June 15, 2013

Mr. Christopher Conner
Senior Planner
San Bernardino County Land Use Services Department
Planning Division
385 North Arrowhead Avenue, First Floor
San Bernardino, Calif. 92415

Dear Mr. Conner:

Re: White Road Solar Construction Management Plan and Trip Generation Analysis

RGP Planning & Development Services has prepared this trip generation analysis and construction management plan for the proposed White Road Solar project. The project is located in the community of Phelan, in unincorporated San Bernardino County. This estimate has been prepared using the information provided by the project applicant and by reviewing trip generation analyses for similar projects in California.

SUMMARY PROJECT DESCRIPTION

The White Road Solar project is a 5.8-megawatt solar photovoltaic energy generation facility proposed on one 50-acre parcel. The project would cover about 34 acres. Project facilities would include solar panels, inverters, switchgear, and local distribution powerlines. No permanent administrative or operations and maintenance structures are proposed. During operations, project operations would be automated and unmanned. Occasional visits to the project by maintenance and security personnel would be required to do repairs, clean equipment, and monitor the site.

The major roadway in the project vicinity is Phelan Road, paved roadway located ½ mile to the north. Access to the project would be from White Road, an unimproved roadway providing direct access to Phelan Road. The project vicinity generally consists of vacant land and large-lot single family residences. The site location is depicted in Figure 1 (Vicinity Map).

CONSTRUCTION MANAGEMENT PLAN

Construction Phasing

A 4.5-month construction period is planned. Construction would include two phases: Phase 1, Site Preparation (1.5 months) and Phase 2, PV System Installation (3 months). Phase 1 includes grubbing, limited amounts of grading, and placement of fencing and onsite access roads (aggregate base). Phase 2 includes placement and assembly of solar panels, installation of other electrical components (e.g., conduits and inverters), and the erection of distribution lines.

Construction Routes

Routes to be used by construction vehicles are mapped on Figure 2 (Construction Vehicle Routes). All project construction vehicles would access Phelan Road via White Road. For planning purposes, it is assumed 80 percent of vehicles would travel east on Phelan Road, towards the population and industrial center of Victorville-Hesperia and Interstate 15, which leads to San Bernardino. The remaining 20 percent of vehicles would travel west on Phelan Road towards Highway 138, which provides access to the Palmdale-Lancaster area.

Construction Truck and Other Vehicular Trips

This analysis of construction trips is based on the number of workers, the materials required to construct the facility, and the types of equipment used. Detailed calculations are provided in the attached trip generation table. Construction would occur during daylight hours. Peak travel times for worker vehicles accessing the site will likely coincide with peak morning and evening commute periods (7:00 am to 9:00 am and 4:00 pm to 6:00 pm, respectively), while truck trips would be more distributed during the day.

Large trucks use more roadway capacity than passenger vehicles due to their larger size and reduced maneuverability. To account for their increased demands on roadways, passenger car equivalent (PCE) factors are used. A PCE of 2.5 is applied to all large trucks accessing the site (meaning each truck is counted as equivalent to 2.5 smaller vehicles).

Up to 25 workers would arrive at the project site daily during Phase 1; this increases to 65 workers daily during Phase 2. Some workers would be based in nearby areas such as Pinon Hills and Phelan; however, due to the small residential populations in these communities, many employees would arrive from more distant areas such as Victorville, Hesperia, and San Bernardino. Carpooling is likely to occur, particularly for workers coming from distant locations. A conservative occupancy rate of 2.0 workers per vehicle is assumed.

Other vehicles required during construction include flat bed trucks, freight trucks, gravel end dump trucks, equipment transports, and service trucks. Based on calculations provided by the project construction contractor, large trucks would make an average of 38 roundtrips per day during Phase 1 and 30 roundtrips per day during Phase 2.

Pursuant to the above assumptions, and as detailed in the attached Construction Trip Generation Analysis, it is estimated that a maximum of 68 PCE trips would occur during each of the AM and PM peak hours during Phase 1, and 98 PCE trips would occur during each of the peak hours during Phase 2. This conservatively assumes that a substantial portion of the truck trips occur during peak hours, rather than being more evenly distributed throughout the day.

The impacts of projected construction-period traffic on local roadways are described below. This analysis takes a worst-case scenario where all construction vehicles use the same roadway (i.e., 100 percent of the peak-hour trips occur on each roadway):

- **White Road.** White Road is a local street with negligible traffic. The addition of 98 PCE trips during each of the peak hours for a period of 3 months (the Phase 2 construction period) will have a de minimis impact on roadway operations. Traffic levels would be lower during the initial (Phase 1) construction period.
- **Phelan Road.** Phelan Road is a two-lane undivided roadway, identified as a Major Arterial Highway in the Phelan/Pinon Hills Community Plan Circulation Map. Based on a capacity of 1,600 vehicles per hour per lane (vphpl), the addition of peak-hour construction traffic of 98 vehicles would represent 3 percent of the 3,200 vphpl capacity of Phelan Road. The Phelan/Pinon Hills Community Plan shows Phelan Road between Sheep Creek Road and Baldy Mesa Road serving 13,250 average daily trips (ADTs), equivalent to a volume/capacity ratio of 1.152 and a Level of Service "F." Phelan Road is therefore already heavily impacted. The addition of project traffic would exacerbate this impact for a limited period of time.
- **Highway 138.** Highway 138 is a two-lane undivided highway. Based on a capacity of 1,600 vphpl, this highway has a total capacity of 3,200 vehicles per hour. Caltrans traffic counts for Highway 138 show peak-hour traffic at its intersection with Phelan Road at 960 vehicles. Thus, Highway 138 currently has a peak-hour volume/capacity ratio of 0.300. Volume/capacity ratios below 0.34 equate to Level of Service "A." The addition of 98 vehicles during a single hour would increase the volume/capacity ratio to 0.331, meaning the roadway will continue to operate with free-flowing traffic and a Level of Service "A" during the 3-month Phase 2 construction period. Traffic levels would be lower during the initial (Phase 1) construction period.

OPERATIONAL TRIP GENERATION

Operations and maintenance requirements associated with the project would be minimal. No permanent staff will be based at the project site. Cleaning of solar panels may occur twice annually, and would require a small work crew (fewer than 10 workers) and a small number of light trucks. Additionally, security personnel would visit the site regularly (generally, once every one to two days). Security visits would include one or two security personnel traveling in a single passenger car or light truck. Work crews and security staff are expected to travel to the site from nearby communities.

Heavy equipment will not be required during normal project operations. Solar panels and associated equipment have an operating life of several decades; replacement of large components will be rare. Based on these factors, operational traffic associated with the project would be negligible.

The San Bernardino County Congestion Management Plan (CMP) requires preparation of a Traffic Impact Analysis when operational-period traffic project is anticipated to generate over 250 two-way peak hour trips, or 50 two-way peak hour trips on a segment of CMP arterial highway or State

highway. The project would produce less than 1 trip per day during operations. Therefore, none of the applicable thresholds are exceeded and preparation of a Traffic Impact Analysis is not required.

Please contact me with any questions you may have on this trip generation analysis and construction management plan.

Respectfully submitted,
RGP Planning & Development Services

Rafik Albert, AICP, LEED AP
Associate

Steven Baine, PE

White Road Solar Trip Generation Analysis
Phelan, California

			Construction Vehicles				Vehicle Trip Generation							PCE Trip Generation						
								AM Peak Hour			PM Peak Hour				AM Peak Hour			PM Peak Hour		
		Duration	Quantity	Roundtrips	Type	PCE	ADT	in	out	total	in	out	total	ADT	in	out	total	in	out	total
Phase 1	**Site Preparation**																			
	Workers[1]		13	1	Passenger	1	25	13	0	13	0	13	13	25	13	0	13	0	13	13
	Flat Bed Truck	45 work days (1.5 months)	4	1	Large Truck	2.5	8	4	0	4	0	4	4	20	10	0	10	0	10	10
	Freight Truck		2	1	Large Truck	2.5	4	2	0	2	0	2	2	10	5	0	5	0	5	5
	Gravel End Dump Truck		5	5	Large Truck	2.5	50	5	5	10	5	5	10	125	13	13	25	13	13	25
	Equipment Transport Truck		4	1	Large Truck	2.5	8	4	0	4	0	4	4	20	10	0	10	0	10	10
	Service Truck		1	3	Large Truck	2.5	6	1	1	2	1	1	2	15	3	3	5	3	3	5
	TOTAL						*101*	*29*	*6*	*35*	*6*	*29*	*35*	*215*	*53*	*15*	***68***	*15*	*53*	***68***
Phase 2	**PV System Installation**																			
	Workers[1]		33	1	Passenger	1	65	33	0	33	0	33	33	65	33	0	33	0	33	33
	Ready Mix Truck	60 work days (3 months)	4	1	Large Truck	2.5	8	4	0	4	0	4	4	20	10	0	10	0	10	10
	Freight Truck		15	1	Large Truck	2.5	30	15	0	15	0	15	15	75	38	0	38	0	38	38
	Equipment Transport Truck		5	1	Large Truck	2.5	10	5	0	5	0	5	5	25	13	0	13	0	13	13
	Service Truck		1	6	Large Truck	2.5	12	1	1	2	1	1	2	30	3	3	5	3	3	5
	TOTAL						125	*58*	*1*	*59*	*1*	*58*	*59*	*215*	*96*	*3*	***98***	*3*	*96*	***98***

[1] Assumed occupancy of 2.0 workers per vehicle

PCE = passenger car equivalent. A large truck has a PCE of 2.5; all other vehicles have a PCE of 1.

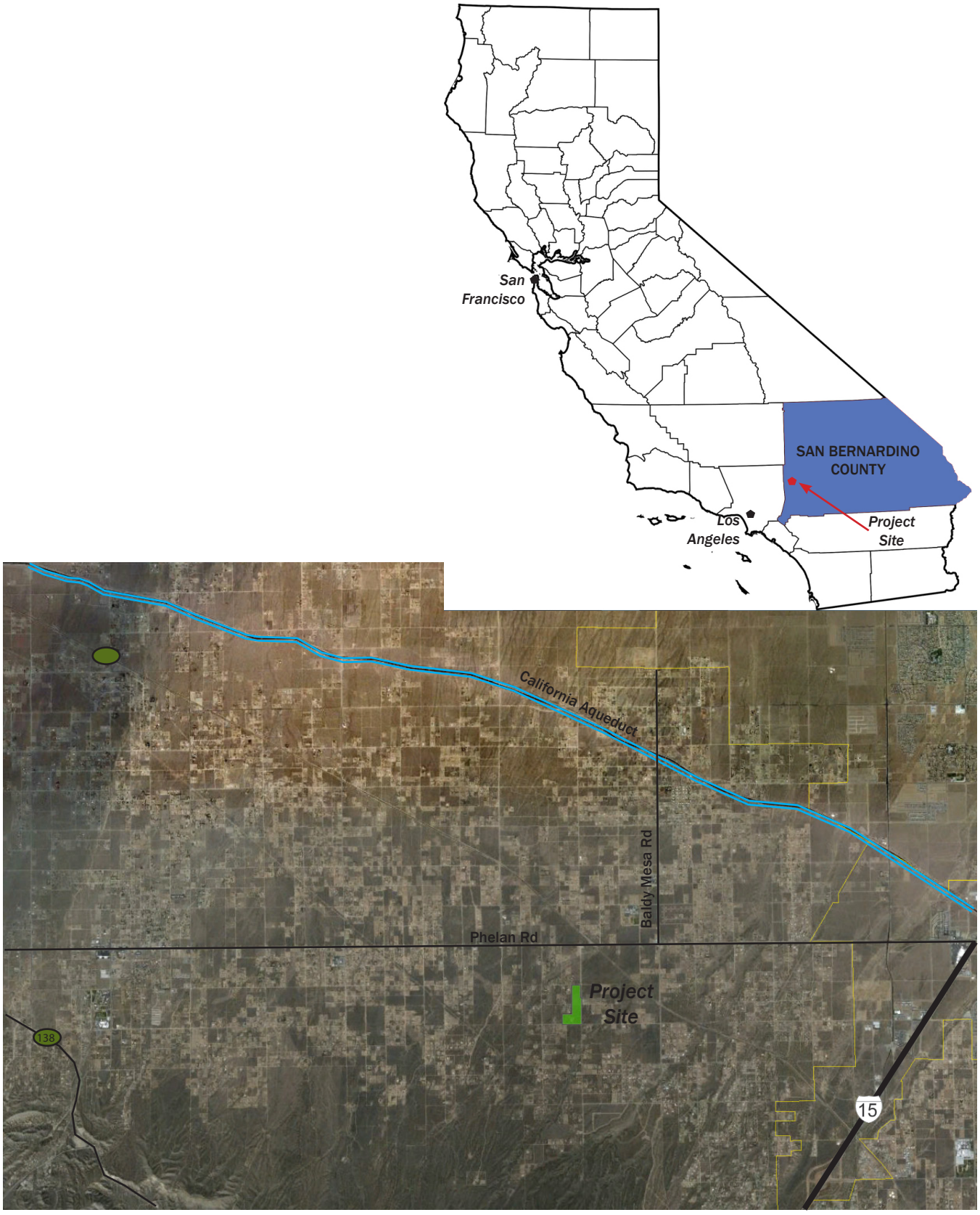

Figure 1
Vicinity Map

White Road Solar
Construction Management Plan & Trip Generation Analysis

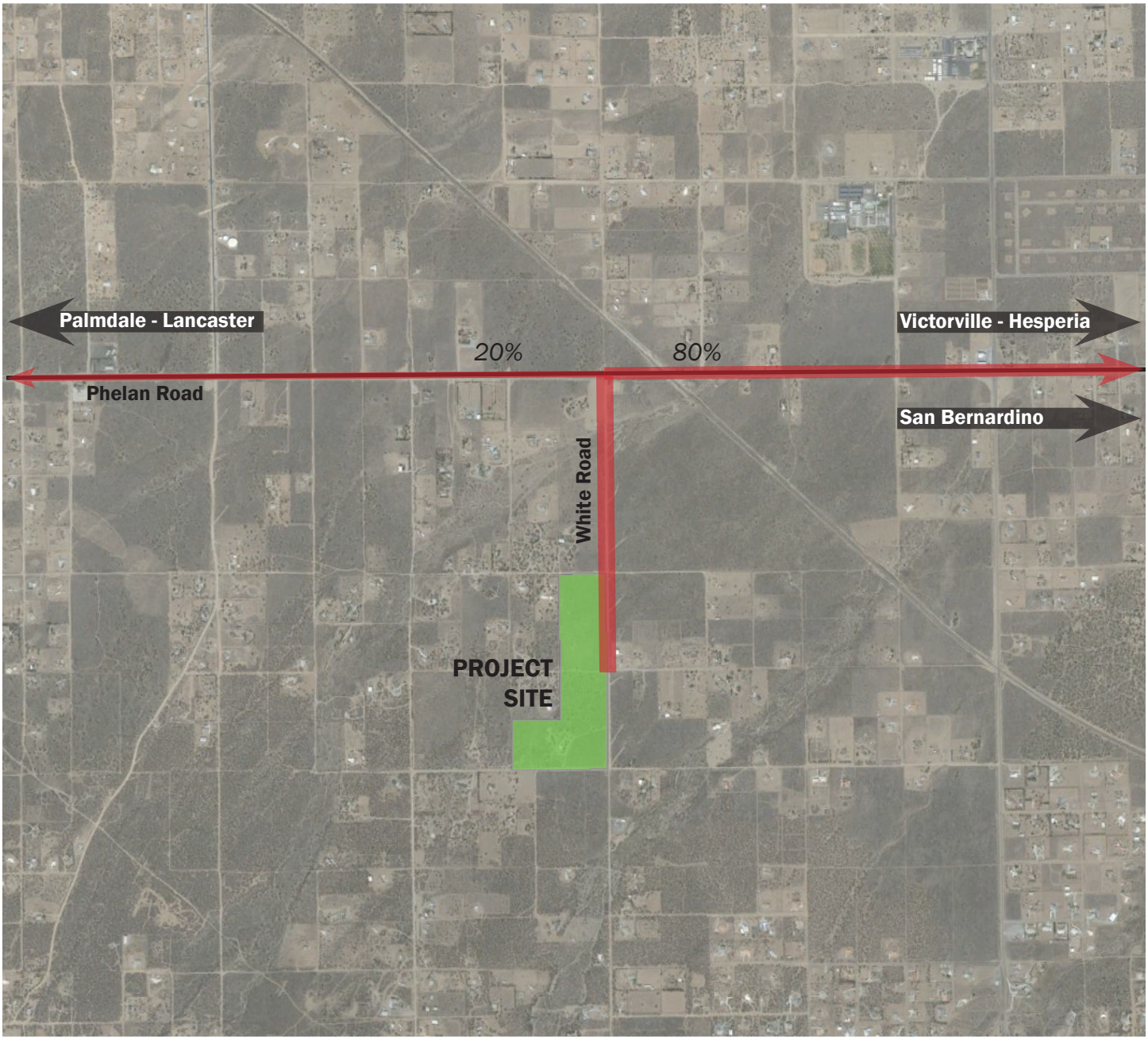

Figure 2

Construction Vehicle Routes