~~1.74~~ 0.87	~~0.00~~ 0.00	~~0.14~~ 0.07	~~0.01~~ 0.01
Ivanpah 1 Fire Pump	0.15	6.10	726.48	0.70	38.39	0.0123	0.0000	0.0017	0.0003	0.5	20	848	1,484	126	0.10	0.00	0.01	0.00
Ivanpah 2 Boiler	1.02	39.62	494.26	37.07	45.72	0.1576	0.0405	0.2665	0.1077	3.3	130	430	78,538	150	1.25	0.32	2.12	0.86
Ivanpah 2 Emergency Engine	0.46	9.15	767.54	8.99	54.76	~~0.2192~~ 0.1096	~~0.0002~~ 0.0001	~~0.0178~~ 0.0089	~~0.0016~~ 0.0008	1.5	20	922	19,049	180	~~1.74~~ 0.87	~~0.00~~ 0.00	~~0.14~~ 0.07	~~0.01~~ 0.01
Ivanpah 2 Fire Pump	0.15	6.10	726.48	0.70	38.39	0.0123	0.0000	0.0017	0.0003	0.5	20	848	1,484	126	0.10	0.00	0.01	0.00
Ivanpah 3 Boiler	~~1.52~~ 1.02	39.62	494.26	~~74.13~~ 37.07	~~40.64~~ 45.72	~~0.3152~~ 0.1576	~~0.0811~~ 0.0405	~~0.5330~~ 0.2665	~~0.2155~~ 0.1077	~~5.0~~ 3.3	130	430	~~157,076~~ 78,538	~~133~~ 150	~~2.50~~ 1.25	~~0.64~~ 0.32	~~4.23~~ 2.12	~~1.71~~ 0.86
Ivanpah 3 Emergency Engine	0.46	9.15	767.54	8.99	54.76	~~0.2192~~ 0.1096	~~0.0002~~ 0.0001	~~0.0178~~ 0.0089	~~0.0016~~ 0.0008	1.5	20	922	19,049	180	~~1.74~~ 0.87	~~0.00~~ 0.00	~~0.14~~ 0.07	~~0.01~~ 0.01
~~Ivanpah 3 Emergency Engine~~	~~0.46~~	~~9.15~~	~~767.54~~	~~8.99~~	~~54.76~~	~~0.2192~~	~~0.0002~~	~~0.0178~~	~~0.0016~~	~~1.5~~	~~20~~	~~922~~	~~19,049~~	~~180~~	~~1.74~~	~~0.00~~	~~0.14~~	~~0.01~~
Ivanpah 3 Fire Pump	0.15	6.10	726.48	0.70	38.39	0.0123	0.0000	0.0017	0.0003	0.5	20	848	1,484	126	0.10	0.00	0.01	0.00
Averaging Period: Annual																		
Ivanpah 1 Boiler	1.02	39.62	494.26	37.07	45.72	0.0093	0.0024	0.0158	0.0064	3.3	130	430	78,538	150	~~1.25~~ 0.42	~~0.32~~ 0.10	~~2.12~~ 0.70	~~0.86~~ 0.28
Ivanpah 1 Emergency Engine	0.46	9.15	767.54	8.99	54.76	0.0000	0.0000	0.0000	0.0000	1.5	20	922	19,049	180	0.01	0.00	0.00	0.00
Ivanpah 1 Fire Pump	0.15	6.10	726.48	0.70	38.39	0.0000	0.0000	0.0000	0.0000	0.5	20	848	1,484	126	0.00	0.00	0.00	0.00
Ivanpah 2 Boiler	1.02	39.62	494.26	37.07	45.72	0.0093	0.0024	0.0158	0.0064	3.3	130	430	78,538	150	~~1.25~~ 0.42	~~0.32~~ 0.10	~~2.12~~ 0.70	~~0.86~~ 0.28
Ivanpah 2 Emergency Engine	0.46	9.15	767.54	8.99	54.76	0.0000	0.0000	0.0000	0.0000	1.5	20	922	19,049	180	0.01	0.00	0.00	0.00
Ivanpah 2 Fire Pump	0.15	6.10	726.48	0.70	38.39	0.0000	0.0000	0.0000	0.0000	0.5	20	848	1,484	126	0.00	0.00	0.00	0.00
Ivanpah 3 Boiler	~~1.52~~ 1.02	39.62	494.26	~~74.13~~ 37.07	~~40.64~~ 45.72	~~0.0187~~ 0.0093	~~0.0048~~ 0.0024	~~0.0316~~ 0.0158	~~0.0128~~ 0.0064	~~5.0~~ 3.3	130	430	~~157,076~~ 78,538	~~133~~ 150	~~2.50~~ 0.42	~~0.64~~ 0.10	~~4.23~~ 0.70	~~1.71~~ 0.28
Ivanpah 3 Emergency Engine	0.46	9.15	767.54	8.99	54.76	0.0000	0.0000	0.0000	0.0000	1.5	20	922	19,049	180	0.01	0.00	0.00	0.00
~~Ivanpah 3 Emergency Engine~~	~~0.46~~	~~9.15~~	~~767.54~~	~~8.99~~	~~54.76~~	~~0.0000~~	~~0.0000~~	~~0.0000~~	~~0.0000~~	~~1.5~~	~~20~~	~~922~~	~~19,049~~	~~180~~	~~0.01~~	~~0.00~~	~~0.00~~	~~0.00~~
Ivanpah 3 Fire Pump	0.15	6.10	726.48	0.70	38.39	0.0000	0.0000	0.0000	0.0000	0.5	20	848	1,484	126	0.00	0.00	0.00	0.00

Attachment B
Soil Loss Tables

TABLE 5.11-3R2
Estimate of Soil Loss by Water Erosion Using Revised Universal Soil Loss Equation (RUSLE2)
(Revised February 9, 2010)

			Estimates Using Revised Universal Soil Loss Equation[1]		
Feature (acreage)[2]	**Activity**	**Duration (months)**	**Soil Loss (tons) without BMPs**	**Soil Loss (tons) with BMPs**	**Soil Loss (tons/yr) No Project**
Ivanpah 1 (913.812 acres total; 690.28 acres to grade)	Grading	5	155.3	2.1	0.0088
	Construction	15	217.0	6.2	---
Ivanpah 2 (1,096.65 acres total; 1,088.31 acres to grade)	Grading	5	185.0	2.4	0.0104
	Construction	15	258.5	7.3	---
Ivanpah 3 (1,227.04 acres total; 917.67 acres to grade)	Grading	5	180.9	2.5	0.0238
	Construction	15	267.5	7.6	---
Substation and Storage/ Administration Buildings (22.15 and 2.64 = 24.79 acres)	Grading	1	1.797	0.018	0.00038
	Construction	3	1.897	0.054	---
Laydown Area (120 acres, remaining 257 acres is not included due to the low level of disturbance)	Grading	1	5.400	0.054	0.00115
	Construction	40	76.000	2.160	---
Roads and Trails (7.353 acres)	Grading	1.5	1.824	0.019	0.000377
	Construction	1	0.436	0.012	---
Gen-tie Lines (5.094 acres for construction; 0.0084 acre for pole footprints)	Grading	1	0.0002	0.000004	0.000000
	Construction	3	0.000	0.000	---
Water Line (2.702 acres for construction; 0.0135 acre for trench)	Grading	1	0.2624	0.00001	0.00006
	Construction	1	0.092	0.003	---
Gas Line Corridor (7.298 acres for construction; 0.584 acre for trench)	Grading	1	0.534	0.0003	0.00011
	Construction	3	0.563	0.016	---
Project Soil Loss Estimates	**Total**		**1,353.0**	**30.4**	**0.045**

Notes:

1. Soil losses (tons/acre/year) are estimated using RUSLE2 software available on line [http://fargo.nserl.purdue.edu/rusle2_dataweb/RUSLE2_index.htm].
   - The soil characteristics were estimated using RUSLE2 soil profiles corresponding to the mapped soil unit.
   - Soil loss (R-factors) were estimated using 2-year, 6-hour point precipitation frequency amount for the nearest National Weather Service station to the EEP site [on line at http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html].
   - Estimates of actual soil losses use the RUSLE2 soil loss times the duration and the affected area. The No Project Alternative estimate does not have a specific duration so loss is given as tons/year.
2. Acreages assume a 40-ft corridor for the access roadways and 50-ft corridors for the gas, water, and transmission line construction corridors. Outside of the project footprint, the gas line would have a 4-ft wide trench and the gen-tie lines would have poles every 750 with each pole having a 4 by 4-foot excavation footprint.

Other Project Assumptions as follows:

- About 75.5% of the entire ISEGS site would be disturbed.
- Overhead gen-tie lines would have 23 towers outside of project footprint. Each tower would have a 4- by 4-foot footprint.
- It is assumed that the grading/excavation for all the poles will be completed within 1 month and the entire installation will be completed within 3 months.
- It is assumed that grading for each site will take 5 months and construction will take 15 months according to construction schedule.
- It is assumed that grading for access roads will take 1.5 months and construction will take 1 additional month.
- It is assumed that grading for substation and storage and administration buildings will take 1 month and that construction will take an additional 3 months.
- It is assumed that grading of the active laydown area would take one month, then the site would be covered with temporary buildings and materials so soil loss would be negligible during a 40-month construction period (assumes Phase 1 and 2 done concurrently and Phase 3 done afterwards).
- It is assumed that the excavation for transmission poles and gas line trench would take 1 month each and that construction would take an additional 3 months.
- It is assumed that the excavation for water line trench would take 1 month each and that construction would take an additional 1 month.

RUSLE2 Assumptions as follows:

- 100-foot slope length. Estimated soil unit slope is the midpoint of the minimum and maximum of the unit slope class.

Construction soil losses assume the following inputs: Management - Bare ground; Contouring - None, rows up and down hill;

- Diversion/terracing - None; Strips and Barriers - None.

Grading soil losses assume the following inputs: Management - Bare ground/rough surface; Contouring - None, rows up and down hill:

- Diversion/terracing - None; Strips and Barriers - None.

Construction with BMP soil losses assume the following inputs: Management - Silt fence; Contouring - Perfect, no row grade:

- Diversion/terracing - None; Strips and Barriers - 2 fences, 1 at end of RUSLE slope.

No Project soil losses assume the following inputs: Management - Dense grass, not harvested; Contouring - None, rows up and down hill:

- Diversion/terracing - None; Strips and Barriers - None.

TABLE 5.11-5R2
Estimate of Total Suspended Particulates Emitted from Grading and Wind Erosion (Revised February 9, 2010)

Emission Source	Acreage	Duration (months)	Unmitigated TSP (tons)	Mitigated TSP (tons)
Grading Dust				
Project site (all three areas)	3,237.88	5	278.255	97.389
Substation and storage/admin buildings	39.94	1	0.686	0.240
Laydown area	120.00	1	2.063	0.722
Roads and trails	25.75	1.5	0.664	0.232
Gen-tie lines (poles)	0.0044	1	0.00008	0.00003
Water line (4-foot wide trench)	5.8315	1	0.10023	0.03508
Gas line (4-foot wide trench)	11.859	1	0.204	0.071
Wind Blown Dust				
Project site	2,919.71	15	138.686	48.540
Substation and storage/admin buildings	39.94	20	0.000	0.000
Laydown area	0.00	40	0.000	0.000
Roads and trails	25.75	1	0.082	0.029
Gen-tie line corridor	0.0044	3	0.000	0.000
Water line corridor	5.83	1	0.018	0.006
Gas line corridor	11.86	3	0.563	0.197
Estimated total			**421.3**	**147.5**

Note: All linear feature impacts noted above are for portions outside of the project areas footprints.

Project Assumptions:

- Grading for each site would be completed in a 5-month period and that between 75 to 99% of the area would be disturbed (depending on the unit).
- Construction on each of the three project areas would extend an additional 15 months after grading.
- Roadways would require 1.5 months for grading and additional 1 month to construct.
- Grading at the substation and storage and administrative building areas would take 1 month followed by 3-month construction period.
- Grading of active laydown area would take one month, then the site would be covered with temporary buildings and materials so dust emissions would be negligible during a 40-month construction period (assumes Phase 1 and 2 done concurrently and Phase 3 done afterwards).
- Excavation of transmission line pole holes and gas line trench would take 1 month followed by a 3-month construction period.
- The overhead gen-tie lines would have 23 new poles outside of the project footprint. Each pole would have a 4- by 4-foot area for a total impact permanent area of 0.008 acre.
- Approximately 1/10th of the project site, substation, and storage/administration building areas have bare soil exposure during the length of the construction period.
- Approximately half of the transmission line and gas line corridors areas has bare soil exposure during the length of the construction period.

Data Sources:

- PM10 Emission Factor Source: Midwest Research Institute, South Coast AQMD Project No. 95040, Level 2 Analysis Procedure, March 1996
- PM10 to TSP Conversion Factor Source: Bay Area Air Quality Management District CEQA Guidelines, Assessing the Air Quality Impacts of Projects, December 1999.
- SCAQMD CEQA Handbook (1993) Table 11-4 for mitigation efficiency rates (as summarized in Table 8.9-4)

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION OF THE STATE OF CALIFORNIA
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APPLICATION FOR CERTIFICATION FOR THE *IVANPAH SOLAR ELECTRIC GENERATING SYSTEM*

DOCKET NO. 07-AFC-5
PROOF OF SERVICE
(Revised 2/8/10)

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DECLARATION OF SERVICE

I, Mary Finn, declare that on February 11, 2010, I served and filed copies of the attached, 7afc5 02-11-10 Biological Mitigation Proposal Ivanpah 3 dated February 11, 2010. The original document, filed with the Docket Unit, is accompanied by a copy of the most recent Proof of Service list, located on the web page for this project at:
[www.energy.ca.gov/sitingcases/ivanpah].

The documents have been sent to both the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission's Docket Unit, in the following manner:

(Check all that Apply)

FOR SERVICE TO ALL OTHER PARTIES:

__x__ sent electronically to all email addresses on the Proof of Service list;

__x__ by personal delivery or by depositing in the United States mail at **Sacramento**** with first-class postage thereon fully prepaid and addressed as provided on the Proof of Service list above to those addresses **NOT** marked "email preferred."

AND

FOR FILING WITH THE ENERGY COMMISSION:

__x__ sending an original paper copy and one electronic copy, mailed and emailed respectively, to the address below (***preferred method***);

OR

_____ depositing in the mail an original and 12 paper copies, as follows:

CALIFORNIA ENERGY COMMISSION
Attn: Docket No. 07-AFC-5
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512
docket@energy.state.ca.us

I declare under penalty of perjury that the foregoing is true and correct.

Mary Finn

****or by other delivery service, e.g., Fed Ex, UPS, courier, etc.**