5.5 WATER RESOURCES

The Project includes the construction, operation, maintenance, and abandonment of up to 850 megawatts (MW) of capacity by a solar power generating facility and its ancillary systems in two phases (Phase I: 500MW [approximately 5,838 acres]/Phase II 350MW [approximately 2,392 acres]). The Project will consist of up to approximately 34,000 SunCatchers. Construction is anticipated to occur over an approximate four-year period beginning in 2010 and ending in 2014. It is estimated that approximately an average of 400 construction and 180 long-term labor jobs will be required.

The Project is located in an undeveloped area of San Bernardino County, California approximately 37 miles east of Barstow, California and north of Interstate 40 (I-40) between approximately 1,925 to 3,050 feet above mean sea level. The Project is located primarily on Bureau of Land Management (BLM) land within the Barstow Field Office. Approval of the Project Right-of-Way (ROW) Grant Application (Form 299, Applications CACA 49539 and 49537) will result in the issuance of a ROW Grant Permit for use of federal lands administered by the BLM. The Project would require a plan amendment to the 1980 California Desert Conservation Area (CDCA) Plan.

The area where the Project would be constructed is primarily open, undeveloped land within the Mojave Desert. The Cady Mountain Wilderness Study Area (WSA) is located north of the Solar One site. The Pisgah Crater, within the BLM-designated Pisgah Area of Critical Environmental Concern (ACEC), is located south and east of the Project (south of I-40 by several miles). Several underground and above ground utilities traverse the area.

An approved interconnection letter from California Independent Service Operator (CAISO) has been issued for the Project. The associated System Impact Study (SIS) is located in Appendix H. The SIS indicates that additional upgrades to the Southern California Edison (SCE) Lugo-Pisgah No. 2 Transmission Line and upgrades at the SCE Pisgah Substation will be required for the full build out of the 850MW Project. Supplemental studies performed by SCE and CAISO indicate that capacity is available on the existing transmission system to accommodate less than the 850MW Project.

An on-site substation (i.e., Solar One Substation [approximately 3 acres]) will be constructed to deliver the electrical power generated by the Project to the SCE Pisgah Substation. Approximately twelve to fifteen 220kV transmission line structures (90 to 110 feet tall) would be required to make the interconnection from the Solar One Substation to the SCE Pisgah Substation. All of these structures would be constructed within the Project Site.

The Project will include a centrally located Main Services Complex (14.4 acres) that includes three SunCatcher assembly buildings, administrative offices, operations control room, maintenance facilities, and a water treatment complex including a water treatment structure, raw water storage tank, demineralized water storage tank, basins, and potable water tank.

Adjacent to the Main Services Complex, a 14-acre temporary construction laydown area will be developed and an approximately 6-acre construction laydown area will be provided adjacent to the Satellite Services Complex south of the Burlington Northern Santa Fe (BNSF) railroad. Two additional construction laydown areas (26 acres each) one will be located at the south entrance off Hector Road and the other at the east entrance just north of the SCE Pisgah Substation.

Temporary construction site access would be provided off of I-40 beginning east of the SCE Pisgah Substation and would traverse approximately 3.5 miles across the Pisgah ACEC requiring an approximate 30-foot ROW. Long-term permanent access would be provided by a bridge over the BSNF railroad along Hector Road north of I-40. Equipment may be transported during construction via trucks and/or rail car (through the construction of a siding), that would be located on the north side of BNSF railroad and east of Hector Road or as authorized by BNSF.
Water would be provided via a groundwater well located on a portion of the BLM ROW grant north of the Main Services Complex and transported through an underground pipeline. The expected average well water consumption for the Project during construction is approximately 50 acre-feet per year. Under normal operation (inclusive of mirror cleaning, dust control, and potable water usage), water required will be approximately 36.2 acre-feet per year. Emergency water may be trucked in from local municipalities.

This section summarizes the potential environmental effects on water resources that could result from construction, operation, maintenance, and abandonment of the Project.

5.5.1 Affected Environment

This section describes the existing environment for water resources in the vicinity of the Project Site.

5.5.1.1 Hydrologic Setting

The Project Site lies within the Mojave Desert, and is part of the Great Basin. The Great Basin is a 200,000-square mile area that drains internally. All precipitation in the Great Basin evaporates, sinks underground or flows into lakes (mostly saline). Creeks, streams, or rivers find no outlet to either the Gulf of Mexico or the Pacific Ocean. The Great Basin is bounded by the Wasatch Mountains to the east, the Sierra Nevada to the west, and the Snake River Plain to the north. The south rim is less distinct.

The topography of the watershed is typical of the Basin and Range Province. The site lies along the edge of the valley at the foot of the Cady Mountains. As is typical with the basin and range system, the basin is bounded by the Pisgah and Lavic Lake Faults. Weathering and erosion from the mountain ranges over thousands of years has created a layer of sediment which has been deposited primarily by alluvial processes in the valley, mostly burying the bedrock (Stantec, 2008).

The Mojave Desert, including the Project Site, is located within the Newberry Springs Hydrologic Area of the Lower Mojave Hydrologic Unit, which covers approximately 318 square miles in Southern California. More specifically, the Project Site is within the Troy Valley Subarea and predominately overlays the Lower Mojave River Valley Groundwater Basin, with the site in the Troy Valley Groundwater Basin subarea. Troy Valley Groundwater Basin has been split at the Pisgah fault, which is a groundwater barrier, and has been incorporated into Lower Mojave River Valley and Lavic Valley groundwater basins (see Figure 5.5-1, Hydrologic Areas, and Figure 5.5-2, Groundwater Basins). The average annual precipitation at the site is approximately 4 to 6 inches.

The site is located northwest of the Pisgah Crater, also known as Pisgah Volcano. The volcano is the youngest vent in the Lavic Lake volcanic field. It is speculated that there may have been

activity at this site as recent as 2,000 years ago, though 20,000 to 50,000 years ago is more likely. The lava flows extend over 10 miles from the cone and are visible at the ground surface within portions of the Project Site (Stantec, 2008).
The Project Site is located on a sloping alluvial surface. Over the course of the site, slopes vary from about 2 percent to 6 percent and exhibit the characteristics of an alluvial pediment. The west side of the site and the areas south of the railroad are much flatter and slopes average about 1 percent. Off-site, the slopes in the mountainous area to the northeast of the Project range from 5 to 10 percent.

5.5.1.2 Groundwater Quality and Supply

Lavic Valley Groundwater Basin

The following information was obtained from California's Groundwater Bulletin 118.

The Project Site lies within the Lavic Valley Groundwater Basin. The basin is approximately 159 square miles and is bounded by nonwater-bearing rocks of the Cady Mountains on the north and east, of the Bullion Mountains on the south and east, of the Lava Bed Mountains on the southwest, and by the Pisgah fault on the west. Parts of the eastern and northern boundaries are drainage divides. The southern part of this basin lies within the Twenty-nine Palms Marine Corps Base. In the northern part of the basin, surface drainage is toward Hector Siding and in the southern part of the basin, surface drainage is toward Lavic (dry) Lake (DWR 2004; Rogers 1967). Groundwater may flow eastward out of the basin beneath a surface drainage divide.

Groundwater in the basin is found in Quaternary alluvial and lacustrine deposits. Holocene age **a**lluvium consists of unconsolidated, well-sorted, fine- to coarse-grained sand, pebbles, and boulders with variable amounts of silt and clay deposited in washes and alluvial fans (DWR 1967). Pleistocene age deposits are composed of gently tilted, unconsolidated to moderately consolidated, moderately well bedded gravel, sand, silt and clay (DWR 1967).

The principal recharge is derived from percolation of runoff from surrounding mountains through alluvial fans and washes (DWR 1967). Subsurface flow from adjoining basins may also contribute to recharge (DWR 1967).

Water from a well in the southern part of the basin near Lavic Lake sampled in 1917 was sodium sulfate in character with a TDS content of 1,680mg/L (DWR 1967; DWR 1954). Water from a well in the northeastern part of the basin sampled in the 1950s was sodium sulfate in character with a TDS content of 1,721mg/L. Water from a well in the northwestern part of the basin near Hector Siding sampled in the 1950s was calcium-sodium bicarbonate in character with a TDS content of 278mg/L.

5.5.1.3 Surface Water Quality

No perennial streams exist within the Project Site. The nearest perennial stream is the Mojave River, which is approximately 17 miles northwest of the western end of the site and does not pose a flooding hazard to the Project. The site is traversed by a number of ephemeral washes. These are normally dry streambeds, but may flow after significant rainfall. Washes fill up quickly during rains and there may be a sudden torrent of water, mud, and debris after a thunderstorm begins upstream.

All minor surface water drainages are listed for the following beneficial uses within the Lahontan Regional Water Quality Control Board (RWQCB): municipal and domestic supply, agricultural supply, groundwater recharge, water contact and noncontact recreation, warm freshwater habitat, cold freshwater habitat, and wildlife habitat uses.

5.5.1.4 Climate and Precipitation

As mentioned above, the average annual precipitation is approximately 5 inches in the area of the Project Site. The Project Site is approximately 37 miles east of the City of Barstow, which has an arid climate and an elevation roughly 2,200 feet above mean sea level. Table 5.5-1, Average Temperatures and Precipitation in City of Barstow (1980-2007), illustrates the average temperatures and precipitation for the area. Average annual humidity is 42 percent. Maximum recorded 24-hour precipitation for the City of Barstow is 1.57 inches (Stantec, 2008).

Table 5.5-1
Average Temperatures and Precipitation in City of Barstow (1980-2007)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Average Maximum Temperature (°F)	60.6	64.8	71.0	77.4	86.7	96.5	101.9	100.8	93.7	82.2	68.6	59.4	80.4
Average Minimum Temperature (°F)	34.4	38.0	42.7	43.4	55.1	63.0	68.9	67.7	61.0	51.1	40.8	33.3	50.4
Precipitation (inches)	0.82	0.93	0.69	0.22	0.09	0.06	0.32	0.25	0.31	0.30	0.46	0.53	4.97

Source: WRCC, 2008.
Note:
°F = degrees Fahrenheit

5.5.1.5 Water Supply and Use

According to the Lahontan RWQCB, Troy Valley groundwater, is the predominant water supply and is used for irrigation, industrial, domestic, and freshwater replenishment purposes. There is no perennial stream or surface water body in the vicinity of the Project Site. The nearest lake, Troy Lake, is a dry lake, and the Mojave River, approximately 17 miles west of the Project Site flows intermittently.

5.5.1.6 Wastewater Streams

No known sources of wastewater streams occur on the Project Site or are adjacent to the site.

5.5.1.7 Storm Water Runoff

Phase I

In general, the drainage in Phase I (500MW) of the Project area flows southwest from the Cady Mountains. However, along the south boundary of Phase I, some flows are diverted by the railroad and flow straight west.

There is an off-site watershed area of nearly 20 square miles which drains either directly to the Phase I Project Site or drains to the railroad tracks and is partially diverted into Phase I. The Phase I site is nearly 10 square miles so the total watershed area for Phase I is approximately 30 square miles. Approximately 10 blue line streams pass through the Phase I Project area. Several of these coalesce into larger washes, all of which drain to the railroad at the southern boundary of the Phase I site.

The runoff from Phase I flows through the existing trestles at the railroad. Photo 5.3-1, in the Initial Drainage Report, shows a typical trestle at the BNSF railroad. Some of the trestles may have insufficient capacity to pass 100-year flows; however, these flows are diverted west along the railroad on the southern boundary of the Project Site and eventually cross through trestles along the southern boundary of the Phase I site.

It is assumed that the 100-year flood will generally be conveyed along the railroad and through the trestles along the railroad right-of-way. This right-of-way is excavated and maintained by the BNSF Railroad to allow the water to pond and flow at low velocities. The right-of-way is delineated along the north line with a barbed wire fence.

The off-site watershed impacting Phase I emanates from the Cady Mountains which flank the northeast side of the Project Area. Field investigation and review of the topographic maps suggest that the watershed consists of a series of alluvial fans which coalesce to form a Bajada. A Bajada is the landform created by lateral merging and blending of a series of alluvial fans that form an undulary surface with decreasing down slope amplitude. From review of the topographic mapping in the field, it appears that the areas with the highest current risk of active flooding are generally shown on the USGS 7.5-minute quadrangles. These areas are indicated as blue lines and as shaded wash areas. While these areas are easily identifiable on the mapping, they may be occasionally difficult to identify in the field. Washes are often well incised near the base of the mountains. However, these same washes transition into sheet flow and shallow concentrated flow areas which do not have a well incised channel or with a series of small channels which are braided and all may carry a fraction of the total wash flow. Sheet flow is defined as flow of water as broad sheets that are unconfined by channel boundaries. Because the sheet flow and braided wash flow may carry a sediment load and follow unpredictable flow paths, development within these areas might be impacted by the storm water runoff. Sheet flow areas appear to be more prevalent at distal locations from the apex of the fan. These locations are primarily within the proposed site development area.

Phase II

The Phase I watershed, which emanates from the Cady Mountains, drains through the trestles on the railroad and then flows west through the Phase II site (350MW). This watershed has an area of nearly 30 square miles; however, the railroad embankment has diverted and channelized much of the flow creating numerous ponding areas upstream of the railroad trestles. The trestles and ponding areas attenuate the peak flow and allow most of the sediment to drop out on the upstream (north or east) side of the railroad embankment. Additional drainage flows south from

the Cady Mountains west of the Phase I property limits, is diverted at the railroad tracks, and then flows south in the Phase II area. This is an additional 10 square miles of watershed area.

In addition to the Cady Mountain watershed, a second watershed is located south of I-40 and includes the Pisgah Crater and lava flow area. Runoff from this watershed generally flows either north or west. It reaches the Interstate highway and then continues north through numerous culverts and bridges into the Phase II Project area. After flowing through the culverts along the highway, the runoff commingles with the flow from the Cady Mountains and then flows west to the outfall. This watershed is approximately 13 square miles. As with the Cady Mountain Watershed, the Pisgah Watershed is concentrated by the I-40 embankment and associated dikes and berms to be passed through culverts. Ponding occurs at these culvert locations and this reduces the peak flow and sediment loads which pass through the culverts.

In addition to these two off-site areas impacting Phase II, the Phase II Project Site area, which lies between the railroad tracks and the highway, is over six square miles. The total watershed area impacting the downstream end of Phase II is roughly 60 square miles.

5.5.1.8 Flooding Hazards

The Federal Emergency Management Agency's (FEMA's) Flood Insurance Rate Map (FIRM) has no panels for the Project. The Project is in an unmapped area; however, the area is designated as Zone D.

FEMA provides the following definition for Zone D:

The Zone D designation is used for areas where there are possible but undetermined flood hazards. In areas designated as Zone D, no analysis of flood hazards has been conducted. Mandatory flood insurance purchase requirements do not apply, but coverage is available. The flood insurance rates for properties in Zone D are commensurate with the uncertainty of the flood risk (Stantec, 2008).

5.5.2 Environmental Consequences

This section provides details on surface water and groundwater quality, the proposed water supply and use, wastewater discharge, and storm water runoff and flooding hazards.

5.5.2.1 Surface Water and Groundwater Quality

The ephemeral flood drainage paths that traverse the Project Site eventually drain toward Troy Lake, a dry lake bed. These flood drainage paths and Troy Lake are governed by the Lahontan RWQCB. No beneficial uses listed in the basin plan occur on the project site. While there are no specific water quality standards for the effluent of the Project, the water leaving the site must be of the same quality of the water before the Project was put in place.

Additional water quality testing will be preformed on the Project's groundwater source.

5.5.2.2 Water Supply and Use

Potential water supply sources evaluated for the Project included reclaimed water, surface water, groundwater, and obtaining water from a service provider.

Reclaimed water was not considered a viable option because of the lack of economically feasible supply source from wastewater treatment plant facilities in the area. The closest wastewater treatment plant facility is located 37 miles from the Project Site, within the City of Barstow.

Because of the distance to the wastewater treatment plant facility, the water would be required to be either piped or trucked in via approximately ten 5,000 gallon tanker trucks (to meet the average daily usage of 25.8 gallons per minute [gpm]) over a long distance and treated on-site for a variety of chemical and biological constituents not generally present in the Project Site area, which would likely offset environmental gains from the water quality standpoint. Storm water runoff capture and storage was not considered a reliable source of water supply because of the limited amount of rainfall available for storage, the sporadic nature of rainfall in the region, and engineering and logistical issues related to providing surface water storage ponds capable of providing reliable adequate long term supply.

The final long-term potential water sources considered for the Project include groundwater from one or more on site wells. The primary well(s) will be capable of supplying the peak operations demand, currently estimated at 43.7 gpm.

Proposed Water Supply Source

The water from the primary well is characterized as raw water, and will require treatment to remove dissolved solids for SunCatcher mirror wash water applications and additional treatment to meet standard drinking water quality requirements. The water will be required to be demineralized to prevent mineral deposits forming on the SunCatcher mirrors. Processes available for demineralization are Reverse Osmosis (RO) and ion exchange. Appendix J, Water Balance Flow Diagrams, shows the water mass balance diagram and a water supply schematic. The Water Balance Flow Diagram will be provided in a future Project submittal.

Potable water, well water treatment, and SunCatcher mirror washing under regular monthly maintenance routines will require approximately 25.8gpm of well water per day. A maximum requirement of approximately 43.7gpm of well water per day will be needed during the months when each SunCatcher receives a scrub wash. Table 5.5-2, Operations Water Usage Rates, summarizes the water usage rates.

Table 5.5-2
Operations Water Usage Rates

Water Use	Daily Average (gallons per minute)	Daily Maximum (gallons per minute)	Annual Usage (acre feet)
Equipment Water Requirements			
SunCatcher Mirror Washing	11.8[1]	19.7[2]	16.1[3]
Water Treatment System Discharge			
Brine to Evaporation Ponds	6.0	11.1[4]	8.1
Potable Water Use			
For drinking and sanitary water requirements	3.8[5]	4.6[6]	5.2[7]
Dust Control			
Well water for dust control during operations	4.2[8]	8.3[9]	6.7[10]
Totals	**25.8**	**43.7**	**36.2**

Table 5.5-2
Operations Water Usage Rates

Source: Stirling Energy Systems, Inc.

[1] Based on 34,000 SunCatchers requiring a monthly wash with an average of 14 gallons of demineralized water per spray wash and a five-day work week (21 work days per month).

[2] During a three month period, all SunCatcher mirrors are given a scrub wash requiring up to three times the normal wash of 14 gallons per SunCatcher. Therefore, the Daily Maximum usage rate is based on 2/3 of the SunCatchers receiving a normal wash and one third receiving a scrub wash.

[3] Based on every SunCatcher having approximately 8 normal washes per year with one additional scrub wash.

[4] Based on the maximum amount of demineralized water required for mirror washing and assumes a decrease in raw water quality requiring an additional 20 percent of system discharge.

[5] Assumes 30 gallons per person per day for 182 people.

[6] Maximum amount assumes a 20 percent contingency over the Daily Average.

[7] Assumes a six-day work week and average daily usage.

[8] Assumes 5,000 gallons per day.

[9] Assumes up to 10,000 gallons per day.

[10] Assumes daily average dust control operations.

Water for domestic use will meet the standards adopted by the Environmental Protection Agency. Bottled water may be considered for drinking water in place of a potable water treatment system.

Water Use Comparison

Table 5.5-3, Comparison of Water Usage Rates, provides estimates of typical water use for other land uses in the area as well as water use data for other types of power generating facilities. The table provides typical water use per acre for other land uses and water use per MW of power generation for other types of generating facilities. The water usage rates shown in the table indicate the Project will require significantly less water than other power generating facilities as well as other land use types. Therefore, the proposed water use is anticipated to be a less than significant effect on water resources in the area.

As a comparison, data from an Application for Certification(AFC) for a proposed 750 MW combined-cycle generating facility states a requirement of a total 5,400 acre-feet water per year at an annual average of 3,300 gallons per minute (gpm) at a 99 percent capacity factor. The proposed facility will require this same volume of water for equipment makeup, including makeup to the cooling tower, the combustion turbine inlet air evaporative cooler, and the heat recovery steam generator, along with potable water makeup for sanitary uses and plant utility stations. Solar One's water needs are several orders of magnitude less than what is required for a comparable traditional energy generation facility.

Table 5.5-3
Comparison of Water Usage Rates

Activity/Property Use	Water Use
Power Generation	
Solar One (36.2afy with 850MW)	0.044afy/MW
Solar Thermal, Dry Cooling (Carrizo Energy Solar Farm Compact Linear Fresnal Reflector- Not Yet Constructed)[a]	0.1 afy/MW
Solar Concentrating Thermal Power (Ivanpah Solar Electric Generating System - Not Yet Constructed)[a]	0.25afy/MW

Table 5.5-3
Comparison of Water Usage Rates

Activity/Property Use	Water Use
Victorville 2 Solar Hybrid (Not Yet Constructed)[a]	5.6afy/MW
Solar Thermal (Parabolic Trough), Wet Cooling[b]	6 to 13afy/MW
Conventional Coal-fired[c]	11.2afy/MW
Land Uses	
Solar One (36.2afy)	36.2 afy or 0.004 af/acre
Single Family Residential[d]	0.52afy
Commercial/Institutional[d]	1.66afy
Urban[e]	3.2af/acre
Industrial[d]	6.2 afy
Agricultural	
Spinach[f]	0.5 to 2.0af/acre
Corn[e]	2.4af/acre
Tomatoes[e]	3.9af/acre
Lettuce[f]	4af/acre
Cotton[e, g]	3.2 to 5.0af/acre
Alfalfa[e,b]	4.7 to 5.5af/acre
Carrots[f]	5.8af/acre

Sources:
[a] California Energy Commission, ttp://www.energy.ca.gov/sitingcases/ivanpah/index.html;
[b] National Renewable Energy Laboratory, Parabolic Trough FAQs, www.nrel.gov;
[c] A 880-MW plant reportedly uses an average of 11 million gallons per day, of which 80 percent is lost to atmosphere as steam (www.deq.virginia.gov);
[d] Integrated Water Resources Plan, MWD, Report No. 1107, March 1996, from Southern California Association of Governments and San Diego Association of Governments;
[e] California Department of Water Resources, The California Water Plan Update, Bulletin 160-98. Value appearing for San Joaquin Valley unless noted;
[f] www.vric.ucdavis.edu;
[g] "Power Plants in Arizona--an Emerging Industry, a New Water User," http://ag.arizona.edu.

Notes:
af = acre-feet
afy = acre-feet per year
MW = megawatt

5.5.2.3 Wastewater Discharge

A water treatment building will be constructed as part of the Main Services Complex. The building will contain equipment for processing and treating water required for fire protection, SunCatcher mirror washing, and potable water uses. The building will contain the water treatment system, an analytical laboratory area, a separate bulk chemical storage area for the water treatment process, and a separate electrical motor control center room.

The wastewater generated by the RO unit will contain relatively high concentrations of TDS. Wastewater or brine generated by the RO unit will be discharged to two double-lined evaporation ponds or equivalent. Each pond will be sized to contain 1-year of discharge flow (approximately 3-million gallons). A minimum of 1 year is required for the waste to undergo the evaporation process. The second pond will be placed into operation while the first is undergoing evaporation. The two ponds will alternate their functions on an annual basis.

The brine constituents in the wastewater include those from the well water source, resulting in concentrations of up to four to five times than that found in the well water source. The TDS anticipated in the brine when treating to less than 20mg/L TDS is approximately 3,600mg/L based on an assumed source TDS level of 810mg/L.

After the brine has gone through the evaporation process, the solids that settle at the bottom of the evaporation pond will be tested by the Applicant and disposed of in a landfill or recycled. Solids buildup in these ponds will be scheduled for removal during the summer months for maximum solids removal and will be disposed by legally accepted methods.

Sanitary wastewater generated at the Project cannot be conveyed to an existing sewage facility. No public or private entities manage sanitary wastewater flows for locations in the vicinity of the Project Site. A local, site-specific, small wastewater treatment plant and in-ground septic system will be constructed to handle sanitary wastewater. A facility of this type will be designed to meet the requirements of the local RWQCB and the San Bernardino County Public Health Department, and will meet operation and maintenance guidelines required by the California Department of Public Health.

SunCatcher mirror washing will be ongoing throughout the life of the Project. Washing will be carried out approximately 11 times per year for each SunCatcher mirror using demineralized water, and one time per year. Depending on the atmospheric conditions, the heat conductivity of the mirror, and the time of day, it is expected that most of the water used to clean the mirror surface will evaporate before reaching the ground surface. Incidental wash water reaching the ground surface will evaporate quickly and the highly diluted soap solution will biodegrade. Therefore, it is not currently anticipated that any proposed detention, infiltration, or evaporation ponds will be used for process wastewater disposal. No significant effects are anticipated to soil chemistry, surface water, or groundwater quality from mirror washing.

5.5.2.4 Storm Water Runoff and Flooding Hazards

Storm runoff is estimated using a rainfall-runoff modeling procedure which utilizes the unit hydrograph procedures, guidelines and criteria presented in the San Bernardino County Hydrology Manual (Manual). Analysis is done using Advanced Engineering Software3 (AES) to calculate stormwater runoff rates coming from the watershed and flowing through the Project Site.

The Initial Drainage Report (Appendix N) illustrates the drainage patterns for pre- and post-Project conditions. Existing drainage patterns can be seen in Figure 5.5-3. The Project will not adversely affect existing drainage features. The existing flooding patterns will remain once the Project is constructed. The proposed flood plain map is shown in Figure 5.5-4.

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The Initial Drainage Report also documents the methods and calculations used to tabulate the flows and flooding hazards for the Project Site. These flows are listed in Table 5.5-4. The results of the hydraulic analysis are interpreted and plotted on Figure 5.5-4, Flood Plain Map.

Table 5.5-4 Project Flows for 25 and 100 Year Storms

Basin	Node	Area (ac)	Q_{25} (cfs)	Q_{100} (cfs)	Comment
1A	11	1,102	913	1,442	
1B	12	304	1,103	1,776	
1C	13	293	2,262	3,615	At Railroad
2A	21	917	798	1,242	
2B	22	272	985	1,564	At construction laydown area
3A	31	997	1,103	1,702	
3B	32	761	1,723	2,698	At Hector Road
3C	33	310	1,791	2,927	At Railroad
4A	41	1,687	1,738	2,654	
4B	42	826	2,408	3,740	At Hector Road
4C	43	549	2,829	4,391	At Railroad
5B	52	452	2,117	3,316	At Hector Road
5C	53	495	2,440	3,822	
6A	61	1,426	1,745	2,651	
6B	62	107	1,875	2,856	
6C	64	366	483	733	
6D	62	93	590	903	
6E	65	353	2,680	4,141	At Hector Road
6F	66	166	2,745	4,253	At Railroad
6G	68	254	337	512	At site boundary
6H	69	556	906	1,429	Hector Road Upstream of Main Admin. Complex
6I	66	246	1,088	1,699	
6J	66.5	246	3,806	6,000	
7A	71	291	386	585	
7B	72	328	744	1,170	At Hector Road

Basin	Node	Area (ac)	Q_{25} (cfs)	Q_{100} (cfs)	Comment
7C	73	246	900	1,462	At Primary Access Road
7D	76	487	509	800	
7E	77	305	863	1,364	At Hector Road
7F	78	304	1,048	1,627	At Primary Access Road
7G	79	442	2,216	3,576	At Railroad
8A	81	351	413	632	At Hector Road
8B	82	1,070	1,309	2,025	At Railroad
9A	91	1,426	1,293	1,963	At site boundary
9B	92	3,747	3,650	5,624	
9C	93	1,558	4,512	6,974	
480	484	370	308	482	At highway
490	494	83	155	238	
500	504	2,473	1,820	2,842	
510	514	102	154	239	
520	524	158	298	440	
530	534	655	548	807	At highway
540	544	2,381	1,243	1,920	At highway
550	558	1,042	2,982	4,504	
560	564	155	257	397	At highway
570	574	223	357	553	At highway
590	594	207	307	475	At highway
600	604	497	659	1,024	At highway
610	614	202	336	518	At highway
620	624	103	162	250	At highway
630	634	46	116.5	177	At highway
650	654	3,283	1,189	1,860	At highway bridge on west end
660	668	361	1,129	1,847	
670	676	126	9,684	11,565	Flows north through railroad trestle
680	688	562	824	1,291	At Hector Road
720	728	336	2,686	4,099	
730	738	199	1,374	1,896	At outfall
740	748	288	2,727	4,181	At outfall
750	758	114	1,412	2,174	At Hector Road

Basin	Node	Area (ac)	Q_{25} (cfs)	Q_{100} (cfs)	Comment
760	768	205	1,466	2,269	
770	778	239	1,413	1,908	
780	789	895	9,694	11,608	

5.5.3 Cumulative Effects

Cumulative effects for water resources were evaluated on a surface watershed and groundwater aquifer basis. The total watershed area of the Project is approximately 90 square miles for Phase I and Phase II, which lie within the 200,000 square mile Great Basin. The Project occupies an insignificant proportion of the total watershed area (less than 0.01 percent) and because on-site effects are less than significant the Project is not expected to result in significant cumulative effects to water resources during construction or operation. Additionally, because of the relatively limited change in surface topography there will be a less than significant effect on surface water flooding limits and duration in the area.

The groundwater basin is reasonably isolated by the Pisgah fault and Cady Mountain Range. A groundwater model for basin drawdown will be provided for the Project. The Project will pump at a daily average rate of 25.8 gpm. The result is 36.2 acre-feet of water per year, which is a minor portion of the amount of water in storage for the Lavic Groundwater basin (recharge for the basin is 300 af/yr). No significant cumulative effects on groundwater are anticipated.

In relation to other land uses and power generating facilities, the Project water use is significantly lower in comparison based upon per acre and per MW water usage rates as illustrated in Table 5.5-3, Comparison of Water Usage Rates. In terms of power generating facilities, the Project's water use rate is approximately 0.044 acre-feet per year/MW compared to approximately 0.1 acre-feet per year/MW for the next most efficient solar electric generating technology (solar thermal compact linear Fresnal reflector system), and 11 acre-feet per year/MW for a conventional coal-fired power generating facility. In terms of land use, the Project's water use rate is approximately 0.004 acre-feet per year per acre (36.2 acre-feet per year over 8,230 acres) compared to average uses of 0.52 acre-feet per year for single family residential, and 1.55 acre-feet per year for general industrial/commercial operations (UCR 2000). Based upon the projected annual water usage rate per acre it is not anticipated that the Project will significantly increase cumulative effects to water use within San Bernardino County. In addition, the Project Site would be designed to minimize effects on erosion and sedimentation below the Project Site and would therefore not be expected to have cumulative effects on the watershed when considered together with other foreseeable potential projects.

5.5.4 Mitigation Measures

Mitigation measures for water resources will be applied in situations where the Project has or would have an unmitigated significant effect. As discussed above, the evaluation of water resources effects considers both the occurrence and the quality of water in the area. For the occurrence of groundwater in the area, the Project will have minimal significant effect on the depth to water in the aquifer or groundwater quality because the Project is in a small, isolated groundwater basin. Furthermore, after implementation of the Project water resource features

described in Section 5.5.2, Environmental Consequences, the Project will not have a significant effect on water quality in the area or surface water runoff flowrates, volumes, or floodplain effects. Thus, no mitigation is required for water resources.

5.5.5 Compliance with LORS

The construction and operation of the Project will be conducted in accordance with all federal, state, county and local laws, ordinances, regulations, and standards (LORS) applicable to water resources. Applicable LORS are also summarized in Table 5.5-5 below.

5.5.5.1 Federal

Clean Water Act of 1977 (including 1987 amendments) Section 402; 33 United States Code Section 1342; 40 Code of Federal Regulations Parts 122–136

The Clean Water Act (CWA) requires a National Pollutant Discharge Elimination System (NPDES) permit for any discharge of pollutants from a point source to Waters of the U.S. This law and its regulations apply to storm water and other discharges into Waters of the U.S. The CWA requires compliance with a general construction activities permit for the discharge of storm water from construction sites disturbing 0.5 acre or more. This federal permit requirement is administered by the SWRCB.

Construction activities at the Project Site will be performed in accordance with a Storm Water Pollution Prevention Plan (SWPPP) and associated monitoring plan that is required in accordance with the NPDES General Permit for Storm Water Discharges Associated with Construction Activities, which is issued by the SWRCB. The SWPPP will provide control measures, including BMPs to reduce erosion and sedimentation as well as other pollutants associated with vehicle maintenance, material storage and handling, and other activities occurring at the Project Site. The administering agencies for the above authority are the SWRCB and the Lahontan RWQCB.

Clean Water Act Section 311; 33 United States Code Section 1342; 40 Code of Federal Regulations Parts 122–136

This portion of the CWA requires the reporting of any prohibited discharge of oil or hazardous substance. The Project will conform by proper management of oils and hazardous materials, both during construction and operation phases. The administering agency is the Lahontan RWQCB and the California Department of Toxic Substances Control.

Title 40 Code of Federal Regulations Parts 124, 144 to 147

This portion of the Code of Federal Regulations (CFR) requires protection of underground water resources. The Project will comply with this requirement through the use of a lined evaporation pond for RO discharge water.

5.5.5.2 State

California Water Code Section 13552.6

This portion of the California Water Code relates to the use of potable domestic water for cooling towers, air conditioning devices, and floor trap priming. No cooling towers are proposed as part of the Project.

State Water Resources Control Board, Resolution 75-58 (June 18, 1975)

The SWRCB prescribes state water policy on the use and disposal of inland water used for power plant cooling. No cooling towers are proposed as part of the Project.

California Porter-Cologne Water Quality Control Act 1998; California Water Code Section 13000–14957; Division 7, Water Quality

The Porter-Cologne Water Quality Control Act authorizes the state to develop and implement a statewide program for the control of the quality of all waters of the state. The Act establishes the SWRCB and the nine RWQCBs as the principal state agencies with primary responsibility for the coordination and control of water quality. Under § 13172, siting, operation, and closure of waste disposal sites are regulated. The SWRCB requires classification of the waste and the disposal site. Discharges of waste must comply with the groundwater protection and monitoring requirements of the Resource Conservation and Recovery Act of 1976, as amended (42 United States Code [USC] Sec. 6901 *et seq.),* and any federal acts that amend or supplement the Resource Conservation and Recovery Act of 1976, together with any more stringent requirements necessary to implement this revision or Article 9.5 (commencing with Section 25208) of Chapter 6.5 of Division 20 of the Health and Safety Code. Project will comply with the regulations set forth in this Act.

The administering agencies for the above authority are the CEC, SWRCB, and the Lahontan RWQCB.

Title 22, CCR Division 4, Chapter 3

This regulation requires maximum use of reclaimed water in the satisfaction of requirements for beneficial uses of water. The Project satisfies this requirement in that it complies with the Lahontan RWQCB Water Quality Control Plan (2006). The administering agency is the Lahontan RWQCB.

California Water Code, Section 5002

This requirement relates to the extraction of groundwater and requires that a Notice of Extraction and Diversion of Water be filed with the SWRCB. This requirement applies for extractions greater than 25 acre-feet/year. The administering agency is the Lahontan RWQCB. The Project will comply with code as applicable. .

California Water Code, Section 13751

This is a requirement for a Report of Well Completion to be filed with the Lahontan RWQCB within 60 days of well completion. Reports will be filed in the future.

California Public Resources Code Section 25523(a); 20 CCR Sections 1752, 1752.5, 2300-2309 and Chapter 2 Subchapter 5 Article 1, Appendix B, Part (1)

The code provides for the inclusion of requirements in the CEC's decision on an AFC to ensure protection of environmental quality and require submission of information to the CEC concerning proposed water resources and water quality protection. The administering agency for the above authority is the CEC.

California Water Code Sections 13271–13272; 23 California Code of Regulations Sections 2250–2260

These code sections require reporting of releases of specified reportable quantities of hazardous substances or sewage (Section 13272), when the release is into, or where it will likely discharge into, waters of the state. For releases into or threatening surface waters, a "hazardous substance" and its reportable quantities are those specified at 40 CFR 116.5, pursuant to Section 311(b)(2) of the CWA (33 USC 1321(b)(2)). For releases into or threatening groundwater, a "hazardous substance" and its reportable quantities are those specified at 40 CFR 116.5, pursuant to Section 311(b)(2) of the CWA (33 USC 1321(b)(2)). For releases into or threatening groundwater, a "hazardous substance" is any material listed as hazardous pursuant to the California Hazardous Waste Control Act, Health and Safety Code, Sections 25100–2520.24, and the reportable quantities are those specified at 40 CFR Part 302. Although such releases are not anticipated, the Project would comply with the reporting requirements.

The administering agencies for the above authority are the Lahontan RWQCB and the California Office of Emergency Services.

California Water Code Sections 13260–13269; 23 California Code of Regulations Chapter 9

The code requires the filing of a Waste Discharge Requirements (WDR) and provides for the issuance of WDRs with respect to the discharge of any waste that can affect the quality of the waters of the state. The WDRs will serve to enforce the relevant water quality protection objectives of the San Bernardino County Basin Plan and federal technology-based effluent standards applicable to the Project. With respect to potential water pollution from construction activities, the WDRs may incorporate requirements based on the CWA § 402(p) and implementing regulations at 40 CFR Parts 122 *et seq.*, as administered by the Lahontan RWQCB. The administering agency for the above authority is the Lahontan RWQCB.

California Environmental Quality Act, Public Resources Code Section 21000 et seq.; California Environmental Quality Act Guidelines, 14 California Code of Regulations Section 15000 et seq.; Appendix G

Appendix G of the California Environmental Quality Act Guidelines contain definitions of projects that can be considered to cause significant unmitigated effects to water resources. The Project is not expected to cause significant effects on water resources, as described in Section 5.5.2, Environmental Consequences. The administering agency of the above authority is the CEC.

Title 27, California Code of Regulations Division 2. Section 20375. State Water Resources Control Board – Special Requirements for Surface Impoundments. (C15: Section 2548)

This regulation governs the design requirements for surface impoundments. The evaporation pond for wastewater disposal will be designed and operated in accordance with the requirements of this section.

California Energy Commission Water Use Policy

The CEC follows statewide water use policy regulations identified in the preceding subsections.

The report titled "California's Water - Energy Relationship," prepared in support of the "Integrated Energy Policy Report Proceeding (04-IEPR-01E)," dated November 2005, the CEC provides background information on statewide water usage and indicates that the CEC supports state water use policies.

In addition to the above document, in a memorandum dated 2 September 2003, from the CEC to the State Integrated Energy Policy Committee, CEC staff provided a summary and recommendation for how the CEC should implement existing state water policy in the power plant certification cases it considers. The recommendation was based, in large part, on staff's experience and recommendations on individual power plant siting cases recently before the CEC. In a document entitled, "Docket No. 02-IEP-1, Staff Comments, State Water Policy, Background and Recommendations for Implementation," CEC staff present background on state water use policies and provide recommendations for CEC implementation. The overall finding by CEC staff was that because power plants have the potential to use substantial amounts of water for evaporative cooling, the Commission has the opportunity and the responsibility to apply state water policy to minimize the use of fresh water and promote alternative cooling technologies.

In summary, the CEC staff recommendations were:

> "...the Energy Commission should extend to cases under the Commission's jurisdiction the principle enunciated by the State Water Board regarding the use of fresh water only where alternative water supply sources and alternative cooling technologies are shown to be "environmentally undesirable" or "economically unsound." Additionally, as a way to reduce the use of fresh water and to avoid discharges in keeping with the Board's policy, the Energy Commission should promote zero-liquid discharge (ZLD) technologies unless ZLD technologies are shown to be "environmentally undesirable" or "economically unsound." To clarify the principle as it applies to cases before the Energy Commission, the Commission could interpret "environmentally undesirable" to mean the same as having a "significant adverse environmental impact" and "economically unsound" to mean the same as "economically or otherwise infeasible."
>
> In effect, the Energy Commission would be implementing the state's water policy by approving the use of fresh water for powerplant cooling only if the use of alternative water supply sources or alternative cooling methods would cause a significant adverse environmental impact or are economically or otherwise infeasible. If an applicant proposes to use fresh water for cooling, the applicant would have the burden of justifying the use of fresh water by demonstrating with substantial evidence that alternative water sources and alternative cooling methods either cause a significant adverse environmental impact or are economically or otherwise infeasible. In furtherance of state water policy, the Energy Commission would also expect an applicant to use ZLD technology to

eliminate discharge wastewater from the proposed site unless the applicant demonstrates that ZLD technologies would cause a significant adverse environmental impact or are economically or otherwise infeasible."

5.5.5.3 Local

San Bernardino County Code, Title 8, Sections 82.06.020 - 82.06.060.

The Project is classified as industrial development and as such will conform to the requirements of Section 82.06. These requirements include the permitted and prohibited uses within the limits of the Project as well as setbacks, height limits, distances between structures, parking, landscaping, and signage.

San Bernardino County Code, Title 8, Sections 83.15.020 - 83.15.070.

This ordinance ensures compliance with conditions of approval on projects involving Water Quality Management Plan features. The Project may need to have a Water Quality Management Plan on-site in operational stages.

Table 5.5-5
Summary of LORS – Water Resources

LORS	Requirements	Conformance Section	Administering Agency	Agency Contact
Federal Jurisdiction				
CWA §402; 33 USC §1342; 40 CFR Parts 110, 112, 116	Requires NPDES Permits for construction and industrial storm water discharges. Requires preparation of a SWPPP and Monitoring Program.	Coverage under NPDES industrial storm water permit maybe required. NOI for coverage under NPDES construction storm water permit will be filed before construction.	SWRCB and RWQCB	M. Plaziak
CWA §311; 33 USC §1342; 40 CFR Parts 122-136	Requires reporting of any prohibited discharge of oil or hazardous substance.	Project will conform by proper management of oils and hazardous substances both during construction and operation. If an accidental release or unintended spill occurs it will promptly be reported.	RWQCB and DTSC	M. Plaziak
CFR, Title 40, Parts 124, 144 to 147	Requires protection of underground water resources	Underground water resources will be protected due to the lined evaporation pond.	Environmental Protection Agency	
State Jurisdiction				
CWC §13552.6	Use of potable domestic water for cooling towers and air conditioning is unreasonable use if suitable recycled water is available.	Recycled water is not available in the vicinity of the Project Site. Additionally, no cooling towers are proposed.	SWRCB and RWQCB	M. Plaziak
California Constitution Article 10 §2	Avoid the waste or unreasonable uses of water. Regulates methods of use and diversion of water.	Project includes appropriate water conservation measures, both during construction and operation.	SWRCB and RWQCB	M. Plaziak

Table 5.5-5
Summary of LORS – Water Resources

LORS	Requirements	Conformance Section	Administering Agency	Agency Contact
State Water Resources Control Board, Resolution No. 75-58	Addresses sources and use of cooling water supplies for power plants that depend on inland waters for cooling and in areas subject to general water shortages.	Recycled water is not available at the Project Site. Moreover, no cooling towers are proposed.	SWRCB and RWQCB	M. Plaziak
Porter-Cologne Water Quality Act of 1972; CWC § 13000-14957, Division 7, Water Quality	Requires State and Regional Water Quality Control Boards to adopt water quality initiatives to protect state waters. Those criteria include identification of beneficial uses, narrative and numerical water quality standards.	Project will conform to applicable state water standards, both qualitative and quantitative, before and during operation. Applicable permits will be obtained from Regional Water Quality Control Board.	SWRCB and RWQCB	M. Plaziak
Title 22, CCR	Addresses the use of recycled water for cooling equipment	Project has investigated the technical and economic feasibility of using reclaimed water and determined that this resource is not available.	California Department of Health Services	J. Stone
The Safe Drinking Water and Toxic Enforcement Act of 1986 (proposition 65), Health and Safety Code 25241.5 *et seq*.	Prohibits the discharge or release of chemicals known to cause cancer or reproductive toxicity into drinking water sources.	Project will conform to all state water quality standards, both qualitative and quantitative. Project will not discharge into any drinking water source. If an unintended spill occurs, reporting of spill will be prompt.	California Department of Health Services	J. Crisologo
CWC Section 461	Encourages the conservation of water resources and the maximum reuse of wastewater, particularly in areas where water is in short supply.	Project has investigated the technical and economic feasibility of using reclaimed water and determined that it is not available.	SWRCB and RWQCB	M. Plaziak
CWC Section 5002	Requires a "Notice of Extraction and Diversion of Water" to be filed with the State Water Resources Control Board on or before 1 March of the succeeding year.	Notice will be filed as required by state law.	SWRCB and RWQCB	M. Plaziak
CWC Section 13751	Requires a "Report of Completion" to be filed with the State Water Resources Control Board within 60 days of well construction.	A groundwater well is not proposed.	SWRCB and RWQCB	M. Plaziak
California Public Resources Code §25523(a); 20 CCR §§1752, 1752.5, 2300 – 2309, and Chapter 2 Subchapter 5, Article 1, Appendix B, Part 1	The code provides for the inclusion of requirements in the CEC's decision on an AFC to assure protection of environmental quality and requires submission of information to the CEC concerning proposed water resources and water quality protection.	Project will comply with the requirements of the CEC to assure protection of water resources.	CEC and RWQCB	

Table 5.5-5
Summary of LORS – Water Resources

LORS	Requirements	Conformance Section	Administering Agency	Agency Contact
CWC §§ 13271 – 13272; 23 CCR §§2250 – 2260	Reporting of releases of reportable quantities of hazardous substances or sewage and releases of specified quantities of oil or petroleum products.	No releases of hazardous substances are anticipated; however, Project will conform to all State water quality standards, both qualitative and quantitative. If an unintended spill occurs, reporting of spill will be prompt.	SWRCB and RWQCB	M. Plaziak
CWC §13260 – 13269; 23 CCR Chapter 9	Requires the filing of a Report of Waste Discharge and provides for the issuance of WDRs with respect to the discharge of any waste that can affect the quality of the waters of the state.	An ROWD will be filed for the RO Unit discharge waste. The RO Unit will be constructed and monitored in accordance with RWQCB requirements.	SWRCB and RWQCB	M. Plaziak
CEQA, Public Resources Code §21000 *et seq.*; CEQA Guidelines, 14 CCR §15000 *et seq.*; Appendix G	The CEQA Guidelines (Appendix G) contain definitions of projects that can be considered to cause significant effects to water resources.	Project will comply with the requirements of the CEC to assure protection of water resources.	CEC	
Title 27, CCR Division 2, §20375, SWRCB – Special Requirements for Surface Impoundments (C15: §2548)	This regulation governs the design requirements for surface impoundments.	The evaporation pond for wastewater disposal will be designed and operated in accordance with the requirements of this section.	SWRCB and RWQCB	M. Plaziak
Local Jurisdiction				
San Bernardino County Code, Title 8	The ordinance classify the Project as industrial development and regulates its uses	The Project will conform to all code standards	San Bernardino County	G. Kim
San Bernardino County Code, Title 8	Ensures compliance of Water Quality Management Plan features.	The Project may develop, if necessary, a Water Quality Management Plan	San Bernardino County	G. Kim

Source: URS Corporation, 2008.

Notes:

APCD	=	Air Pollution Control District
CEQA	=	California Environmental Quality Act
CFR	=	Code of Federal Regulations
CWA	=	Clean Water Act
CWC	=	California Water Code
LORS	=	laws, ordinances, regulations, and standards
NOI	-	Notice of Intent
NPDES	=	National Pollutant Discharge Elimination System
RWQCB	=	Regional Water Quality Control Board
SWRCB	=	State Water Resources Control Board
SWPPP	=	Storm Water Pollution Prevention Plan
USC	=	United States Code

5.5.5.4 Agencies and Agency Contacts

Agencies with jurisdiction to issue applicable permit and/or enforce LORS related to water resources are shown in Table 5.5-6, Agency Contact List for LORS.

Table 5.5-6
Agency Contact List for LORS

Agency	Contact	Title	Telephone
California Regional Water Quality Control Board, Lahontan Region	Mike Plaziak Victorville, CA 92392	Supervising Engineering Geologist	760 241-7325
California Department of Health Services	Jeff Stone	Recycled Water	805-566-9767
California Department of Health Services	Joseph Crisologo	Water Security	213-580-5723
California Department of Water Resources, Division of Planning and Local Assistance, Southern District	Tim Ross		818-500-1645
San Bernardino County, Land Development	Gia Kim	Chief	909-387-8145

Source: Lahontan Basin RWQCB, 2008; CDPH, 2008a; CDPH, 2008b.

5.5.5.5 Permits Required and Permitting Schedule

The permits required for this Project are listed in Table 5.5-7, Applicable Permits.

Table 5.5-7
Applicable Permits

Responsible Agency	Permit/Approval	Schedule
U.S. Army Corps of Engineers	Corps issues a Section 404 permit, including a nationwide permit or an individual permit for actions that result in a fill or discharge to federal jurisdictional Waters of the U.S.	Applicability and schedule to apply to be identified in Section 5.6, Biological Resources.
Lahontan Basin RWQCB	RWQCB issues a 401 Water Quality Certification or Waiver.	Agency consultation and permit approval or waiver before construction.
SWRCB and RWQCB	NPDES Permit – Prepare Industrial SWPPP.	Complete initial Industrial SWPPP and file Notice of Intent with SWRCB 60 days before operation. Submit copy of SWPPP and Notice of Intent to CEC 30 days before operation (or letter from RWQCB exempting the Project from NPDES Industrial Permit requirements).
SWRCB and RWQCB	NPDES Permit – Prepare Construction SWPPP.	Complete initial Construction SWPPP and file Notice of Intent with SWRCB 60 days before operation. Submit copy of SWPPP and Notice of Intent to CEC 30 days before operation.
Lahontan River Basin RWQCB	Application for coverage under Order No. R6T-2003-0004, Waste Discharge Requirements General Permit for Discharges with Low Threat to Water Quality or issuance of site specific WDR.	Apply for WDR coverage with RWQCB during improvement plan preparation process before start of construction.

Source: Lahontan RWQCB, 2008; SWRCB, 2008; United States Army Corps of Engineers, 2008.
Notes:
NPDES = National Pollutant Discharge Elimination System
RWQCB = Regional Water Quality Control Board

Table 5.5-7
Applicable Permits

Responsible Agency	Permit/Approval	Schedule

SWPPP = Storm Water Pollution Prevention Plan
SWRCB = State Water Resources Control Board
WDR = Waste Discharge Report

5.5.6 References

CDPH (California Department of Public Health). 2008a. <http://www.cdph.ca.gov/HealthInfo/environhealth/water/Pages/Waterrecycling.aspx>

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WRCC (Western Regional Climate Center) Website. 2008. Barstow Fire Station. http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca0521, last accessed 19 May 2008.

Adequacy Issue:	Adequate		Inadequate		**DATA ADEQUACY WORKSHEET**		Revision No.	0	Date	
Technical Area:	**Water Resources**				Project:	SES Solar One		Technical Staff:		
Project Manager:					Docket:			Technical Senior:		

SITING REGULATIONS	INFORMATION	AFC SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (g) (1)	...provide a discussion of the existing site conditions, the expected direct, indirect and cumulative impacts due to the construction, operation and maintenance of the project, the measures proposed to mitigate adverse environmental impacts of the project, the effectiveness of the proposed measures, and any monitoring plans proposed to verify the effectiveness of the mitigation.	Section 5.5		
Appendix B (g) (14) (A)	All the information required to apply for the following permits, if applicable, including:	See Below		
Appendix B (g) (14) (A) (i)	Waste Discharge Requirements; National Pollutant Discharge Elimination System Permit; and/or a Section 401 Certification or Waiver from the appropriate Regional Water Quality Control Board (RWQCB);	Section 5.5.5.5 Table 5.5-7		
Appendix B (g) (14) (A) (ii)	Construction and Industrial Waste Discharge and/or Industrial Pretreatment permits from wastewater treatment agencies;	Section 5.5.5.2		
Appendix B (g) (14) (A) (iii)	Nationwide Permits and/or Section 404 Permits from the U.S. Army Corps of Engineers; and	Section 5.5.5.5 Table 5.5-7		
Appendix B (g) (14) (A) (iv)	Underground Injection Control Permit(s) from the Environmental Protection Agency, California Division of Oil and Gas, and RWQCB.	Table 5.5-5		
Appendix B (g) (14) (B)	A detailed description of the hydrologic setting of the project. The information shall include a narrative discussion and on maps at a scale of 1:24,000 (or appropriate scale approved by staff), describing the chemical and physical characteristics of the following nearby water bodies that may be affected by the proposed project:	Section 5.5.1.1		
Appendix B (g) (14) (B) (i)	Groundwater bodies and related geologic structures;	Section 5.5.1.2		

Adequacy Issue:	Adequate		Inadequate		**DATA ADEQUACY WORKSHEET**		Revision No.	0	Date	
Technical Area:	**Water Resources**				Project:	SES Solar One		Technical Staff:		
Project Manager:					Docket:			Technical Senior:		

SITING REGULATIONS	**INFORMATION**	**AFC SECTION NUMBER**	**ADEQUATE YES OR NO**	**INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS**
Appendix B (g) (14) (B) (ii)	Surface water bodies;	Section 5.5.1.3		
Appendix B (g) (14) (B) (iii)	Water inundation zones, such as the 100-year flood plain and tsunami run-up zones;	Section 5.5.1.8 Figure 5.5-4		
Appendix B (g) (14) (B) (iv)	Flood control facilities (existing and proposed); and	Section 5.5.1.7 Section 5.5.2.4		
Appendix B (g) (14) (B) (v)	Groundwater wells within 0.5 mile if the project will include pumping.	Section 5.5.2.2		
Appendix B (g) (14) (C)	A description of the water to be used and discharged by the project. This information shall include:	Section 5.5.2.2		
Appendix B (g) (14) (C) (i)	Source(s) of the primary and back-up water supplies and the rationale for their selection;	Section 5.5.2.2		
Appendix B (g) (14) (C) (ii)	The expected physical and chemical characteristics of the source and discharge water(s) including identification of both organic and inorganic constituents before and after any project-related treatment. For source waters with seasonal variation, provide seasonal ranges of the expected physical and chemical characteristics. Provide copies of background material used to create this description (e.g., laboratory analysis);	Section 5.5.2.1		
Appendix B (g) (14) (C) (iii)	Average and maximum daily and annual water demand and waste water discharge for both the construction and operation phases of the project;	Table 5.5-2		
Appendix B (g) (14) (C) (iv)	A detailed description of all facilities to be used in water conveyance (from primary source to the power plant site), water treatment, and wastewater discharge. Include a water mass balance diagram;	Section 5.5.2.2		

Adequacy Issue:	Adequate		Inadequate		**DATA ADEQUACY WORKSHEET**		Revision No.	0	Date	
Technical Area:	**Water Resources**				Project:	SES Solar One		Technical Staff:		
Project Manager:					Docket:			Technical Senior:		

SITING REGULATIONS	**INFORMATION**	**AFC SECTION NUMBER**	**ADEQUATE YES OR NO**	**INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS**
Appendix B (g) (14) (C) (v)	For all water supplies intended for industrial uses to be provided from public or private water purveyors, a letter of intent or will-serve letter indicating that the purveyor is willing to serve the project, has adequate supplies available for the life of the project, and any conditions or restrictions under which water will be provided. In the event that a will-serve letter or letter of intent can not be provided, identify the most likely water purveyor and discuss the necessary assurances from the water purveyor to serve the project;	Not Applicable		
Appendix B (g) (14) (C) (vi)	For all water supplied which necessitates transfers and/or exchanges at any point, identify all parties and contracts/agreements involved, the primary source for the transfer and/or exchange water (e.g., surface water, groundwater), and provide the status of all appropriate agencies' approvals for the proposed use, environmental impact analysis on the specific transfers and/or exchanges required to obtain the proposed supplies, a copy of any agency regulations that govern the use of the water, and an explanation of how the project complies with the agency regulation(s);	Not Applicable		
Appendix B (g) (14) (C) (vii)	Provide water mass balance and heat balance diagrams for both average and maximum flows that include all process and/or ancillary water supplies and wastewater streams. Highlight any water conservation measures on the diagram and the amount that they reduce water demand; and	Section 5.5.2.2		

Adequacy Issue:	Adequate		Inadequate		**DATA ADEQUACY WORKSHEET**		Revision No.	0	Date	
Technical Area:	**Water Resources**				Project:	SES Solar One		Technical Staff:		
Project Manager:					Docket:			Technical Senior:		

SITING REGULATIONS	**INFORMATION**	**AFC SECTION NUMBER**	**ADEQUATE YES OR NO**	**INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS**
Appendix B (g) (14) (C) (viii)	For all projects which have a discharge, provide a copy of the will-serve letter, permit or contract with the public or private entity that will be accepting the wastewater and contact storm water from the project. The letter, permit or contract, if possible, shall identify the discharge volumes and the chemical or physical characteristics under which the wastewater and contact storm water will be accepted. In the event that a will-serve letter, permit, or contract cannot be provided, identify the most likely wastewater/storm water entity and discuss why the applicant was unable to secure the necessary assurances to serve the project's wastewater/storm water needs. Also, discuss the term of the wastewater service to the project, whether the wastewater entity has adequate permit capacity for the volume of wastewater from the project and has adequate permit levels for the chemical/physical characteristics of the project's wastewater and storm water for the life of the project, and any issues or conditions/restrictions the wastewater entity may impose on the project.	Section 5.5.2.3		
Appendix B (g) (14) (D)	Identify all project elements associated with storm water drainage, including a description of the following:	See Below		
Appendix B (g) (14) (D) (i)	Monthly and/or seasonal precipitation and storm water runoff and drainage patterns for the proposed site and surrounding area that may be affected by the project’s construction and operation;	Section 5.5.1.4		

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Technical Area:	**Water Resources**				Project:	SES Solar One		Technical Staff:		
Project Manager:					Docket:			Technical Senior:		

SITING REGULATIONS	**INFORMATION**	**AFC SECTION NUMBER**	**ADEQUATE YES OR NO**	**INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS**
Appendix B (g) (14) (D) (ii)	Drainage facilities and the design criteria used for the plant site and ancillary facilities, including but not limited to capacity of designed system, design storm, and estimated runoff;	Section 5.5.2.4 Figure 5.5-4 Figure 5.5-5 Table 5.5-4		
Appendix B (g) (14) (D) (iii)	All assumptions and calculations used to calculate runoff and to estimate changes in flow rates between pre- and post construction; and	Appendix N, Initial Drainage Report		
Appendix B (g) (14) (D) (iv)	A copy of applicable regional and local requirements regulating the drainage systems, and a discussion of how the project's drainage design complies with these requirements.	Section 5.5.5 Table 5.5-5		
Appendix B (g) (14) (E)	An impacts analysis of the proposed project on water resources and a discussion of conformance with water-related LORS and policy. This discussion shall include:	See Below		
Appendix B (g) (14) (E) (i)	The effects of project demand on the water supply and other users of this source, including, but not limited to, water availability for other uses during construction or after the power plant begins operation, consistency of the water use with applicable RWQCB basin plans or other applicable resource management plans, and any changes in the physical or chemical conditions of existing water supplies as a result of water use by the power plant;	Section 5.5.2.2		

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Project Manager:					Docket:			Technical Senior:		

SITING REGULATIONS	**INFORMATION**	**AFC SECTION NUMBER**	**ADEQUATE YES OR NO**	**INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS**
Appendix B (g) (14) (E) (ii)	If the project will pump groundwater, an estimation of aquifer drawdown based on a computer modeling study shall be conducted by a professional geologist and include the estimated drawdown on neighboring wells within 0.5 mile of the proposed well(s), any effects on the migration of groundwater contaminants, and the likelihood of any changes in existing physical or chemical conditions of groundwater resources shall be provided;	A test well will be installed and analysis of water quantity and quality will be included in a supplemental filing.		
Appendix B (g) (14) (iii)	The effects of construction activities and plant operation on water quality and to what extent these effects could be mitigated by best management practices;	Section 5.5.2.2 Section 5.5.4 Section 5.5.5.1		
Appendix B (g) (14) (iv)	If not using a zero liquid discharge project design for cooling and process waters, include the effects of the proposed wastewater disposal method on receiving waters, the feasibility of using pre-treatment techniques to reduce impacts, and beneficial uses of the receiving waters. Include an explanation why the zero liquid discharge process is “environmentally undesirable,” or “economically unsound;”	N./A		
Appendix B (g) (14) (v)	If using fresh water, include a discussion of the cumulative impacts, alternative water supply sources and alternative cooling technologies considered as part of the project design. Include an explanation of why alternative water supplies and alternative cooling are “environmentally undesirable,” or “economically unsound;”	Section 4.5 Section 5.5.2.2 Section 5.18.3.4		

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Project Manager:					Docket:			Technical Senior:		

SITING REGULATIONS	**INFORMATION**	**AFC SECTION NUMBER**	**ADEQUATE YES OR NO**	**INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS**
Appendix B (g) (14) (vi)	The effects of the project on the 100-year flood plain, flooding potential of adjacent lands or water bodies, or other water inundation zones; and	Section 5.5.2.4 Figure 5.5-5		
Appendix B (g) (14) (vii)	All assumptions, evidence, references, and calculations used in the analysis to assess these effects.	Appendix N, Initial Drainage Report		
Appendix B (i) (1) (A)	Tables which identify laws, regulations, ordinances, standards, adopted local, regional, state, and federal land use plans, leases, and permits applicable to the proposed project, and a discussion of the applicability of, and conformance with each. The table or matrix shall explicitly reference pages in the application wherein conformance, with each law or standard during both construction and operation of the facility is discussed; and	Table 5.5-5		
Appendix B (i) (1) (B)	Tables which identify each agency with jurisdiction to issue applicable permits, leases, and approvals or to enforce identified laws, regulations, standards, and adopted local, regional, state and federal land use plans, and agencies which would have permit approval or enforcement authority, but for the exclusive authority of the commission to certify sites and related facilities.	Table 5.5-5 Table 5.5-7		
Appendix B (i) (2)	The name, title, phone number, address (required), and email address (if known), of an official who was contacted within each agency, and also provide the name of the official who will serve as a contact person for Commission staff.	Table 5.5-6		

Adequacy Issue:	Adequate		Inadequate		**DATA ADEQUACY WORKSHEET**		Revision No.	0	Date	
Technical Area:	**Water Resources**				Project:	SES Solar One		Technical Staff:		
Project Manager:					Docket:			Technical Senior:		
SITING REGULATIONS	**INFORMATION**				**AFC SECTION NUMBER**		**ADEQUATE YES OR NO**	**INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS**		
Appendix B (i) (3)	A schedule indicating when permits outside the authority of the commission will be obtained and the steps the applicant has taken or plans to take to obtain such permits.				Table 5.5-7					

Figure 5.5-3 Hydrology Map

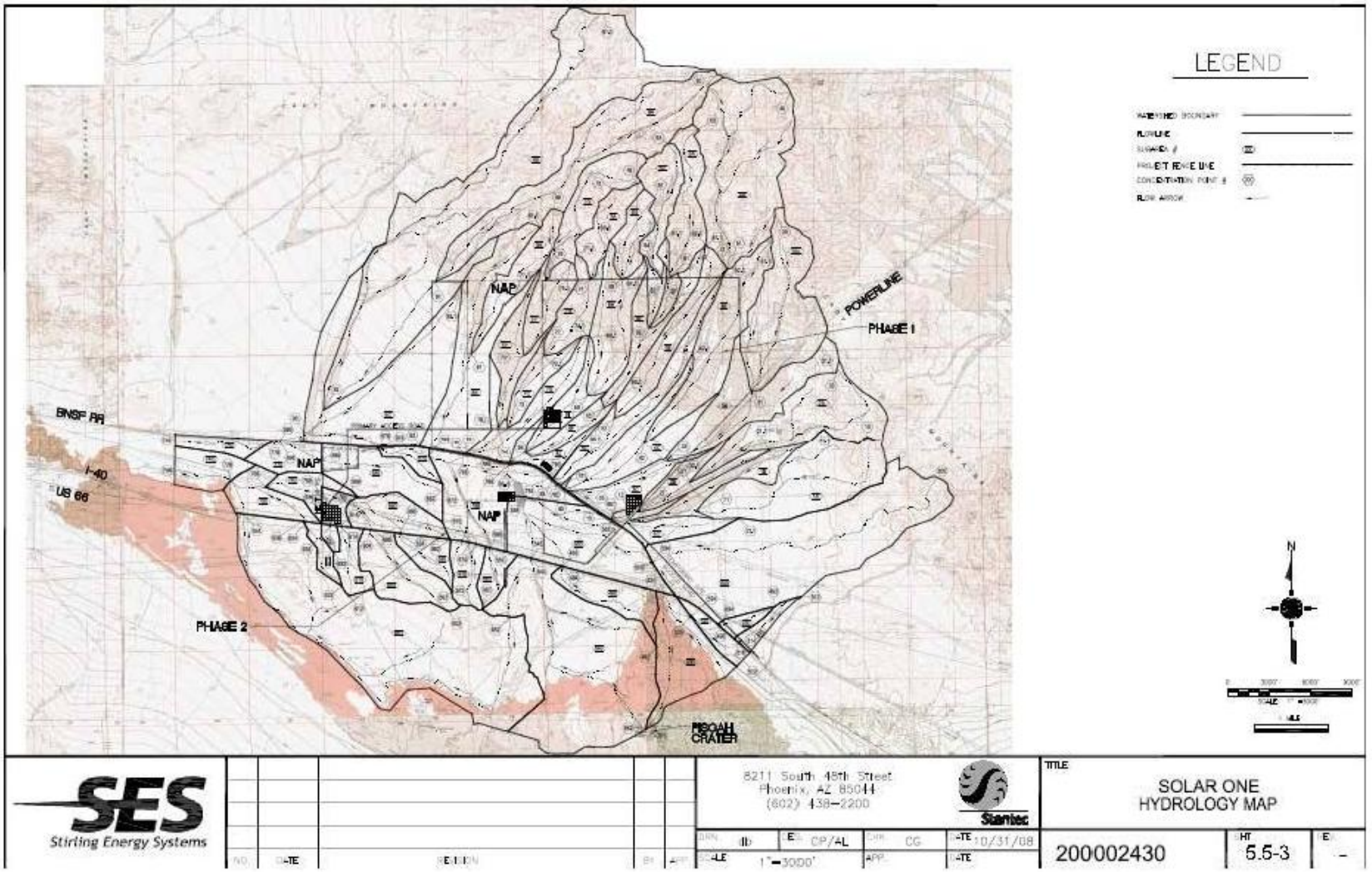
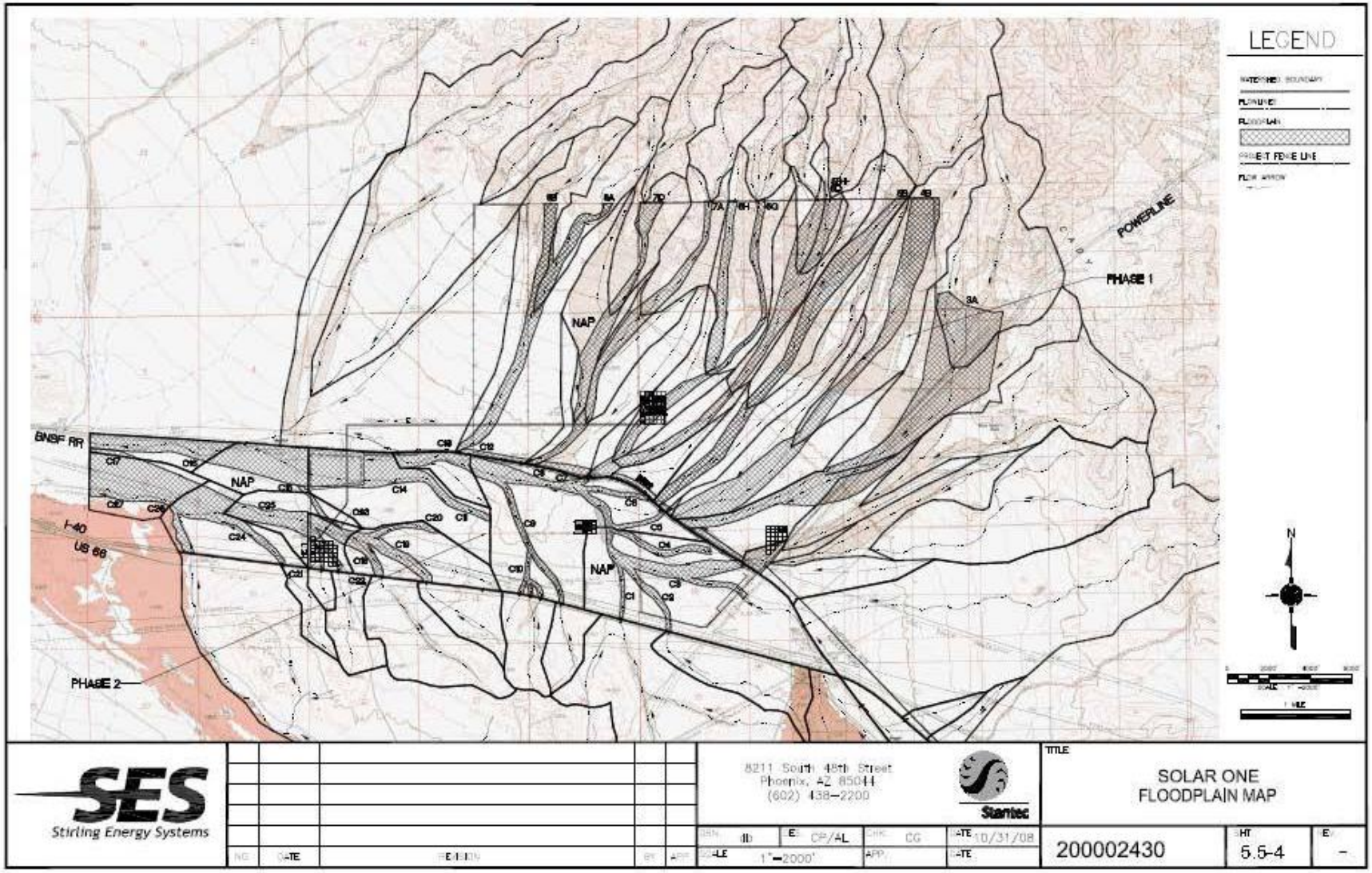
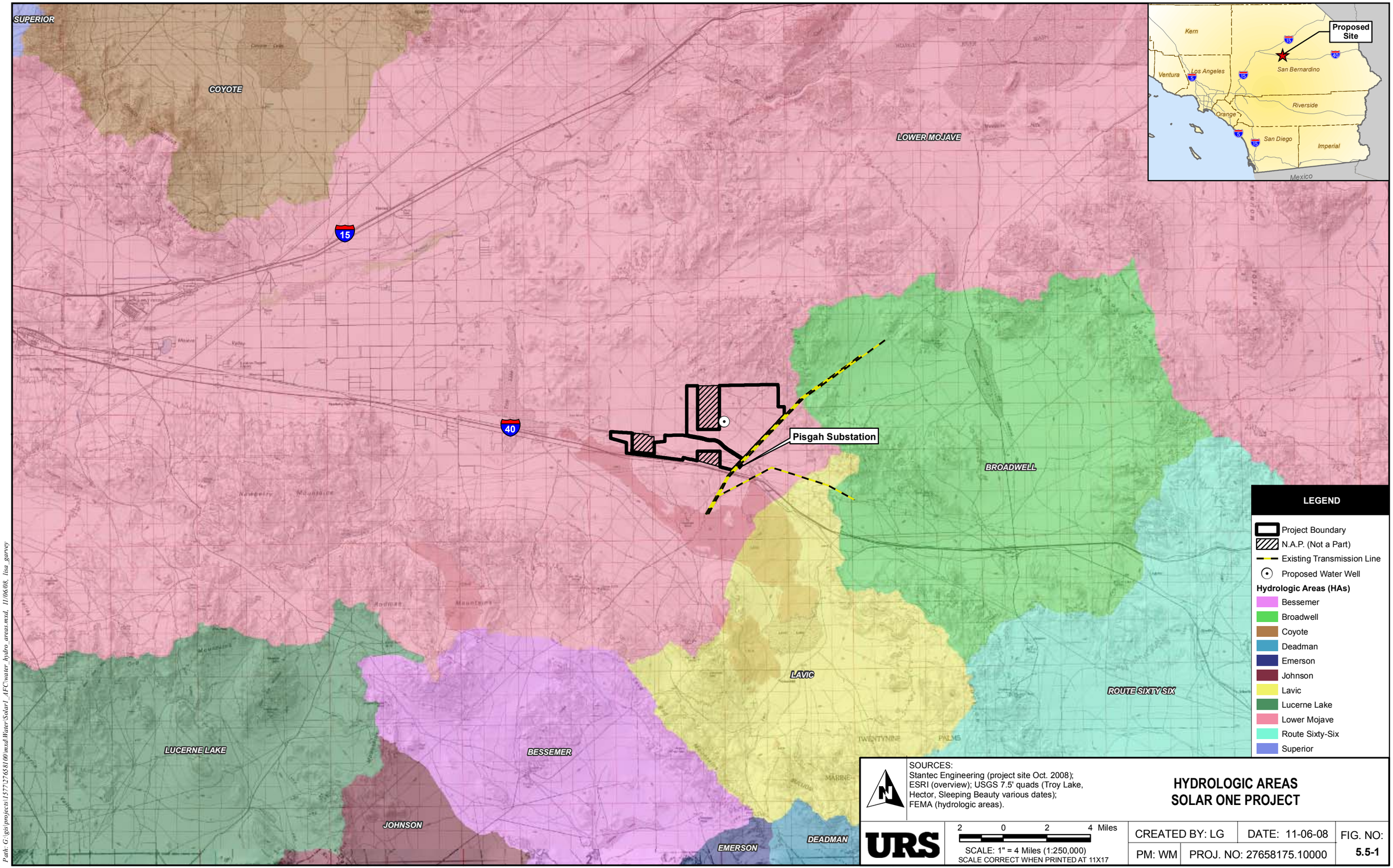


Figure 5.5-4 Flood Plain Map





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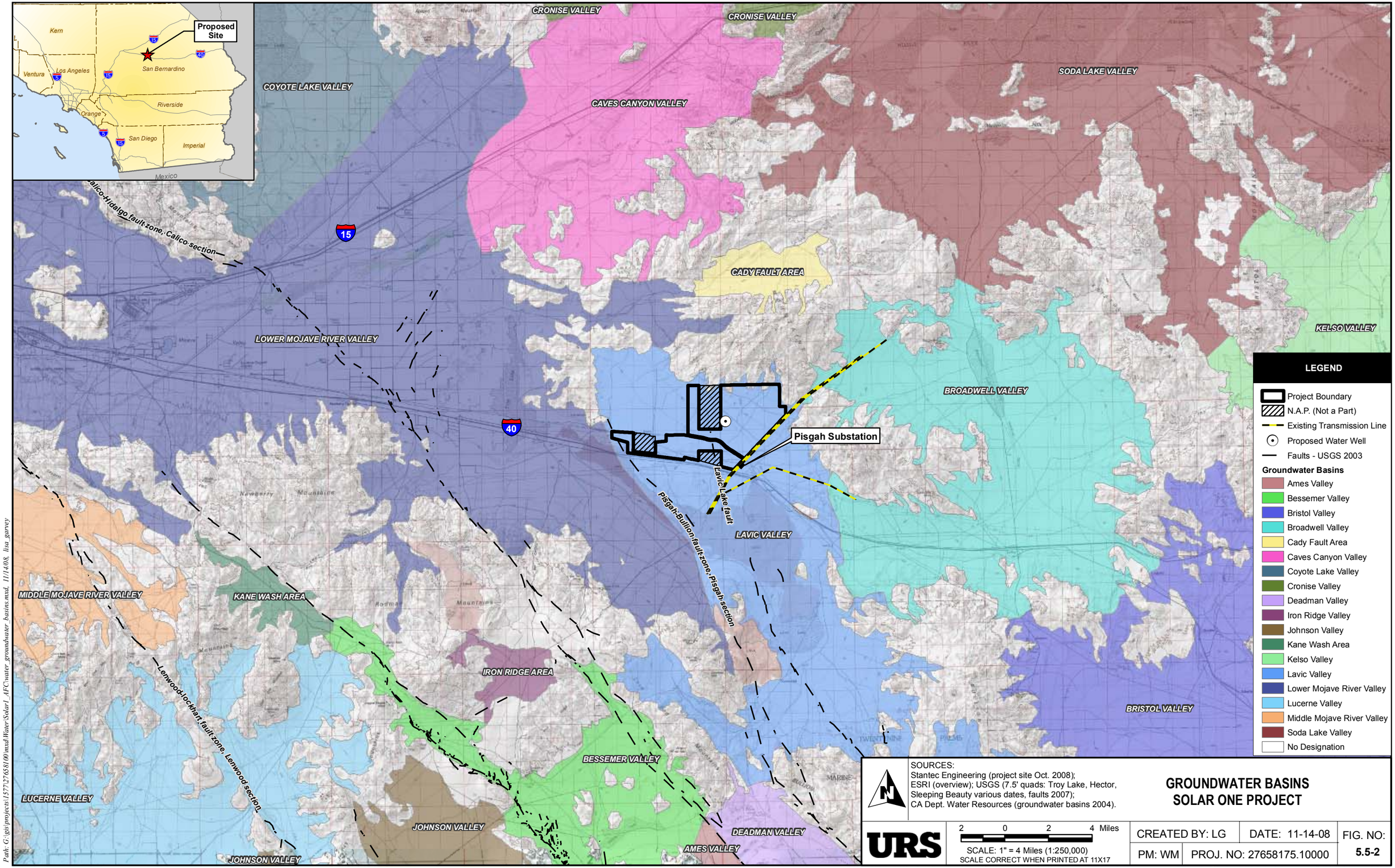

SOURCES:
Stantec Engineering (project site Oct. 2008);
ESRI (overview); USGS (7.5' quads: Troy Lake, Hector, Sleeping Beauty various dates, faults 2007);
CA Dept. Water Resources (groundwater basins 2004).

GROUNDWATER BASINS
SOLAR ONE PROJECT

URS

2 0 2 4 Miles

SCALE: 1" = 4 Miles (1:250,000)
SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: LG	DATE: 11-14-08	FIG. NO:
PM: WM	PROJ. NO: 27658175.10000	5.5-2

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