Environment | Planning | Development Solutions, Inc.

January 6, 2014

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: Apple Valley East Solar Construction Management Plan & Trip Generation Analysis

EPD Solutions has prepared this trip generation analysis and construction management plan for the proposed Apple Valley East Solar project. The project is located in the Victor Valley area of unincorporated San Bernardino County, immediately to the east of the town of Apple Valley. This estimate is based on project construction information provided by the project applicant and trip generation analyses for similar projects in California.

SUMMARY PROJECT DESCRIPTION

The Apple Valley East Solar project is a 3-megawatt solar photovoltaic energy generation facility proposed on 2 parcels covering 23 acres. Project facilities would primarily consist of solar panels, inverters, and switchgear. No permanent administrative or operations and maintenance structures are proposed. During project operations, the facility would be automated and unmanned. Occasional visits to the project by maintenance and security personnel would be required to complete repairs, clean equipment, and monitor the site.

Major roadways in the project vicinity include Central Road, along the site's western boundary, and Bear Valley Road, 2 miles north of the project site. Access to the project would be from Central Road. The project vicinity generally consists of rural residential development mixed with vacant parcels. A railroad line is present along the site's southern boundary. The site location is depicted in Figure 1 (Vicinity Map).

CONSTRUCTION MANAGEMENT PLAN

Construction Phasing

A 4-month construction period is planned. Construction would occur in two phases: Phase 1, Site Preparation (1.5 months) and Phase 2, PV System Installation (2.5 months). Phase 1 includes grubbing, limited amounts of grading, and placement of fencing and onsite access roads (aggregate base or similar). Phase 2 includes placement and assembly of solar panels, installation of other electrical components (e.g., conduits and inverters), and interconnection with powerlines adjacent to the site.

Construction Routes

Routes to be used by construction vehicles, including the personal vehicles of construction personnel and construction equipment (e.g., dump trucks) are mapped on Figure 2 (Construction Vehicle Routes). All project construction vehicles would travel north on Central Road to Bear Valley Road. At Bear Valley Road, traffic directed to Hesperia and southbound Interstate 15 would travel west; traffic directed to Victorville and northbound Interstate 15 would continue north on Central Road. A small fraction of traffic would travel east on Bear Valley Road, which connects to Highway 18; Highway 18 provides access to parts of Victorville and to Lucerne Valley. For planning purposes, it is assumed that at the Central Road/Bear Valley Road intersection, 50 percent of vehicles will travel west on Bear Valley Road, 40 percent north on Central Road, and 10 percent east on Bear Valley Road.

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 20 workers would arrive at the project site daily during Phase 1; this increases to 50 workers daily during Phase 2. Most workers would be based in Victor Valley communities including Apple Valley, Victorville, and Hesperia. Carpooling is likely to occur, particularly for workers traveling longer distances. 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 30 roundtrips per day during Phase 1 and 20 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 60 PCE trips would occur during each of the AM and PM peak hours during Phase 1, and 73 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):

- **Central Road.** Central Road is a paved, two-lane roadway serving scattered residential developments to the east of Apple Valley. The addition of 73 PCE trips during each of the peak hours for a period of up to 2.5 months (Phase 2) will have a de minimis impact on roadway operations. Traffic levels would be lower during the earlier (Phase 1) construction period.
- **Bear Valley Road.** Bear Valley Road is a paved roadway varying from two to four lanes in width. This roadway connects Highway 18 in the east with Interstate 15 in the west. The addition of 73 PCE trips during each of the peak hours for a period of up to 2.5 months (Phase 2) will have a de minimis impact on roadway operations. Traffic levels would be lower during the earlier (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.

Other than a water truck that may be required during panel cleaning twice annually, neither large trucks nor 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,
EPD Solutions

Rafik Albert, AICP, LEED AP
Senior Associate

Steven Baine, PE

Apple Valley East Solar Construction Trip Generation Analysis

			Construction Vehicles				Vehicle Trip Generation							PCE Trip Generation						
							ADT	AM Peak Hour			PM Peak Hour			ADT	AM Peak Hour			PM Peak Hour		
		Duration	Quantity	Roundtrips	Type	PCE		in	out	total	in	out	total		in	out	total	in	out	total
Phase 1	**Site Preparation**																			
	Workers[1]		10	1	Passenger	1	20	10	0	10	0	10	10	20	10	0	10	0	10	10
	Flat Bed Truck		4	1	Large Truck	2.5	8	4	0	4	0	4	4	20	10	0	10	0	10	10
	Freight Truck	30 work days	3	1	Large Truck	2.5	6	3	0	3	0	3	3	15	8	0	8	0	8	8
	Gravel End Dump Truck		3	5	Large Truck	2.5	30	3	3	6	3	3	6	75	8	8	15	8	8	15
	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	3	Large Truck	2.5	6	1	1	2	1	1	2	15	3	3	5	3	3	5
	TOTAL						*80*	*26*	*4*	*30*	*4*	*26*	*30*	*170*	*50*	*10*	***60***	*10*	*50*	***60***
Phase 2	**PV System Installation**																			
	Workers[1]		25	1	Passenger	1	50	25	0	25	0	25	25	50	25	0	25	0	25	25
	Ready Mix Truck	50 work days	3	1	Large Truck	2.5	6	3	0	3	0	3	3	15	8	0	8	0	8	8
	Freight Truck		10	1	Large Truck	2.5	20	10	0	10	0	10	10	50	25	0	25	0	25	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						90	*43*	*1*	*44*	*1*	*43*	*44*	*150*	*70*	*3*	***73***	*3*	*70*	***73***

[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.

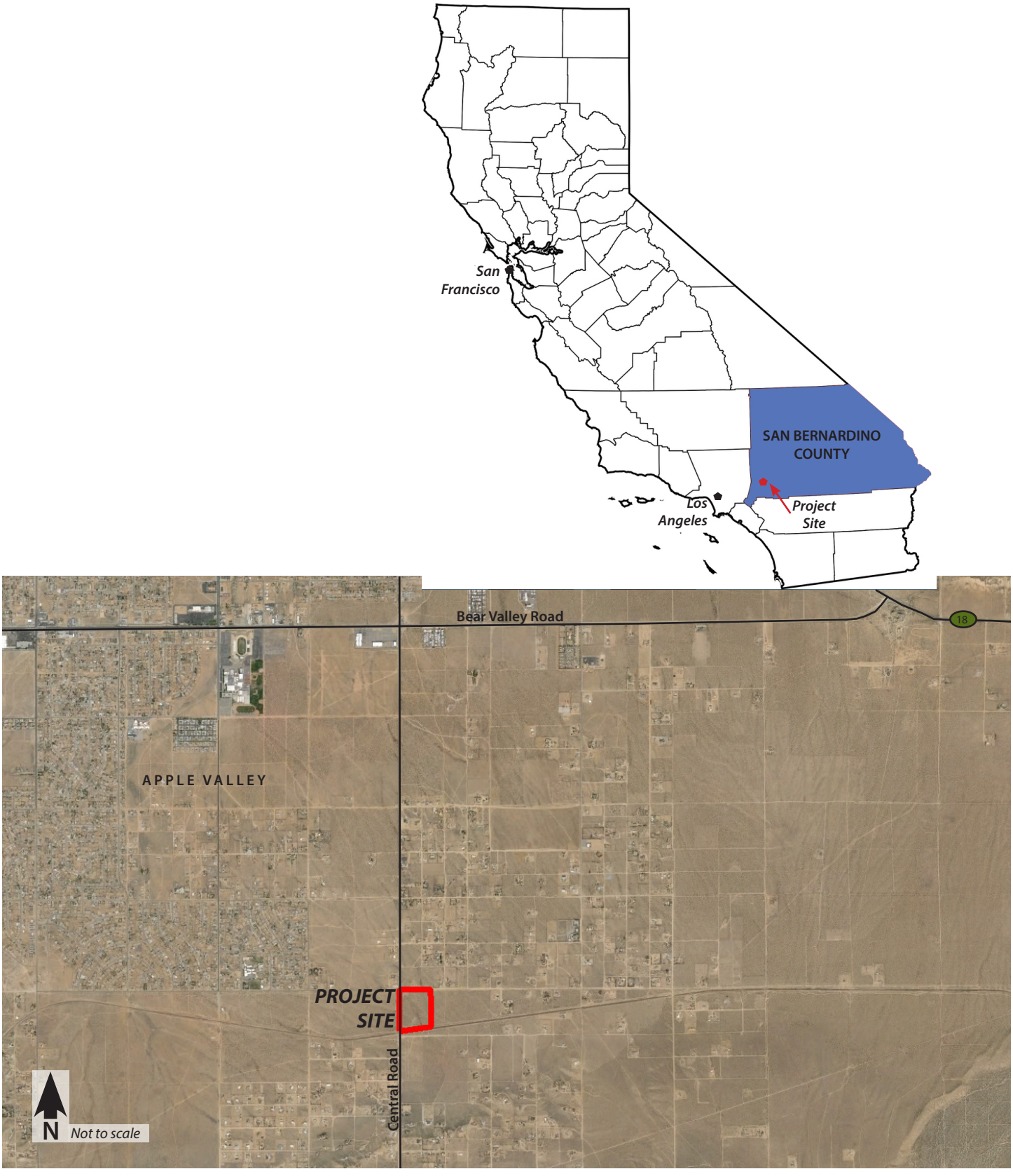

Figure 1
Vicinity Map

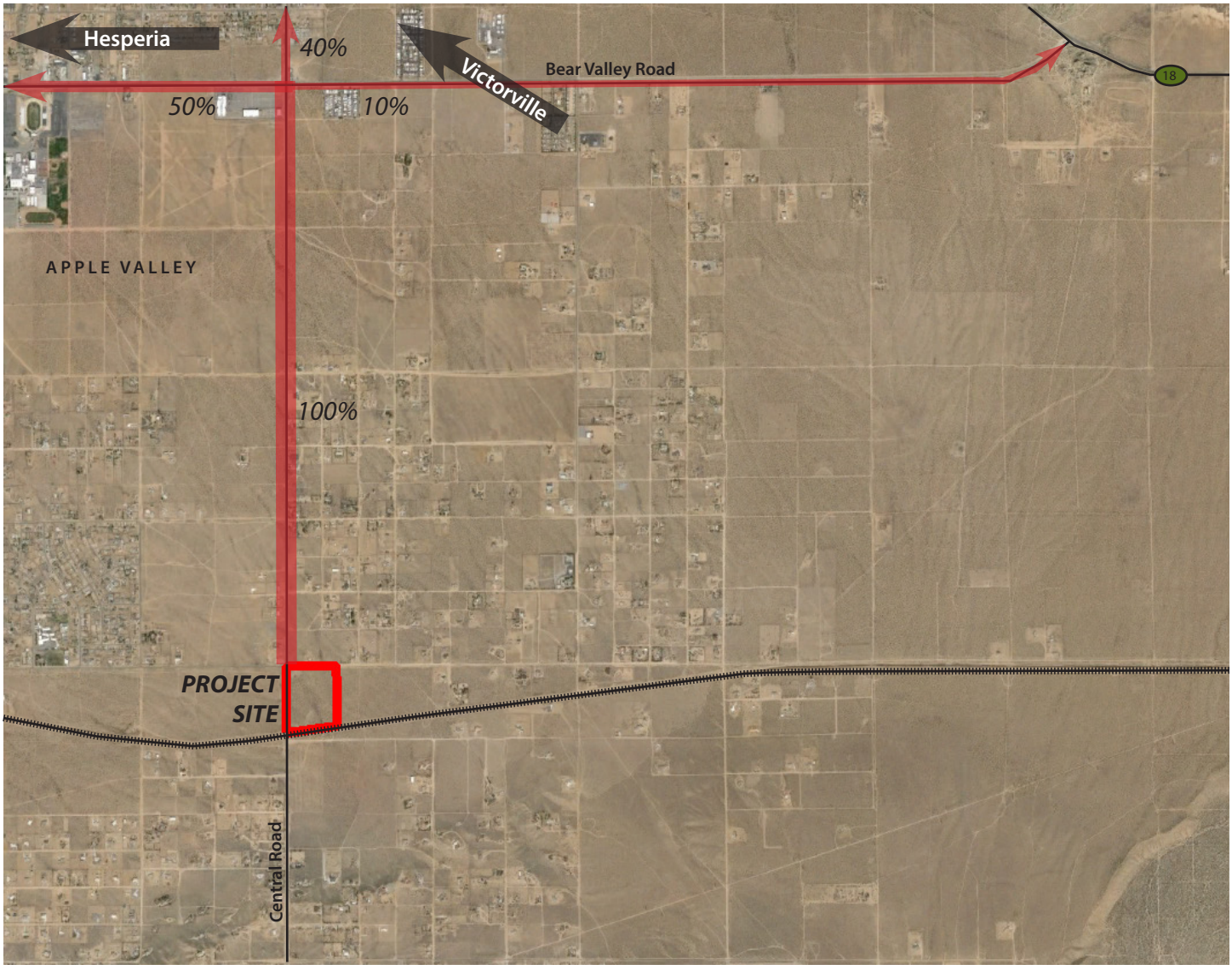

Figure 2
Construction Vehicle Routes