
*Attachment DR19-1B
Revised Draft*

**Delineation of Waters of the
United States for the Ivanpah
Solar Energy Project:
Eastern San Bernardino County,
California**

Prepared for
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Acronyms and Abbreviations

°F	degree(s) Fahrenheit
CDFG	California Department of Fish and Game
GIS	geographic information system
kV	kilovolt
LLC	Limited Liability Corporation
MW	megawatt
NRCS	Natural Resource Conservation Service
SEGS	Solar Electric Generating System
TNW	traditional navigable water
U.S.	United States
USACE	United States Army Corps of Engineers
USGS	United States Geological Survey
YR	yellow-red Munsell® color designation

Introduction

This report presents the findings of a Waters and Wetland Delineation for Bright Source Energy's proposed Ivanpah Solar Electric Generating System (Ivanpah SEGS). Solar Partners I, LLC; Solar Partners II, LLC; Solar Partners VIII, LLC, the owners of the three separate solar plants, and Solar Partners IV, LLC, the owner of shared facilities required by the three solar plants, are the proponent for the project. These four companies are Delaware limited liability corporations. BrightSource Energy Inc. (BrightSource), a Delaware corporation, is a technology and development company, and the parent company of the Solar Partners. The proposed project includes two 100-MW phases (known as Ivanpah 1 and 2) and a 200-MW phase (Ivanpah 3). Each 100-MW site requires about 917 acres (or 1.4 square miles); the 200-MW site is about 1,843 acres (or about 2.9 square miles). In addition, a substation and some stormwater detention ponds would be located in the area between Ivanpah 1 and 2 and require about 60 acres, along with some other permanent facilities like transmission towers and access roads. The total area required for all three phases is approximately 3,760 acres.

The information provided in this report is intended to assist the U.S. Army Corps of Engineers (USACE) with a determination of the extent of jurisdictional waters of the U.S. within the project study area. In addition, this report may also provide information that may be of use to the California Department of Fish and Game (CDFG), and the State Water Quality Control Board in determining the extent of state jurisdiction in the project area.

1.1 Project Location

The proposed site is located in the Mojave Desert in eastern San Bernardino County, 4.5 miles southwest of Primm, Nevada, 3.1 miles southwest of the California-Nevada border (Figure 1-1, figures are located at the end of each section). The site is located in Township 17N, Range 14E, and Township 16N, Range 14E, on land administered by the Bureau of Land Management. The center of the project is located between Sections 33 and 34 of Township 17N, Range 14E. Figure 1-2 shows the proposed project within the corresponding Township, Range, and Sections.

The site can be accessed from the Yates Well Road Exit off Interstate Highway 15 (I-15), continuing along Colosseum Road for approximately 2 miles, past the Southern California Edison 115-kilovolt (kV) transmission corridor line that bisects the site.

1.2 Environmental Setting

The project area is located within the Ivanpah Valley, an elongated north-south trending topographic basin that crosses the California-Nevada border. The project area is northwest of I-15, which runs through the northern part of the Ivanpah Valley. In the valley bottom are Ivanpah Dry Lake, in California, and Roach Lake to the north, in Nevada. These dry lakes are at an elevation of about 2,400 feet. Several mountain ranges surround the Ivanpah

Valley. The Ivanpah Valley is bounded by the Lucy Grey Range and McCullough Mountains to the east, the New York Mountains and the Mid-Hills to the south, the Ivanpah Mountains, Mescal Range, and Clark Mountain to the west, and the Clark Mountain and southernmost Spring Range to the north. Clark Mountain, which, at 7,929 feet in elevation, is the highest peak of those surrounding the Ivanpah Valley.

The project area is located within the Mojave Desert, and its biogeography and climate are typical of that region. In terms of surface water hydrology, the Ivanpah Valley has no surface outlet to the ocean, therefore, hydrologically, it is a part of the southwestern hydrographic Great Basin. The project area is located on an alluvial fan, or bajada, that extends eastward from the base of the Clark Mountain Range toward Ivanpah Dry Lake. The alluvial fan topography slopes very gradually (3 to 5 percent) to the east and southeast from a high elevation of about 3,150 feet in the northwest corner to about 2,850 feet in the southeast corner. The alluvial fan is dissected by many ephemeral wash drainage features. Most are small (active channels 1 to 3 feet wide), but some are much larger, with bank-to-bank widths of more than 50 feet and active channels 5 to 15 or more feet wide.

Two distinct small hills arise within the alluvial fan. To the east is a hill composed mainly of reddish metamorphic rocks that, in this report, will be referred to as Metamorphic Hill. To the west is a much smaller gray limestone hill. To the north are the northeastern foothills of the Clark Mountain Range, composed mainly of limestone. The following sections summarize the vegetation, climate, hydrology, and soils of the project area.

1.2.1 Vegetation

Mojave Creosote Bush Scrub is the predominant vegetation type within the project area. Mojave Yucca–Nevada Ephedra Scrub is located at the northern boundary of the 1-mile buffer and very small inclusions of Mojave Wash Scrub were observed (not mapped) within the project boundaries (Figure 1-3). Mojave Creosote Bush Scrub corresponds to the Holland type of the same name (Holland 1986) and may correspond to one or more of the Creosote Bush, Creosote Bush–White Bursage, or Black Bush series of *A Manual of California Vegetation* (Sawyer and Keeler-Wolf 1995). Mojave Creosote Bush Scrub is composed of widely spaced evergreen and drought-deciduous shrubs, cacti, and yucca, from 1 to 9 feet in height. Creosote bush (*Larrea tridentata*) is the dominant species with Burrobush (*Ambrosia dumosa*), cheesebush (*Hymenoclea salsola*), Nevada ephedra (*Ephedra nevadensis*), and Mojave yucca (*Yucca schidigera*) common associates throughout the project site. Several species of cacti including California barrel cactus (*Ferocactus cylindraceus* var. *lecontei*), clustered barrel cactus (*Echinocactus polycephalus* var. *polycephalus*), Engelmann’s hedgehog cactus (*Echinocereus engelmannii*), silver cholla (*Opuntia echinocarpa*), buckhorn cholla (*Opuntia acanthocarpa* var. *coloradensis*), pencil cactus (*Opuntia ramosissima*), and beavertail cactus (*Opuntia basilaris* var. *basilaris*) are also common in parts of this community.

Mojave Yucca–Nevada Ephedra Scrub is restricted to a small area of limestone-dominated pavement plain on the northern edge of the 1-mile buffer area (see Figure 1-3). This vegetation type may correspond to the Mojave Yucca Scrub and Steppe type, which is named but not described by Holland (1986). It also may correspond to the Mojave Yucca series of Sawyer and Keeler-Wolf (1995). The dominant plants are Mojave yucca and Nevada ephedra, which form a moderately dense plant cover from 3 to 6 feet in height.

Creosote bush and burrobrush are almost entirely lacking. Spiny menodora and Engelmann's hedgehog cactus are also relatively common.

Mojave Wash Scrub is a shrub-dominated vegetation type found in larger washes, arroyos, and canyons throughout the Mojave Desert. This type corresponds to the Holland vegetation type of the same name (Holland 1986) and may correspond to the Catclaw Acacia series in *A Manual of California Vegetation* (Sawyer and Keeler-Wolf 1995). The dominant shrubs are mainly drought-deciduous and range from 1 to 12 feet in height. Dominant species include: catclaw acacia (*Acacia greggii*), desert willow (*Chilopsis linearis*), cheesebush, pygmy-cedar (*Peucephyllum schottii*), black-banded rabbitbrush (*Chrysothamnus paniculatus*), mesquite (*Prosopis* species), desert almond (*Prunus fasciculata*), bladder-sage (*Salazaria mexicana*), and blue sage. Perennial herbs are regular components of this vegetation type. Annual herbs may be present in high density and diversity during wet years and after localized flood events.

1.2.2 Climate and Hydrology

The Ivanpah Valley climate is hot and arid, with extreme fluctuations in daily temperatures. Average temperatures range from 70°F in the winter to summer temperatures exceeding 100°F. Strong, dry winds are characteristic of late winter and early spring, particularly in the late afternoon to early evening. In the rain shadow created by the Sierra Nevada Mountains, the Mohave Desert generally has low humidity and precipitation. May and June are the driest months, with seasonal thunderstorms from July to September, and the majority of the precipitation falling from October to April. The average annual rainfall is 4.5 inches, but the 2006 -2007 season was unusually dry with only 1.7 inches of precipitation (National Weather Service 2007).

The project area is located in the Ivanpah hydrologic unit of the South Lahontan Watershed, which includes approximately 278,486 acres in the Ivanpah and Pahrump Valleys of California and Nevada (CDFG-BIOS 2007). In this area, all drainage is internal with the rapid runoff from mountains and alluvial fans collecting in closed basins in the Ivanpah Valley. Streams, washes, and playas are dry most of the year, with surface water only present in response to storm events. Ivanpah Lake is located approximately 2 miles east and downslope of the project area. The extensive dry lake bed covers approximately 35 square miles and is located in California adjacent to the California/Nevada border. There are two mapped springs, Whisky Spring and Ivanpah Spring, located approximately 1.6 miles west of the proposed project site in the foothills of the Clark Mountains.

1.3 Soils

The *Soil Survey of the Mojave Desert Area, Northeast Part, California* (NRCS 2007a) includes five soil units mapped within the project site and 1-mile buffer (Figure 1-4). Arizo loamy sand, 2 to 8 percent slopes, comprises the majority of the project study areas with limited areas of Copperworld soils along the western edge of the Ivanpah 3 site. Other soil units in the vicinity included the Umberci rock outcrop association and Colosseum association mapped at the extreme northern edge of the 1-mile buffer, and Popups sandy loam in the southwestern part of the buffer. These soils types are briefly described in the following

sections based on the official soil series descriptions from the NRCS (2007b). All soil colors are for moist soils unless otherwise stated.

Arizo Loamy Sand, 2 to 8 Percent Slopes

The Arizo series are the most common and widespread mapped soil unit in the project study area. This very deep soil formed in mixed alluvium and is found on recent alluvial fans, stream terraces, and floodplains of intermittent streams and channels. The uppermost horizon (0 to 8 inches), typically consists of dark grayish-brown (10YR 4/2) very gravelly fine sand. Below 8 inches the soils are a dark grayish-brown (10YR 4/2) extremely gravelly sand. Soil in the upper horizons are moderately alkaline (pH 8.2). This soil is excessively drained with negligible to medium runoff, and rapid to very rapid permeability.

Copperworld Association, 30 to 60 Percent Slopes

The Copperworld series consists of very shallow or shallow to bedrock that formed in residuum and colluvium from metamorphic rocks. This soil occurs on the hills to the east and southwest of the project study area with slopes ranging from 30 to 60 percent. This soil is generally covered with 15 percent fine gravel, 55 percent medium and coarse gravel, 10 percent cobbles, 3 percent stones, and 3 percent boulders. The surface layer is typically a dark yellowish-brown (10YR 3/4) to dark brown (10YR 3/3) gravelly sandy loam with pH ranging from 7.2 to 7.4. Indurated metamorphic bedrock is often present within the top 6 inches with root fractures greater than 2.5 inches apart. This soil is somewhat excessively drained with medium to high runoff and moderately rapid permeability above the bedrock.

Popups Sandy Loam, 2 to 30 Percent Slopes

The Popups series formed in mixed alluvium and consists of moderately deep soils over a duripan. Slopes generally range from 2 to 30 percent. The upper 2 inches of the soil is typically a dark brown (10YR 3/3), very gravelly sandy loam. From 2 to 12 inches, the soil is a dark yellowish-brown (10YR 5/3) gravelly sandy loam. Surface soils are slightly alkaline (pH 7.6). Below 12 inches, the soil is a moderately alkaline (pH 8.0), brown (7.5YR 4/4) gravelly sandy loam. A weakly cemented duripan is present at a depth of approximately 33 inches. Popups soils are well drained with low to medium runoff.

Umberci-Rock Outcrop Association, 30 to 75 Percent Slopes

The Umberci soils are formed in residuum and colluvium from limestone and dolomite and are very shallow to bedrock. These soils are found on mountains and hills with slopes ranging from 30 to 75 percent. Typically there is a moderately alkaline (pH 8.2) shallow surface horizon (5 inches) that is a yellowish brown (10YR 4/4) gravelly sandy loam to very gravelly fine sandy loam. The surface is covered by 74 percent gravel, 15 percent cobbles, 5 percent stones, and 1 percent boulders. Umberci soils are well drained with very high runoff.

Colosseum Association, 2 to 15 percent slopes

The Colosseum series includes very deep soils that formed in alluvium derived from limestone and dolomite. These soils are on fan aprons and drainageways with slopes ranging from 2 to 15 percent. The shallow surface horizon (4 inches) is a moderately alkaline (pH 8.2), brown (10YR 5/3) fine sandy loam to gravelly loamy sand that is covered by

80 percent gravel and 5 percent cobbles. Below 4 inches, the soil is a moderately alkaline (pH 8.4), brown (10YR 5/3) extremely gravelly loamy sand. Colosseum soils are somewhat excessively drained with negligible to very low runoff and moderately rapid permeability.

1.3.1 Hydric Soils

The soil types on the site were not identified on the California State hydric soils list (NRCS 2007c).

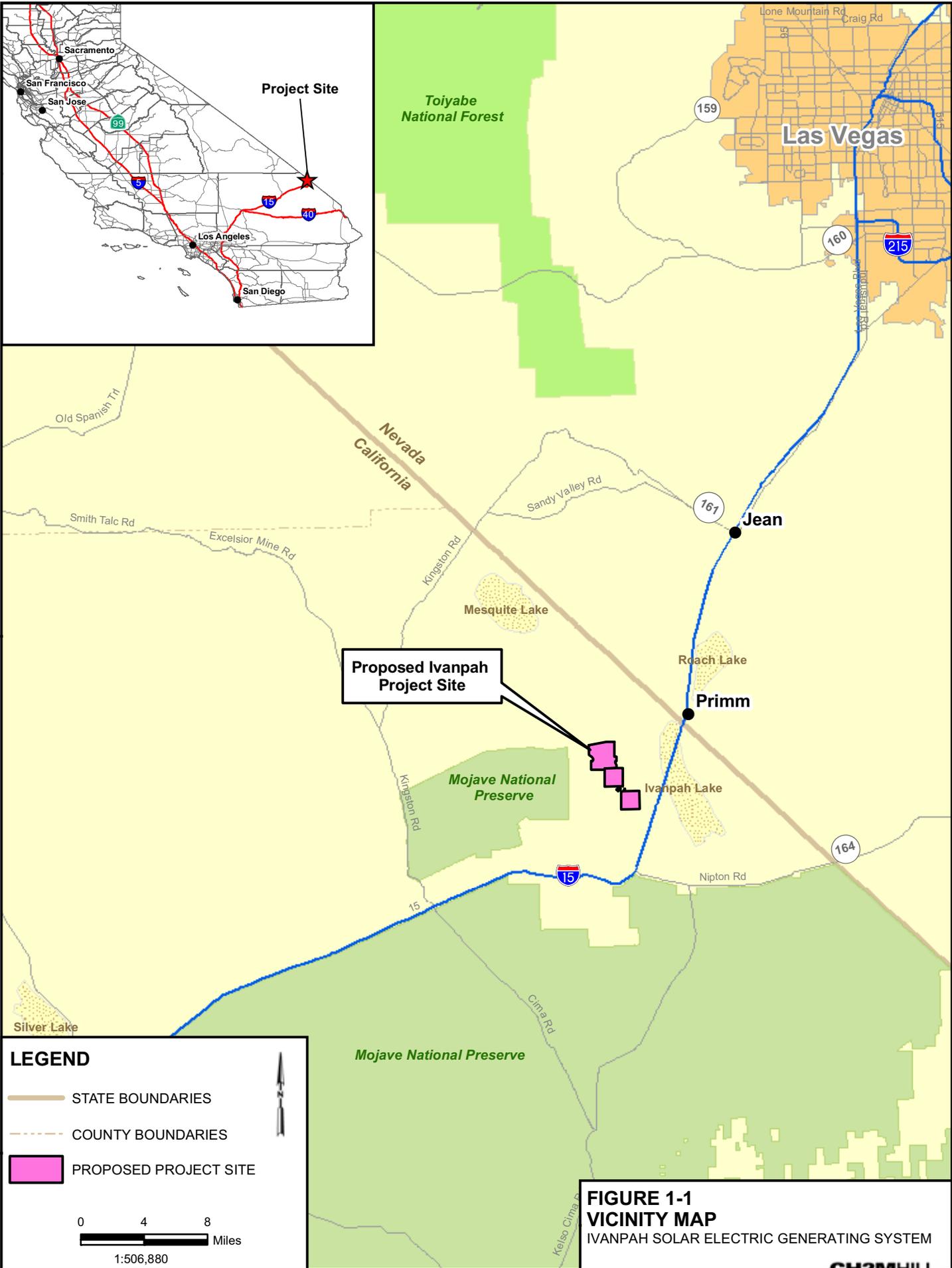


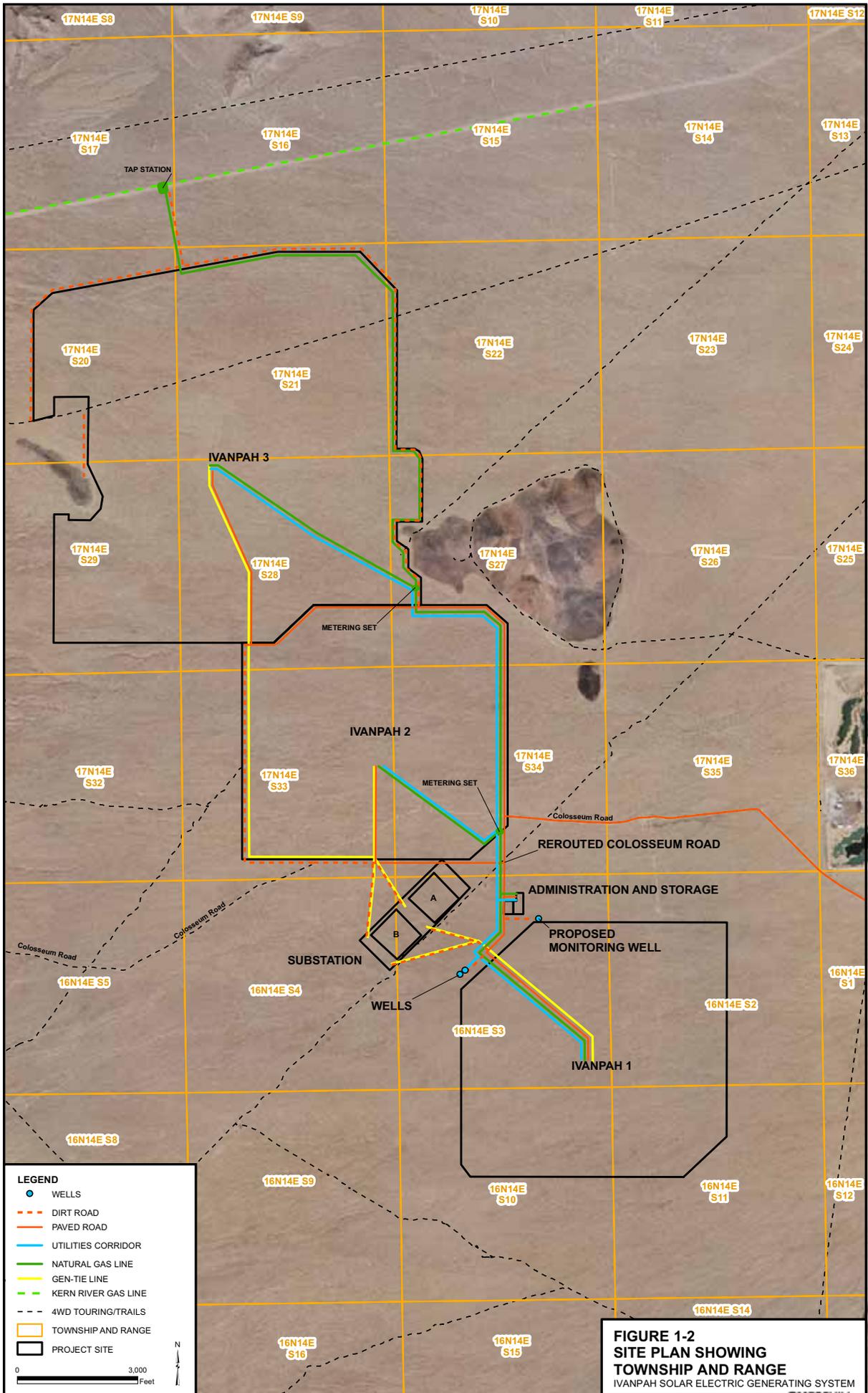
FIGURE 1-1
VICINITY MAP
 IVANPAH SOLAR ELECTRIC GENERATING SYSTEM

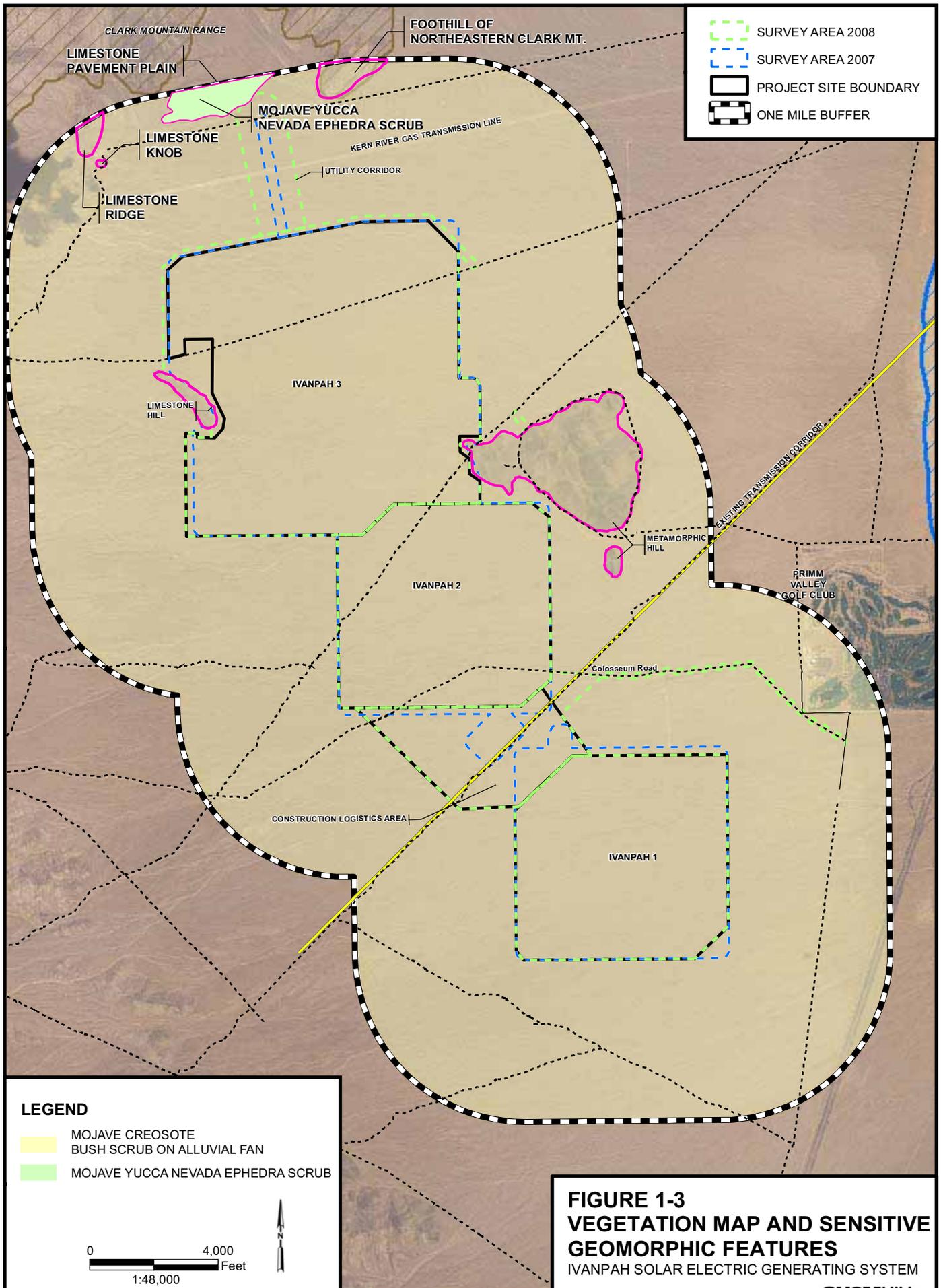
LEGEND

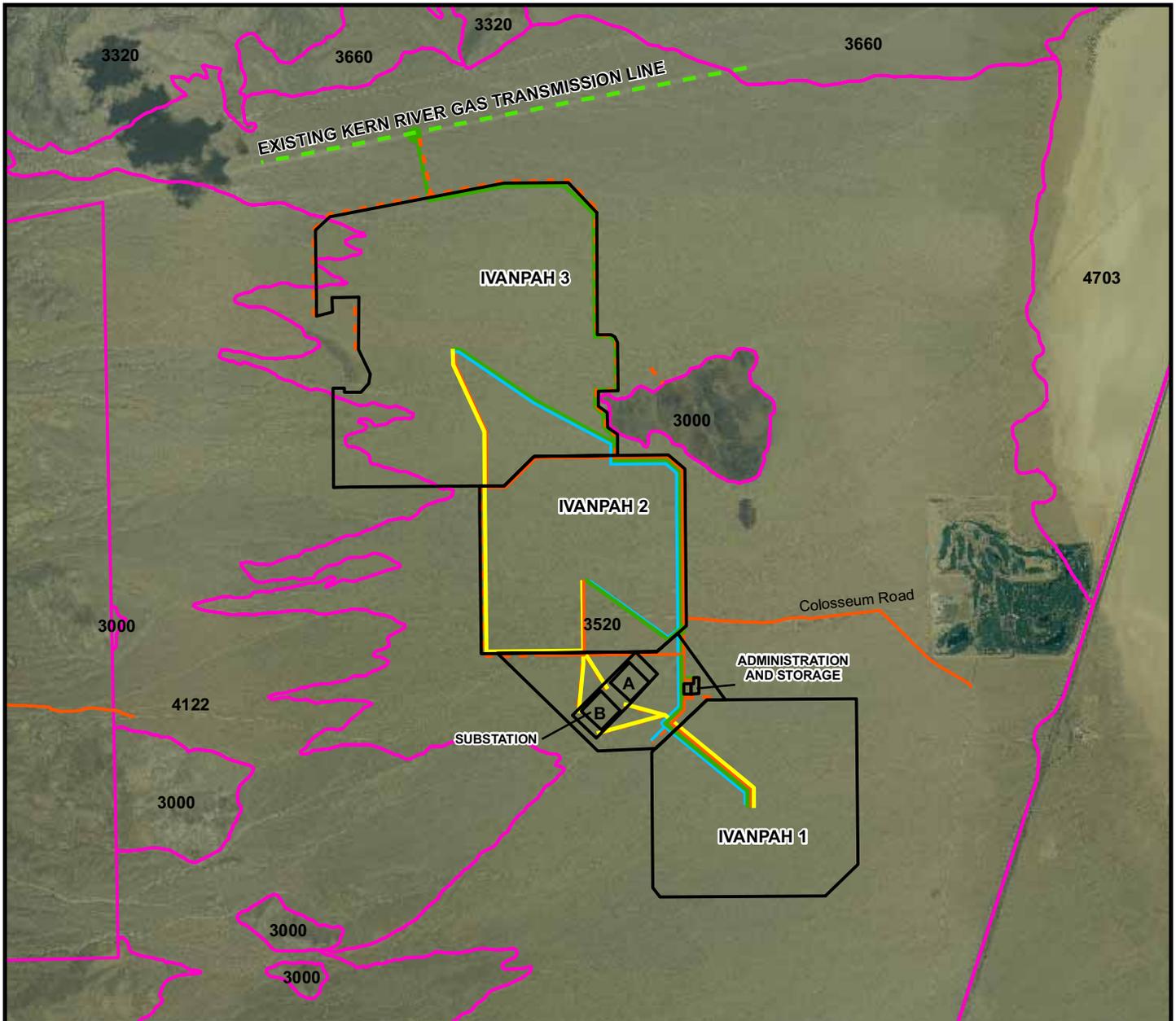
-  STATE BOUNDARIES
-  COUNTY BOUNDARIES
-  PROPOSED PROJECT SITE

0 4 8
 Miles

1:506,880







LEGEND

- UTILITIES CORRIDOR
- - - DIRT ROAD
- PAVED ROAD
- NATURAL GAS LINE
- GEN-TIE LINE
- - - KERN RIVER GAS LINE
- WETLAND SURVEY AREA 2008
- SOIL BOUNDARIES

MAP UNIT SYMBOL	SOIL DESCRIPTION
3000	Copperworld association, 30 to 60 percent slopes
3320	Umberci-Rock outcrop association, 30 to 75 percent slopes
3520	Arizo loamy sand, 2 to 8 percent slopes
3660	Colosseum Association, 2 to 4 percent slopes
4122	Popups sandy loam, 4 to 30 percent slopes
4703	Typic Haplosalids, 0 to 2 percent slopes
NOTCOM	Obsolete term for unmapped areas

SOURCE: NRCS 2007



FIGURE 1-4
SOIL TYPES
 IVANPAH SOLAR ELECTRIC GENERATING SYSTEM

SECTION 2

Methods

Aerial photographs and the Ivanpah Lake United States Geological Survey (USGS) 7.5-Minute Quadrangle Map were used to identify potential wetland and water resources in the project area. A site reconnaissance survey and preliminary assessment of water features was conducted on March 29 and 30, 2007. The preliminary data review and site reconnaissance survey identified numerous west to east trending ephemeral washes throughout the project area. Given the size of the study area and the myriad of features present, the characterization and mapping of these drainages was accomplished by a combination of field surveys and mapping using high-resolution aerial photographs. Prior to field surveys, this proposed methodology was discussed with USACE regulatory staff from the Los Angeles District (Pers. Comm. Shannon Pankratz 2007).

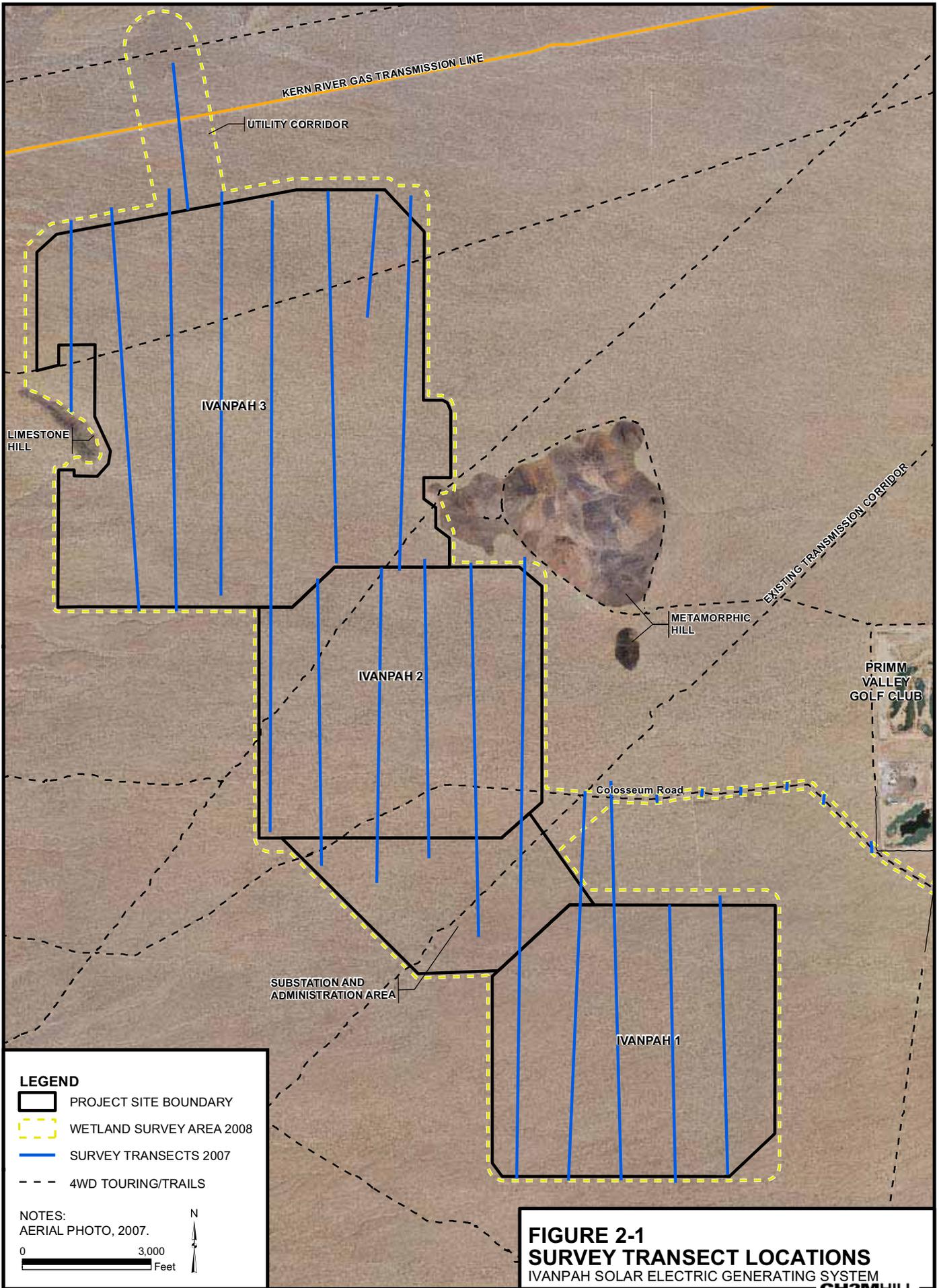
The formal wetland delineation field surveys were conducted from April 16 through 20, and May 21 through 24, 2007. The total survey area delineated was approximately 4,272 acres, and included the proposed disturbance areas as well as a 1,000-foot buffer area for each of the three project sites, access roads, and linear utility corridors. Linear transects perpendicular to the ephemeral drainages (north-south orientation) were established approximately every 1,000 feet (Figure 2-1). Pedestrian surveys were then conducted along each transect and data were recorded at each point where an ephemeral wash intersected the transect line.

The location of each crossing was recorded using a Trimble® Geo-XT global positioning device and general characteristics of the wash, including average channel width, evidence of flow, and general vegetation were noted. Field data were then incorporated into a geographic information system (GIS). Data points collected along the transect lines were then plotted on recent aerial photographs, with 2-foot resolution, and the drainage features within the survey area were manually digitized using the field data as reference locations. The project boundary was slightly modified in 2008 (Figure 2-2) and the additional washes in the new area were digitized based on high-resolution aerial photographs from 2008.

Based on the field data, each wash was then assigned a size category class between 1 and 5. Category 1 washes are large ephemeral drainages over 36 feet wide. The largest category 1 wash mapped was 85 feet wide. Category 2 washes are relatively large ephemeral drainages over 20 feet wide and no more than 35 feet wide. Category 3 washes are over 10 feet wide and no more than 20 feet wide. Category 4 includes ephemeral washes over 4 feet wide and no more than 10 feet wide. Category 1, 2, 3 and 4 washes include single, large channels with well-defined bed and banks, as well as broad, but weakly expressed, assemblages of braided erosional channels. Category 5 includes weakly expressed erosional/flow channels that generally lack defined cut banks and are no more than 4 feet wide.

The approximate acreage for the largest washes (categories 1 and 2) washes were calculated using average width for each of the individual washes based on field data and the 2008 aerial photograph. For categories 3, 4 and 5 the approximate acreages was calculated using the median of the category width range and the total length of the washes within each

category. Category 3 (11-20 feet) washes acreages were calculated using a median width of 15.5 feet, category 4 (5-10 feet) washes acreages were calculated using a median width of 7.5 feet and category 5 (1-4 feet) washes acreages were calculated using a median width of 2.5 feet.



KERN RIVER GAS TRANSMISSION LINE

UTILITY CORRIDOR

IVANPAH 3

LIMESTONE HILL

IVANPAH 2

METAMORPHIC HILL

EXISTING TRANSMISSION CORRIDOR

PRIMM VALLEY GOLF CLUB

Colosseum Road

SUBSTATION AND ADMINISTRATION AREA

IVANPAH 1

LEGEND

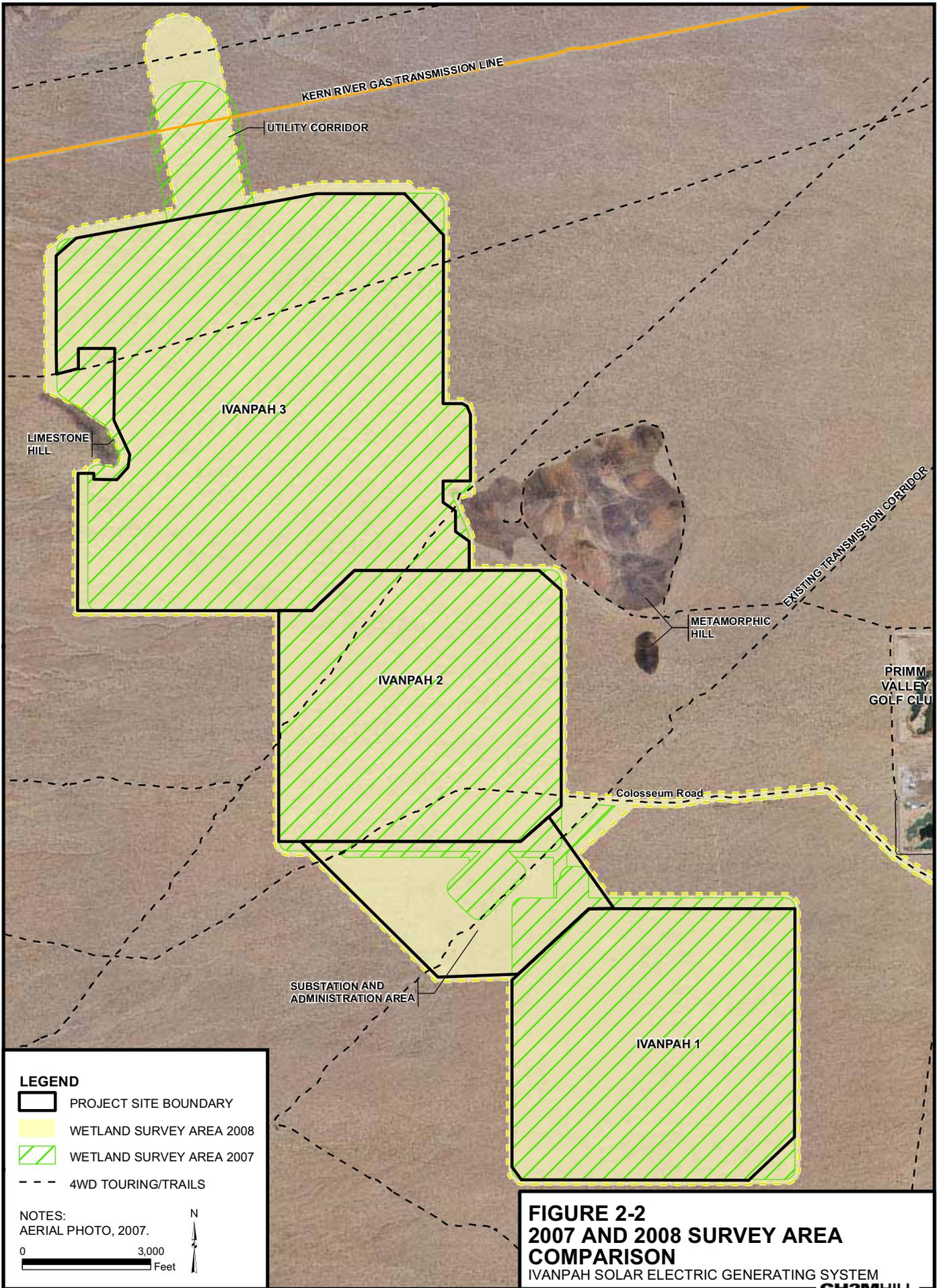
- PROJECT SITE BOUNDARY
- WETLAND SURVEY AREA 2008
- SURVEY TRANSECTS 2007
- 4WD TOURING/TRAILS

NOTES:
AERIAL PHOTO, 2007.

0 3,000
Feet

N
↑

FIGURE 2-1
SURVEY TRANSECT LOCATIONS
IVANPAH SOLAR ELECTRIC GENERATING SYSTEM
CH2MHILL



Results

3.1 Ephemeral Washes

The entire study area is dissected by numerous ephemeral washes ranging in size from small (1 to 4 feet wide), weakly expressed erosional features to large, broad (over to 85 feet wide) drainages that occur throughout the Mojave Creosote Bush Scrub habitat. The active flow channels of the smaller washes are generally devoid of vegetation and typically have a sandy-gravel substrate, although some washes also contained cobble and scattered larger rocks. Most of the larger channels typically contained scattered vegetation including creosote bush and cheesebush; especially in braided channels that contain slightly elevated areas intermixed with the active flow channels. Mojave Wash Scrub is limited to the larger washes (typically over 15 feet) with sandy gravel substrate and well-defined banks. Vegetation associated with these features included catclaw (*Acacia greggii*), cheesebush, Mojave Desert California Buckwheat (*Eriogonum fasciculatum* ssp. *polifolium*), desert willow (*Chilopsis linearis*), black-banded rabbitbrush (*Chrysothamnus paniculatus*), bladder-sage (*Salazaria mexicana*), desert almond (*Prunus fasciculata*), Virgin River encelia (*Encelia virginensis*), Anderson's boxthorn (*Lycium andersonii*), Cooper's boxthorn (*Lycium cooperi*), sand-wash groundsel (*Senecio flaccidus* var. *monoensis*), wire lettuce (*Stephanomeria pauciflora*), and blue sage (*Salvia dorrii*) (Table 3.1-1).

Approximately 198.72 acres of ephemeral washes were identified and mapped in the project study area (Table 3.1-2). The project study area includes approximately 16.78 acres of category 1 washes, 8.22 acres of category 2 washes, 40.37 acres of category 3 washes, 73.71 acres of category 4 washes, and 55.68 acres of category 5 washes (Table 3.1-2). Small- to medium-sized washes are common and widespread throughout the entire project area, while the larger washes (categories 1, 2 and 3) are most abundant in the northern section of Ivanpah 3 as well as the east and west sides of Ivanpah 2 (Figures 3-1 through 3-3; and Appendix A). The larger washes tend to dissipate into smaller, more braided channels as they progress downslope. The majority of the drainages terminate prior to reaching Ivanpah Dry Lake with defined erosion features diminishing and becoming broad surface flow only. All of the ephemeral washes identified in the study area typically flow only in response to storm events. Representative photographs of the drainage features are provided in Appendix B.

TABLE 3.1-1
Plant Species Associated with the Ephemeral Washes in the Study Area

Scientific Name	Common Name	Wetland Indicator¹	Distribution
<i>Acacia greggii</i>	catclaw	FACU	Sparse
<i>Ambrosia dumosa</i>	burrobush	NOL	Common
<i>Ambrosia eriocentra</i>	woolly bursage	NOL	Scattered
<i>Amsonia tomentosa</i>	woolly amsonia	NOL	Sparse
<i>Bebbia juncea</i>	sweetbush	NOL	Sparse
<i>Chamaesyce albomarginata</i>	rattlesnake weed	NOL	Sparse
<i>Chilopsis linearis</i>	desert willow	FACW*	Sparse
<i>Chrysothamnus paniculatus</i>	black-banded rabbitbrush	NOL	Common
<i>Encelia virginensis</i>	Virgin River encelia	NOL	Scattered
<i>Ephedra nevadensis</i>	Nevada ephedra	NOL	Common
<i>Eriogonum fasciculatum</i>	California buckwheat	NOL	Common
<i>Hymenoclea salsola</i>	cheesebush	NOL	Common
<i>Larrea tridentata</i>	creosote bush	NOL	Abundant
<i>Lepidium fremontii</i>	desert alyssum	NOL	Sparse
<i>Lycium andersonii</i>	Anderson box-thorn	NOL	Sparse
<i>Opuntia acanthocarpa</i>	buckhorn cholla	NOL	Common
<i>Opuntia ramosissima</i>	pencil cholla	NOL	Common
<i>Penstemon (palmeri or bicolor)</i>	Penstemon	NOL	Sparse
<i>Petalonyx thurberi</i>	Thurber sandpaper plant	NOL	Sparse
<i>Porophyllum gracile</i>	slender poreleaf	NOL	Sparse
<i>Prunus fasciculata</i>	desert almond	NOL	Sparse
<i>Salazaria mexicana</i>	Mexican bladder sage	NOL	Common
<i>Salvia dorrii</i>	blue sage	NOL	Sparse
<i>Senecio flaccidus</i>	sand-wash groundsel	NOL	Sparse
<i>Stephanomeria pauciflora</i>	wire-lettuce	NOL	Sparse
<i>Yucca schidigera</i>	Mojave yucca	NOL	Common

TABLE 3.1-1
 Plant Species Associated with the Ephemeral Washes in the Study Area

Scientific Name	Common Name	Wetland Indicator ¹	Distribution
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¹= National List of Plant Species that Occur in Wetlands, Region 0 [California] (Reed 1988).

FACW – = Facultative Wetland Status; Estimated probability of 67% to 99% chance of occurring in wetlands.

FACU – = Facultative Upland Status; Estimated probability of 1% to 33% chance of occurring in wetlands.

NOL – Plant species is not included in the 1988 list and is considered to be an upland species = Not on 1988 List.

+, -, * Indicates a tentative indicator status= Modifiers developed by the National Plant List Panel.

Abundant = plants are widespread along the channel and with relatively high cover where present

Common = plants are widespread along the channel with moderate to low cover; occasional locally high cover

Scattered = plants have a patchy distribution throughout along the channel, cover ranges from sparse to locally high

Sparse = plants observed in a few locations with generally sparse cover, not common throughout along the channel

TABLE 3.1-2
Summary of Ephemeral Washes Identified in the Project Study Area

Wash Category	Project Feature	Number of Washes*	Wash Length (feet)	Wash Acreage
Category 1 (36-85 feet)	Ivanpah 1	0	0	0.00
	Ivanpah 2	3	7,066	7.48
	Ivanpah 3	4	5,392	8.29
	Utility Corridor	1	1,100	1.01
	Colosseum Road	0	0	0.00
	Substation and Administrative Area	0	0	0.00
	Category 1 Total		8	13,559
Category 2 (21-35 feet)	Ivanpah 1	0	0	
	Ivanpah 2	4	5,847	3.90
	Ivanpah 3	7	6,399	3.96
	Utility Corridor	1	706	0.36
	Colosseum Road	0	0	0.00
	Substation and Administrative Area	0	0	0.00
	Category 2 Total		12	12,953
Category 3 (11-20 feet)	Ivanpah 1	10	19,850	7.06**
	Ivanpah 2	22	21,903	7.79**
	Ivanpah 3	32	46,069	16.39**
	Utility Corridor	8	8,497	3.02**
	Colosseum Road	9	6,018	2.14**
	Substation and Administrative Area	13	11,111	3.95**
	Category 3 Total		94	113,446
Category 4 (5-10 feet)	Ivanpah 1	95	103,016	17.74**
	Ivanpah 2	130	110,833	19.08**
	Ivanpah 3	171	169,855	29.24**
	Utility Corridor	16	8,624	1.48**
	Colosseum Road	11	3,589	0.62**
	Substation and Administrative Area	36	32,167	5.54**
	Category 4 Total		459	428,083

TABLE 3.1-2
Summary of Ephemeral Washes Identified in the Project Study Area

Wash Category	Project Feature	Number of Washes*	Wash Length (feet)	Wash Acreage
	Ivanpah 1	397	245,095	14.07**
	Ivanpah 2	292	200,172	11.49**
	Ivanpah 3	449	399,574	22.93**
Category 5 (1-4 feet)	Utility Corridor	29	24,459	1.40**
	Colosseum Road	36	4,442	0.25**
	Substation and Administrative Area	197	96,386	5.53**
	Category 5 Total	1,400	970,129	55.68
All Categories (Total)		1,973	1,538,170	198.72

Note:

* Number of washes is based on number of segments in each category mapped in each of the project areas.

** Acreage calculated using Wash Length and the median width of the category range

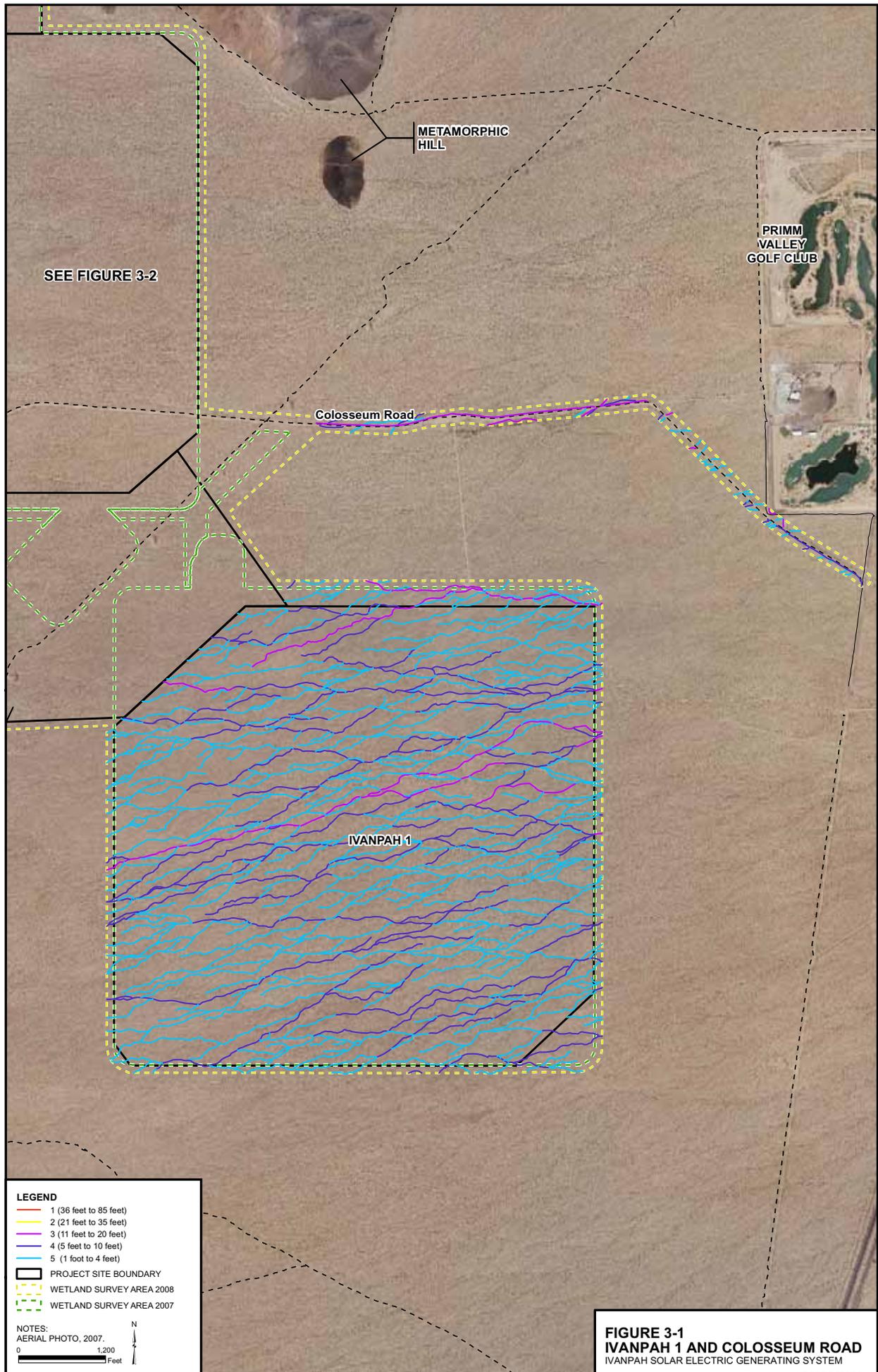
No wetlands were observed within the entire project area.

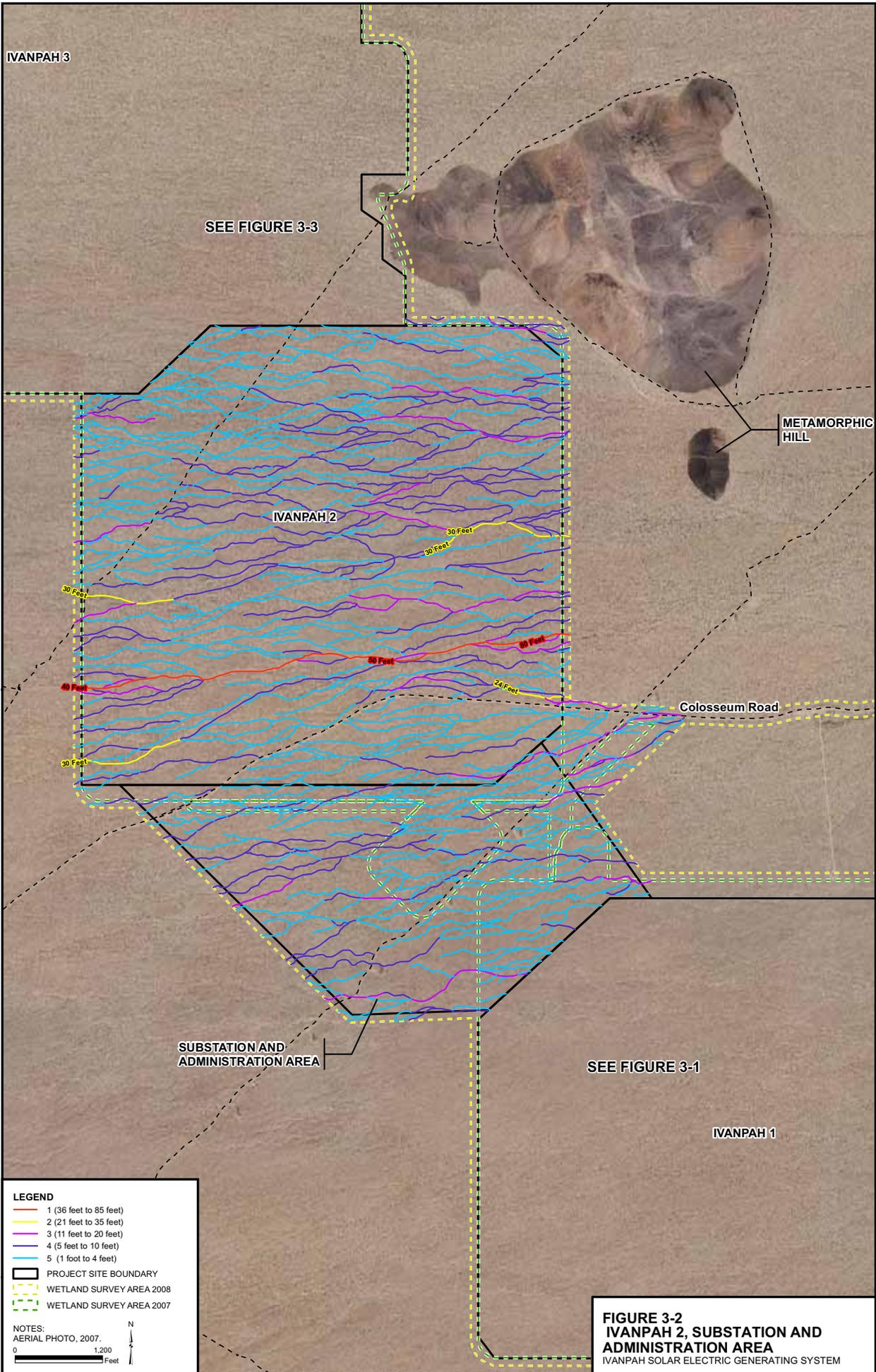
3.2 Summary of Potential Jurisdictional and Non-Jurisdictional Features Identified in the Analysis Area

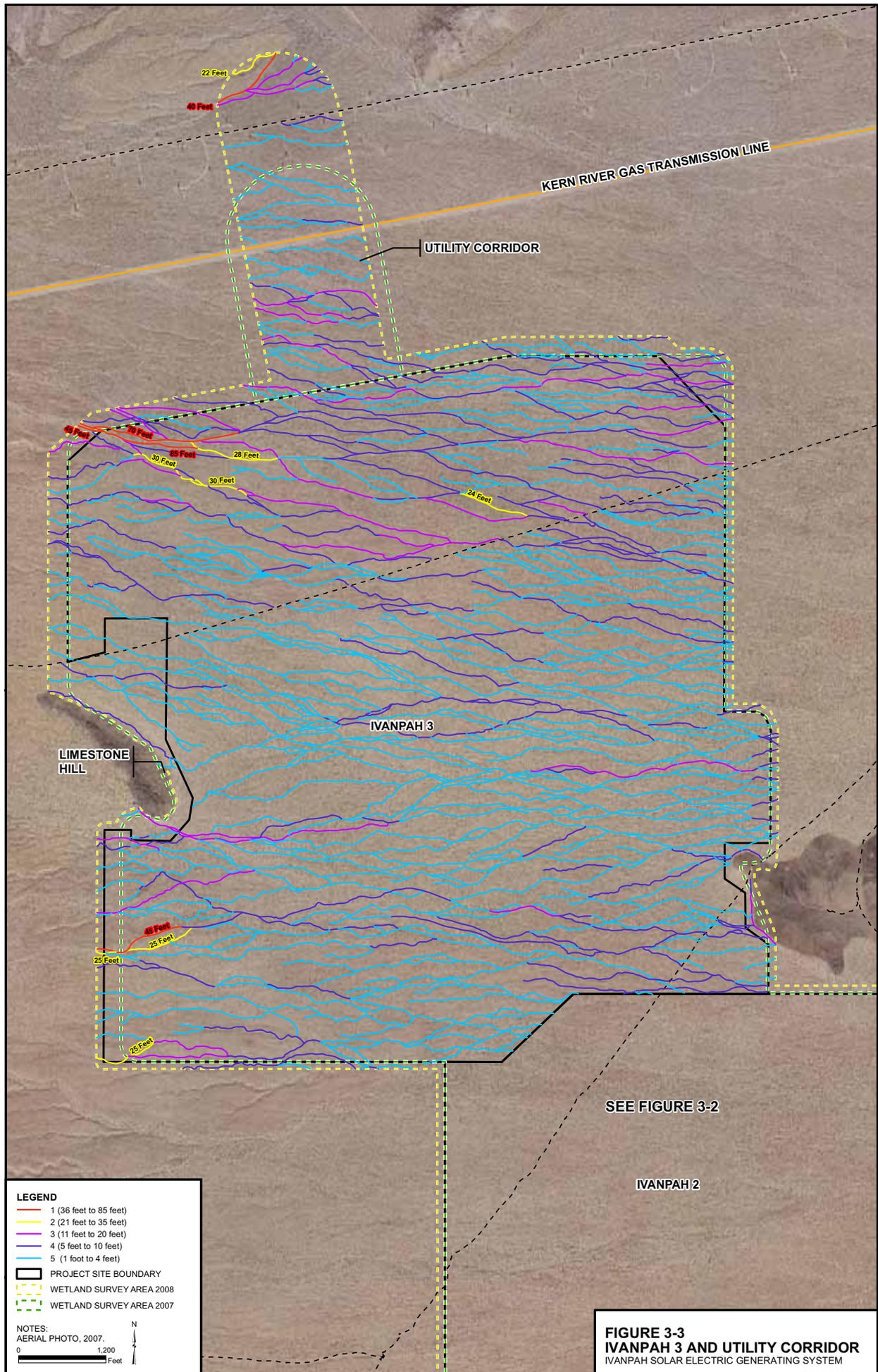
Waters of the U.S. are defined as all navigable waters, including: (1) all tidal waters; (2) all interstate waters and wetlands; (3) all other waters such as lakes, rivers, streams (perennial or intermittent), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds; the use, degradation, or destruction of which could affect interstate commerce; (4) all impoundments of water mentioned above; (5) all tributaries to waters mentioned above; (6) territorial seas; and (7) all wetlands adjacent to waters mentioned above. Waste treatment systems, including treatment ponds, are not Waters of the U.S. (33 CFR Section 328.3). Based on the recent guidance issued from USACE Headquarters, jurisdictional waters of the U.S. include traditional navigable waters (TNWs), all wetlands adjacent to TNWs, non-navigable tributaries of TNWs that are relatively permanent (i.e., tributaries that typically flow year-round or have continuous flow at least seasonally), and wetlands that directly abut such tributaries (USACE 2007). Additionally, jurisdiction is asserted over water bodies that are not relatively permanent if that body is determined to have a significant nexus with a TNW (USACE 2007).

Under the recent guidance, desert swales defined as “shallow features in the landscape that may convey water across upland areas during and following storm events,” and erosional gullies are generally considered non-jurisdictional features because they are not tributaries nor do they have a significant nexus to a TNW (USACE 2007). Based on this guidance, the ephemeral washes identified in the project area may be considered non-jurisdictional under the Clean Water Act. However, the USACE is ultimately responsible for jurisdictional determinations and this report has been prepared to provide the necessary information to

assist the USACE with that determination. In addition, the Washes identified in the project area may also be regulated under state laws and regulations administered by the Regional Water Quality Control Board and the California Department of Fish and Game.







LEGEND

—	1 (36 feet to 85 feet)
—	2 (21 feet to 35 feet)
—	3 (11 feet to 20 feet)
—	4 (5 feet to 10 feet)
—	5 (1 foot to 4 feet)
	PROJECT SITE BOUNDARY
	WETLAND SURVEY AREA 2008
	WETLAND SURVEY AREA 2007

NOTES:
 AERIAL PHOTO, 2007.
 0 1,200 Feet

FIGURE 3-3
IVANPAH 3 AND UTILITY CORRIDOR
 IVANPAH SOLAR ELECTRIC GENERATING SYSTEM

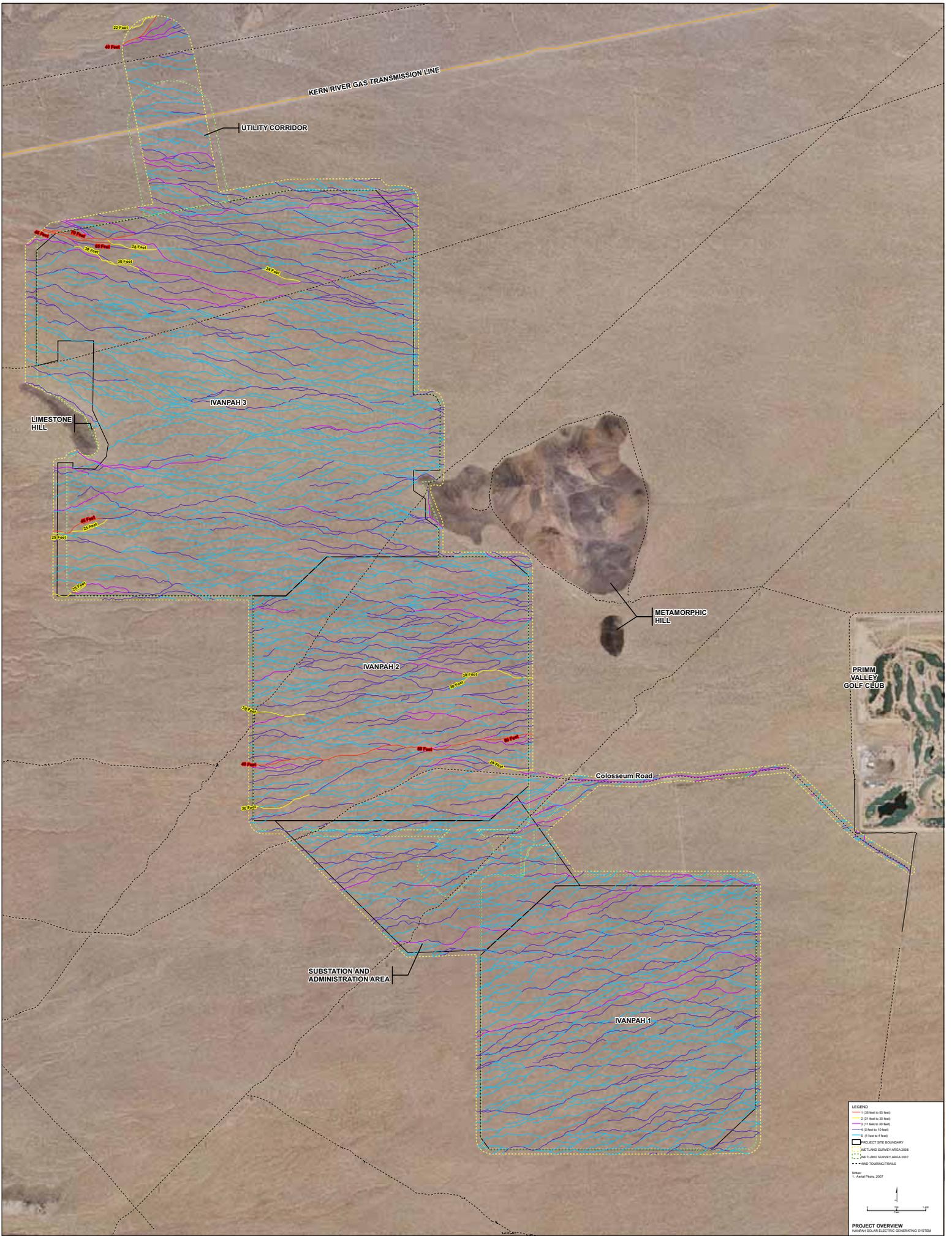
SECTION 4

References

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- Sawyer, J. and T. Keeler-Wolf. 1995. A manual of California vegetation. California Native Plant Society, Sacramento.
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APPENDIX A

Overview Map of all Washes in the Study Area



KERN RIVER GAS TRANSMISSION LINE

UTILITY CORRIDOR

IVANPAH 3

LIMESTONE HILL

METAMORPHIC HILL

IVANPAH 2

PRIMM VALLEY GOLF CLUB

Colosseum Road

SUBSTATION AND ADMINISTRATION AREA

IVANPAH 1

- LEGEND**
- 1 (20 feet to 30 feet)
 - 2 (31 feet to 35 feet)
 - 3 (36 feet to 40 feet)
 - 4 (41 feet to 50 feet)
 - PROJECT SITE BOUNDARY
 - WETLAND SURVEY AREA 2008
 - WETLAND SURVEY AREA 2017
 - WIND TOURING TRAILS



PROJECT OVERVIEW
 WINDPOWER ELECTRIC SUBSTATION AND SYSTEM

APPENDIX B

Representative Photographs



Overview of the project area – looking southeast towards the Ivanpah Dry Lake



Overview of the project area – looking west towards the Clark Mountains



Characteristic creosote brush scrub habitat found throughout the project area



Characteristic creosote brush scrub habitat found throughout the project area



Representative Category 1 Wash (36 feet to 85 feet wide)



Representative Category 1 Wash (36 feet to 85 feet wide)



Representative Category 2 Wash (21 feet to 35 feet wide)



Representative Category 2 Wash (21 feet to 35 feet wide)



Representative Category 3 Wash (11 feet to 20 feet wide)



Representative Category 3 Wash (11 feet to 20 feet wide)



Representative Category 4 Wash (5 feet to 10 feet wide)



Representative Category 4 Wash (5 feet to 10 feet wide)



Representative Category 5 Wash (1 foot to 4 feet wide)



Representative Category 5) Wash (1 foot to 4 feet wide)



CH2M HILL
2485 Natomas Park Drive
Suite 600
Sacramento, CA 95833
Tel 916-920-0300
Fax 916-920-8463

September 10, 2008
File No.: 04.02.06.02
Project No. 357891

Mr. Che McFarlin, Project Manager
California Energy Commission
Systems Assessment and Facilities Siting Division
1516 9th Street, MS 15
Sacramento, CA 95814-5504

RE: Data Response, Set 1G
Ivanpah Solar Electric Generating System (07-AFC-5)

Dear Mr. McFarlin:

On behalf of Solar Partners I, LLC, Solar Partners II, LLC, Solar Partners IV, LLC, and Solar Partners VIII, LLC, please find attached one original and 12 hard copies of Data Response, Set 1G, which addresses Staff's data requests dated December 12, 2007.

Please call me if you have any questions.

Sincerely,

CH2M HILL

A handwritten signature in blue ink, appearing to read "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)

Data Response, Set 1G

(Response to Data Requests for: Biological Resources)

Submitted to the
California Energy Commission

Submitted by
**Solar Partners I, LLC; Solar Partners II, LLC; Solar Partners IV, LLC;
and Solar Partners VIII, LLC**

September 10, 2008

With Assistance from

CH2MHILL
2485 Natomas Park Drive
Suite 600
Sacramento, CA 95833

Introduction

Attached are data responses (Set 1G) by Solar Partners I, LLC; Solar Partners II, LLC; Solar Partners IV, LLC; and Solar Partners VIII, LLC (Applicant) to the California Energy Commission (CEC) Staff's data requests for the Ivanpah Solar Electric Generating System (Ivanpah SEGS) Project (07-AFC-5). The CEC Staff served these data requests on December 12, 2007, as part of the discovery process for Ivanpah SEGS. As with Data Response, Set 1A, the responses are grouped by individual discipline or topic area. Within each discipline area, the responses are presented in the same order as CEC Staff presented them and are keyed to the Data Request numbers (1 through 116). New graphics or tables are numbered in reference to the Data Request number. For example, the first table used in response to Data Request 15 would be numbered Table DR15-1. The first figure used in response to Data Request 15 would be Figure DR15-1, and so on. AFC figures or tables that have been revised have "R1" following the original number, indicating revision 1.

Additional tables, figures, or documents submitted in response to a data request (supporting data, stand-alone documents such as plans, folding graphics, etc.) are found at the end of a discipline-specific section and may not be sequentially page-numbered consistently with the remainder of the document, though they may have their own internal page numbering system.

The Applicant looks forward to working cooperatively with the CEC and Bureau of Land Management (BLM) staff as the Ivanpah SEGS Project proceeds through the siting process. We trust that these responses address the Staff's questions and remain available to have any additional dialogue the Staff may require.

Biological Resources (19 and 29)

Background

AFC Table 5.2-15 provides an overview of permits required for biological resources and indicates that the process for each requires approximately six to nine months. The AFC also refers to informal consultation with staff members at agencies regarding the project and potential biological issues of concern. However, staff could not find any documentation on the dates, personnel, and content of communications with the California Department of Fish and Game (CDFG), U.S. Army Corps of Engineers (USACE), Regional Water Quality Control Board (RWQCB), or U.S. Fish and Wildlife Service (USFWS) regarding sensitive biological resources, such as the federally threatened desert tortoise, jurisdictional waters, and permitting requirements. In addition, a USFWS-approved Biological Assessment (BA) with agreed upon mitigation needs to be provided so the Preliminary and Final Staff Assessments can be completed.

Data Request

19. For jurisdictional waters, please provide expected impact acreages as well as mitigation ratios and acreages for the Clean Water Act section 401 and 404 permits and CDFG Streambed Alteration Agreement, as appropriate.

Response: The wetland delineation report submitted to the USACE in February, 2008 has been revised per comments received from Shannon Pankratz. The revised report is provided as Attachment DR19-1B. Copies are being submitted to the parties as well as USACE and other agencies. Five copies of the report containing an E-size (~ 34" x 44") drawing will be sent to both CEC and BLM.

Background

As noted in the AFC, ravens are known to prey upon juvenile desert tortoise and other wildlife species. However, ravens are a migratory species and federally protected under the Migratory Bird Treaty Act. Perch-deterrent device installation is mentioned in the AFC on page 5.2-67, but the facilities upon which they would be installed are not specified. In addition, CDFG commented in a March 23, 2007 letter on Victorville 2, another desert solar project, regarding the need for a sufficiently detailed raven control plan.

Data Request

29. Please provide a detailed raven control plan that discusses, but is not limited to the following elements:
 - a. coordination process with CDFG and USFWS

- b. area to be covered by the plan
- c. use of perch-deterrent devices and locations of installation
- d. circumstances when nest removal would be necessary
- e. remedial actions that would be employed if evidence of raven predation of juvenile desert tortoise is detected and the circumstances that would trigger the implementation of remedial actions
- f. facility/project owner staff expected to implement the raven control plan and their qualifications

Response: It is our understanding that BLM is in the process of preparing a Raven Management Plan that will be universally applied to projects on BLM land District-wide. It is Applicant's intention of complying with the conditions of BLM's plan.



CH2M HILL
2485 Natomas Park Drive
Suite 600
Sacramento, CA 95833
Tel 916-920-0300
Fax 916-920-8463

September 10, 2008
File No.: 04.02.06.02
Project No. 357891

DOCKET	
07-AFC-5	
DATE	SEP 10 2008
RECD.	SEP 10 2008

Mr. Che McFarlin, Project Manager
California Energy Commission
Systems Assessment and Facilities Siting Division
1516 9th Street, MS 15
Sacramento, CA 95814-5504

RE: Data Response, Set 1G
Ivanpah Solar Electric Generating System (07-AFC-5)

Dear Mr. McFarlin:

On behalf of Solar Partners I, LLC, Solar Partners II, LLC, Solar Partners IV, LLC, and Solar Partners VIII, LLC, please find attached one original and 12 hard copies of Data Response, Set 1G, which addresses Staff's data requests dated December 12, 2007.

Please call me if you have any questions.

Sincerely,

CH2M HILL

John L. Carrier, J.D.
Program Manager

Enclosure
c: POS List
Project File

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION OF THE
STATE OF CALIFORNIA

APPLICATION FOR CERTIFICATION
FOR THE *IVANPAH SOLAR ELECTRIC
GENERATING SYSTEM*

DOCKET No. 07-AFC-5

PROOF OF SERVICE
(Revised 7/14/08)

INSTRUCTIONS: All parties shall 1) send an original signed document plus 12 copies OR 2) mail one original signed copy AND e-mail the document to the web address below, AND 3) all parties shall also send a printed OR electronic copy of the documents that shall include a proof of service declaration to each of the individuals on the proof of service:

CALIFORNIA ENERGY COMMISSION
Attn: Docket No. 07-AFC-5
1516 Ninth Street, MS-14
Sacramento, CA 95814-5512
doCKET@energy.state.ca.us

APPLICANT

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Alicia Torre, Project Manager
1999 Harrison Street, Suite #500
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Steve De Young
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DECLARATION OF SERVICE

I, Mary Finn, declare that on September 10, 2008 I deposited copies of the attached Data Response, Set 1G in the United States mail at Sacramento, California with first-class postage thereon fully prepaid and addressed to those identified on the Proof of Service list above.

Transmission via electronic mail was consistent with the requirements of California Code of Regulations, title 20, sections 1209, 1209.5, 1210. All electronic pages were sent to all those identified on the Proof of Service list above.

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



Mary Finn