



# Transportation Technical Report

*Dogwood Geothermal Energy Project*

*Heber 2 Solar Energy Project*

*Heber Field Company Geothermal Wells & Pipeline Project*

Prepared for: Imperial County Planning & Development Services  
Submitted by: Catalyst Environmental Solutions

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## SECTION 1 Introduction

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Catalyst Environmental Solutions Corporation (Catalyst) has prepared this report to evaluate the potential for impacts related to transportation and circulation resulting from implementation of the proposed Dogwood Geothermal Energy Project, Heber 2 Parasitic Solar Project, and the Heber Field Company Geothermal Wells and Pipeline Project (collectively, the Project) in the Imperial County, California. This report includes an evaluation of potential impacts associated with temporary and permanent increases in traffic in the vicinity of the Project site and whether Project-induced traffic is in excess of standards established by the applicable local jurisdiction (i.e., Imperial County). Information given in this report is based on transportation and circulation information obtained from available public resources including the Imperial County General Plan Circulation and Scenic Highways Element (Imperial County 2008) and California Department of Transportation (Caltrans) Traffic Census Program (Caltrans 2022). Imperial County Department of Public Works provides a set of criteria within its published *Traffic Study and Report Policy* (2007). Those guidelines are incorporated herein.

### 1.1 Project Overview

#### 1.1.1 Project Location and Description

The Dogwood Project entails the development of a 25 MW (net generation) geothermal power plant that will include one ORMAT Energy Converter (OEC), cooling towers, two isopentane tanks, a supplemental solar field, up to three production wells, a project substation, and ancillary facilities. The Project site includes the existing Heber 2, Heber South, and Goulds 2 geothermal power stations, on Assessor's Parcel No. (APN) 054-250-31-01, a 39.99-acre parcel that is approximately  $\frac{3}{4}$  mile southwest of the town of Heber. The Dogwood geothermal facilities would be supplemented by an auxiliary solar field. The location for the supplemental solar photovoltaic field is still under consideration but will likely be near the Dogwood Project site. The solar photovoltaic field will provide behind-the-meter power used to offset the auxiliary load of the facility. Proposed facilities include:

- **Dogwood Project (OrHeber 3, LLC) – New CUP**
  - One (1) Integrated Two Level Unit (ITLU) Air Cooled ORMAT Energy Converter (OEC) generating unit
  - Two (2) 20,000-Gallon Isopentane Tanks for Motive Fluid Storage
  - One (1) Project substation for transmission to the grid
  - Ancillary and auxiliary facilities (including, compressed air system and fire prevention system)
  - A seven (7) megawatt (MW) solar photovoltaic field dedicated to the Dogwood geothermal plant
  - Interconnecting cable line from Dogwood solar facilities to Dogwood geothermal plant

- **Heber 2 Parasitic Solar Energy Facilities (Second Imperial Geothermal Company) – Amendment to CUP No. 19-0017**
  - A fifteen (15) MW solar photovoltaic field dedicated to the Heber 2 geothermal plant
  - Interconnecting cable line from Heber 2 solar facilities to Heber 2 geothermal plant
- **Wells and Pipeline (Heber Field Company, LLC) – Amendment to CUP No. 06-0028**
  - Up to six (6) new production wells (3 sited, 3 unsited)
  - One (1) new injection well
  - Brine pipelines

The Dogwood Project would rely on fluid from the existing wellfield and up to three (3) new production wells proposed by the Heber Field Company (HFC) which owns and operates the wells that service the Heber 2, Heber South, and Goulds 2 facilities. HFC also proposes to utilize the existing available injection capacity from an existing well on-site and one (1) new injection well that would be installed on-site adjacent to the Dogwood Project. The location of the new production and injection wells has not been finalized, but would be within 1-mile from the Dogwood Project site. HFC would install new on-site connections and pipelines segments to connect the Dogwood Project with the new and existing well system. The total project area of disturbance from the proposed development is approximately 124 acres as summarized in **Table 1**.

Table 1. Dogwood Project Area of Disturbance Estimates

Facility	Disturbance (Acres)
Geothermal Energy Facilities and Project Substation	5.0 acres
Solar Field and Connection Line	~95 acres
Production and Injection Wells and Connecting Pipeline	~24 acres
<b>TOTAL</b>	<b>124 acres</b>

### 1.1.2 Geothermal Production and Injection Wells

HFC will complete geothermal production wells in compliance with California Geologic Energy Management Division (CalGEM) Regulations (California Code of Regulations, Chapter 4, Subchapter 4) to depths between 1,000 and 4,000 feet, averaging approximately 3,500 feet. These wells are in the locating/siting process but are likely to be located within 1-mile of the proposed Dogwood Project. Casing depth will vary depending on the total depth of the well. After the well is completed, a well head will be installed and connected to a new transmission pipeline that will convey geothermal fluid to the Dogwood Project (as discussed below). An insulated electric conductor running from the OEC to the wellheads along the connecting pipelines will supply electricity to the wellhead pump motors. During normal well operations, total geothermal fluid production rates are expected to be approximately 8,000 gallons per minute (gpm) at 280°F.

One new injection well would be installed directly adjacent to the Dogwood plant. This well would also be owned and operated by HFC. This well is designed to provide direct service to the Dogwood Project, in addition to the available capacity in the existing HFC injection well/system. Injection will occur at the same approximate levels (i.e., 8,000 gpm) but at lower temperatures of approximately 170°F. Individual

production well flow rates are expected to be approximately 4,000 gpm, with a wellhead pressure of about 100 pounds per square inch.

### 1.1.3 Geothermal Fluid Pipeline

Geothermal fluid and brine pipelines proposed by HFC will be used to transport geothermal fluid from the production wells to the Dogwood Project, the cooling unit, and the injection wells. Construction of the pipeline network will include auguring 24-inch diameter holes into the ground about three to five feet deep at approximately 30-foot intervals along the pipeline route. When complete, the top of the new geothermal pipelines will average three feet above the ground surface. Electrical power and instrumentation cables for the wells may also be installed in steel conduit constructed along the pipe.

### 1.1.4 ORMAT Energy Converter (OEC)

The proposed OEC unit is a two-turbine combined cycle binary unit, operating on a subcritical Rankine cycle, with isopentane as the motive fluid. The OEC system consists of a generator, turbines, a vaporizer, Air-Cooled condensers, preheaters and recuperators, and an evacuation skid/vapor recovery maintenance unit (VRMU) for purging and maintenance events. The design capacity for the unit is 25 MW (net).

### 1.1.5 Isopentane Storage Tanks

Two double-walled 20,000-gallon above-ground storage tanks (AST) will be installed for the Project. Numerous safety and fire prevention measures will be installed on/near the isopentane tanks, including:

- Concrete foundations with blast walls separating the tank from the OEC
- An automated water suppression system.
- Concrete containment areas.
- Two flame detectors, which will immediately detect any fire and immediately trigger the automatic fire suppression system.
- A gas detector, which will immediately detect any isopentane leak and notify the control room (manned by 24/7).

### 1.1.6 Cooling Tower

A cooling tower array will perform air-cooling operations of the geothermal fluid. The cooling tower will include a series of heat-absorbing evaporators and condensers to capture and transfer heat stored in the geothermal fluid.

### 1.1.7 Supplemental Solar Energy Plant

An approximately 7 MW (net) solar photovoltaic field would provide power directly to the Dogwood Project to offset auxiliary/parasitic loads during operations. The solar arrays will effectively reduce the margin between gross and net geothermal energy generation, allowing for the more efficient generation of geothermal energy.

The solar facility will not connect to the substation or generate power that will enter the transmission grid; rather, the solar facility will be entirely behind-the-meter and would serve as an integrated part of the operation of the geothermal power plant.

### 1.1.8 Project Substation

The Project will require a new substation to step up the low voltage electrical energy generated at the Dogwood Project to the higher voltage required for transmission. No upgrades to the off-site transmission will occur, and the Dogwood substation will connect directly to the existing point of interconnection with the Imperial Irrigation District controlled grid. The substation will include a 13.8 kV circuit breaker to protect the electric generator, a minimum of 80 megavolt ampere 13.8 kV/115 kV transformer, and 115 kV potential and current transformers for metering and system protection.

### 1.1.9 Water Use and Source

Water required for well drilling would typically average 50,000 gpd. Water necessary for road grading, construction, and dust control would average approximately 4,000 gpd. Water necessary for these activities would be obtained from local irrigation canals in conformance with Imperial Irrigation District (IID) requirements. Alternatively, a temporary pipeline from the respective irrigation canal could be used for water delivery to well site. Any temporary pipeline would be laid on the surface immediately adjacent to the access road. The Project will not require additional water from the IID for operations and will be covered under the existing contract.

## 1.2 Construction Activities

The Project is anticipated to take 16 to 24 months to install, test, and become fully operational as summarized in **Table 2**.

Table 2. Project Construction Process/Phasing

Construction Phase	Tentative Schedule	Total Duration
Site Preparation (Plant and Solar Fields)	2 Months	35 Months
Project Construction	16 Months	
Well Drilling and Pipe Interconnection	12 Months	
Substation Development and Interconnection	4 Months	
Testing	1 Month	

The estimated construction schedule and vehicle and truck trip counts associated with construction activities is detailed **Table 3**.

Table 3. Construction Vehicle Trips

Construction Phase	Trip Type	Number of One-Way Trips per Day <sup>1</sup>	One-Way Trip Length (miles) <sup>2</sup>
Site Preparation	Workers	46	10.2
	Vendor	10	11.9
	Haul	8	20
Project Construction	Workers	46	10.2

	Vendor	40	225
	Haul	2	20
<b>Well Drilling and Pipe Interconnection</b>	Workers	46	10.2
	Vendor	10	11.9
	Haul	0	20
<b>Substation Development and Interconnection</b>	Workers	46	10.2
	Vendor	10	11.9
	Haul <sup>3</sup>	0	20
<b>Testing</b>	Workers	46	10.2
	Vendor	4	11.9
	Haul	0	20

Notes:

1. Trip generation rate is calculated at roughly 3 trips/worker (assumed 50 percent of 15 workers leave/return once during the day) for an estimate of 46 total worker trips, and 2 trips/vehicle (in/out) for vendor and haul trips.
2. Trip lengths consist of default CalEEMod values with exception of vendors for delivery of Project equipment during construction, with deliveries of solar panels, geothermal equipment, etc. assumed to originate at Port of Long Beach, approximately 225 miles from Project site.
3. All truck trips are assigned to vendor deliveries.

### 1.3 Operation Activities

Once the proposed Project is complete, the site will be staffed with 1-2 onsite employees. The proposed Project would require routine maintenance and unscheduled maintenance as needed. The parasitic solar facilities will be monitored remotely with visitation on an as-needed basis, and security personnel will perform periodic site visits. Any required planned maintenance activities would generally consist of equipment inspection and replacement and would be scheduled to avoid peak load periods. Any unplanned maintenance would be responded to as needed, depending on the event.



## SECTION 2 Regulatory Framework

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The following summarizes the regulatory framework as applicable to the proposed Project with respect to transportation and circulation.

### 2.1 California Department of Transportation

The State of California Department of Transportation (Caltrans) has responsibility over the design, construction, maintenance, and operation of the California State Highway System. Caltrans has jurisdiction over State highway right-of-way and sets maximum load limits for trucks and safety requirements for oversized vehicles that operate on highways. The proposed Project does not include any components which would encroach into Caltrans jurisdiction.

### 2.2 Southern California Association of Governments

The Southern California Association of Governments (SCAG) is a joint powers authority that was established in 1965. Federally, SCAG is a Metropolitan Planning Organization; under State law it is a Regional Transportation Planning Agency and a Council of Governments. SCAG includes Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura counties. SCAG's responsibilities include developing long-range regional transportation plans, including the consideration of sustainable growth, growth forecasting, housing needs, and transportation improvement (SCAG 2014).

### 2.3 Imperial County General Plan

The Circulation and Scenic Highways Element of the Imperial County General Plan provides information about the transportation needs of Imperial County and provides guidance to meet these needs and to facilitate regional transportation coordination. Objectives noted in the Circulation and Scenic Highways Element include:

- Objective 1.2: Require a traffic analysis for any new development which may have a significant impact on County roads. A traffic analysis may not be necessary in every situation, such as when the size or location of the project will not have a significant impact upon and generate only a small amount of traffic. Also, certain types of projects, due to the trip generation characteristics, may add virtually no traffic during peak periods. These types of projects may be exempt from the traffic analysis requirements. Whether a particular project qualifies for any exemption will be determined by the Department of Public Works Road Commissioner.
- Objective 1.12: Review new development proposals to ensure that the proposed development provides adequate parking and would not increase traffic on existing roadways and intersection to a level of service (LOS) worse than "C" without providing appropriate mitigations to existing infrastructure. This can include fair share contributions on the part of developers to mitigate traffic impacts caused by such proposed developments.

## 2.4 Imperial County Traffic Study Criteria

The Imperial County Department of Public Works provides a set of criteria within its published Traffic Study and Report Policy (2007) to identify the need for a traffic study and report to be prepared. The basic criteria used to make the determination for providing a complete traffic study are:

- a. Any project that adds more than 8% of the total existing vehicle trips on the adjacent road system at full build-out of the project.
- b. Any project that generates more than 400 daily residential trips, 800 commercial or industrial trip ends, or 200 peak hour trip ends, as determined by the average trip rates contained in the ITE Trip Generation Informational Report or the Imperial County local exceptions.
- c. Any project that has the potential to degrade an existing road section, an existing signalized intersection, or an existing unsignalized intersection to below the existing level of service or cause it to be lower than a level of service "C" during any peak hour, using the Highway Capacity Manual (HCM) methods of analysis on any individual, existing traffic movement.
- d. Any project, within section b above, which generates more than 10% of its total traffic in the form of truck traffic.
- e. Any project that intensifies the usage of the site above the level currently allowed by zoning codes and requires a CUP, zone change, variance, or other discretionary permit.

Any project that may cause an existing or proposed intersection to meet traffic signal warrants or cause a proposed intersection to be lower than LOS "C".

## SECTION 3 Existing Conditions

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### 3.1 Existing Roadway Network

Key roadways in the study area are described here. The discussion is limited to specific roadways that traverse the study intersections and serve the Project site.

#### 3.1.1 Roads

As described in the Imperial County Circulation and Scenic Highways Element (Imperial County 2008) and the Imperial County Long Range Transportation Plan (Imperial County Transportation Commission [ICTC] 2013), the regional roadway network consists of one interstate route (I-8), seven State routes (SR-7, SR-78, SR-86, SR-98, SR-111, SR-115, and SR-186), and several regionally significant arterials. Additionally, three international Ports of Entry (POEs) between the United States and Mexico are within the Imperial County limits: Calexico, Calexico East, and Andrade (ICTC 2013). **Figure 1** shows the major roadways in Imperial County.

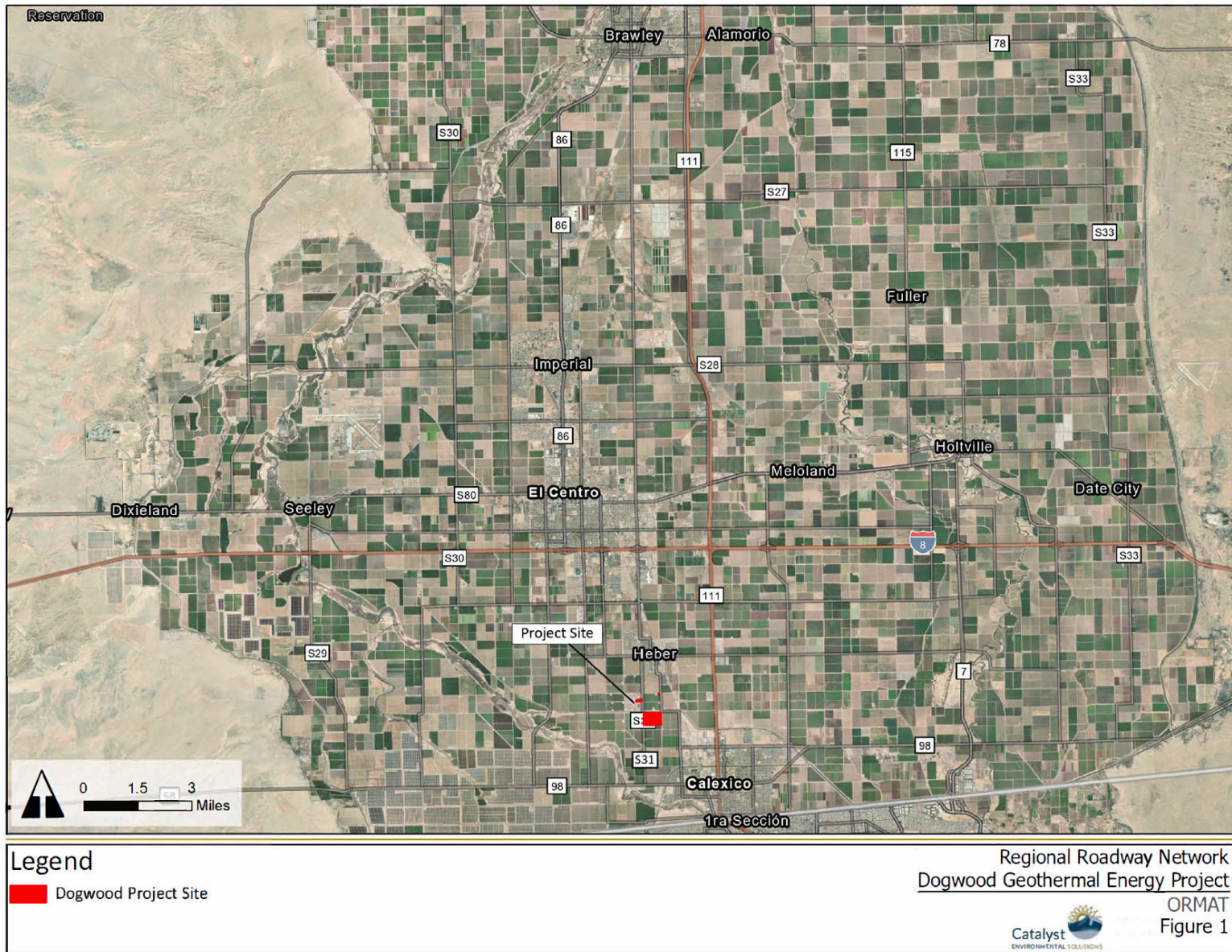


Figure 1. Regional Network in Project Area

### 3.1.2 Freeways

Freeways are controlled-access, high-speed roadways with grade-separated interchanges. They are intended to carry high volumes of traffic from region to region. The following freeways provide regional access to the Project area:

- **Interstate 8 (I-8)** is the primary east-west route through Imperial County and runs for 172 miles from San Diego, California, to Yuma, Arizona. With two travel lanes, it spans 79 miles within Imperial County. From the west it connects to the western end of SR-98. In Imperial County, it intersects with SR-86, SR-111 (access to the international POE at Calexico), SR-7, and SR-115 and then reconnects to SR-98 at its eastern end. It also accesses the SR-186 connection to the Andrade POE. It serves regional, cross-border, and interstate traffic and provides access to desert recreational areas.

### 3.1.3 Major Highways

Major arterial roadways typically consist of four to six travel lanes with two to three lanes travel in each direction separated by either a raised or painted median. These roadways are designed to carry high volumes of traffic and typically provide the necessary links to the regional freeway system. These roadways also serve the major developments in the County that generate higher traffic volumes. Major roadways in the Project area providing access include:

- **State Highway 98 (SR-98)** is a 56.9-mile east-west route that is entirely contained within Imperial County. It traverses the southern portion of Imperial Valley parallel to I-8 and the U.S./Mexico International Border. It begins at I-8 near Ocotillo, intersects SR-111 and SR-7, and terminates at I-8 near Midway Well. It is mostly two lanes with the exception of having four lanes through portions of the City of Calexico. It serves as an alternate route to I-8, providing access to many agricultural areas in the eastern part of the region, and is used for cross-border traffic.
- **State Highway 78 (SR-78)** is an 81.8-mile east-west route that crosses Imperial County from the San Diego County line to the north junction of SR-86, where it then merges and becomes SR-86 for 24 miles, and then becomes SR-78 again to the Riverside County line. It is typically a two-lane conventional highway except for where it is co-designated SR-86, where it was upgraded to a four-lane expressway or four-lane conventional highway.
- **State Highway 86 (SR-86)** is a 90.8-mile north-south route serving Imperial and Riverside counties. It begins at SR-111 near the U.S./Mexico International Border and extends northward (roughly parallel to SR-111) along the western shore of the Salton Sea, where it ends at Avenue 46 in the City of Indio. It is a two-lane road in Imperial County and ends at the Riverside County line as a four-lane expressway. It intersects several State routes, including I-8 and SR-78 (where it shares the 24-mile alignment) and continues north to cross the Imperial County/Riverside County line, intersecting SR-195 and SR-111.
- **State Highway 111 (SR-111)** runs north from the downtown Calexico POE for 64 miles except for a 1.2-mile break within Brawley, where it shares an alignment with SR-78. From the Calexico POE to SR-98, it functions primarily as a city street and provides access to many local businesses.

- **State Highway 7 (SR-7)** is a 6.7-mile north-south route from the Calexico East POE to I-8. It is a four-lane highway with access control at the Calexico East POE, SR-98, and direct access to I-8 for the movement of international commercial goods.
- **State Highway 115 (SR-115)** is a 33.6-mile north-south route that begins at the junction with I-8 east of Holtville and ends at the junction with SR-111 in Calipatria. It includes a segment that shares alignment with SR-78, and it is typically a two-lane conventional highway with some short four-lane segments. It serves as an alternate route to SR-86 and SR-111 and is important in facilitating the movement of interregional agricultural goods and intraregional travel between various cities within the County.

### 3.1.4 Regional Arterials

The regional roadway system also features several important arterials that generally run in either an east-west or north-south orientation. The important north-south arterials (listed from west to east) include Forrester Road, Austin Road, Imperial Avenue, and Dogwood Road. The important east-west arterials in the Project area (listed from south to north) include Jasper Road, Heber Road, McCabe Road, and Ross Road.

### 3.1.5 Scenic Highways

No designated state scenic highways occur in Imperial County; however, portions of I-8, SR-78, SR-111, and Borrego-Salton Seaway within Imperial County are considered eligible for State Scenic Highway Designation.

### 3.1.6 Existing Traffic Volumes

As detailed in Section 2.4 above, Imperial County establishes Level of Service (LOS) standards to assess the performance of a street or highway system and the capacity of a roadway. LOS is a professional industry standard by which the operating conditions of a given roadway segment or intersection are measured. LOS ranges from A through F, where LOS A represents the best operating conditions and LOS F represents the worst operating conditions. LOS A facilities are characterized as having free flowing traffic conditions with no restrictions on maneuvering or operating speeds; traffic volumes are low and travel speeds are high. LOS F facilities are characterized as having forced flow with many stoppages and low operating needs. Additionally, with the growth of Imperial County, transportation management and systems management will be necessary to preserve and increase roadway “capacity.” LOS standards are used to assess the performance of a street or highway system and the capacity of a roadway.

**Table 4** summarizes the existing Annual Average Daily Trips (ADT) for road segments in the vicinity of the proposed Project. Note that Imperial County targets LOS C as the minimum acceptable level of service (Imperial County 2008). Currently Dogwood Road from SR-86 to SR-98 exceeds this guideline, and is currently operating at LOS D.

Table 4. Existing Road Conditions

Segment	Direction	Limits	Capacity at LOS C <sup>1</sup>	ADT <sup>2</sup>	LOS <sup>1</sup>
I-8	E-W	From Forrester Rd. to SR-111	60,000	35,000	B
SR-86	E-W	From Dogwood Rd. to SR-111	44,600	4,200	A
SR-98	E-W	From Dogwood Rd to SR-111	7,100	21,800	F
SR-111	N-S	From I-8 to Northern Calexico City Limits	40,000	34,500	C
McCabe Rd.	E-W	From SR-86 to Dogwood Rd.	7,100	4,146	C
McCabe Rd.	E-W	From Dogwood Rd. to SR-111	7,100	2,607	B
Jasper Rd.	E-W	From SR-111 to Bowker Rd.	7,100	495	A
Forrester Rd.	N-S	From I-8 to McCabe Rd.	7,100	1,366	A
Austin Rd.	N-S.	From I-8 to McCabe Rd.	7,100	1,408	A
Dogwood Rd.	N-S	From SR-86 to SR-98	7,100	8,360	D

Notes:

1. Capacity based on Table 5 (Imperial County Standard Street Classification Average Daily Vehicle Trips) from Imperial County’s General Plan Circulation and Scenic Highways Element (Imperial County 2008)
2. Regional highway volumes on Caltrans facilities were obtained from Caltrans Traffic Census Program (Caltrans 2022). Regional arterial volumes on Imperial County facilities were obtained from Imperial County (2022).

### 3.2 Transit Network

Imperial Valley Transit (IVT) is an inter-city fixed route bus system, subsidized by the Imperial Valley Association of Governments (IVAG), administered by the County Department of Public Works and operated by a public transit bus service. The service is wheelchair accessible and Americans with Disabilities Act compliant. IVT Routes are defined categorized in the following manner:

- Fixed Routes. Fixed routes operate over a set pattern of travel and with a published schedule. The fixed route provides a low cost, reliable, accessible and comfortable way to travel.
- Deviated Fixed Route. In several service areas, IVT operates on a deviated fixed route basis so that persons with disabilities and limited mobility are able to travel on the bus. Passengers must call and request this service the day before service is desired in the communities of Seeley, Ocotillo and the east side of the Salton Sea.
- Remote Zone Routes. Remote zone route operate once a week. These routes are "lifeline" in nature in that they provide connections from some of the more distant communities in the Imperial County area (IVT 2023).

The project site is not within the Fixed Route Transportation system and, therefore, would not receive regular bus service to the project site or within the vicinity of the project site. The nearest IVT bus stop is located at the Imperial Valley Mall, which is approximately four miles north of the project site.

### 3.3 Bicycle Facilities

The *Imperial County Regional Active Transportation Plan* (ICTC 2022) classifies bikeways into four types:

- **Class I: Multi-Use Paths** - Class I multi-use paths (frequently referred to as “bicycle paths”) are physically separated from motor vehicle travel routes, with exclusive rights-of-way for non-

motorized users like bicyclists and pedestrians. They require physical buffers to ensure safety and comfort of the user.

- **Class II: Bicycle Lanes** - Bicycle lanes are one-way facilities that carry bicycle traffic in the same direction as the adjacent motor vehicle traffic. They are typically located along the right side of the street (although can be on the left side) and are between the adjacent travel lane and curb, road edge, or parking lane. They are not physically separated from motor vehicle traffic.
- **Class III: Bicycle Routes** - A bicycle route is a suggested bicycle corridor marked by signs designating a preferred street between destinations. They are recommended where traffic volumes and roadway speeds are low (35 mph or less).
- **Class IV: Separated Bikeways (Cycle Tracks)** - Separated bikeways are bicycle-specific facilities that combine the user experience of a multi-use path with the on-street infrastructure of a conventional bicycle lane. Separated bikeways are physically separated from motor vehicle traffic and are designed to be distinct from any adjoining sidewalk. Physical protection measures can include raised curbs, parkway strips, reflective bollards, or parked vehicles. Separated bikeways can be either one-way or two-way, depending on the street network, available right-of-way, and adjacent land use. The safety of two-way separated bikeways must be carefully evaluated because few motor vehicle drivers are accustomed to two-way separated bikeways and they may tend to look only to the left when deciding whether it is safe to proceed across the separated bikeways.

Although none of the roadway segments within proximity of the Project site are designated a bikeway classification, the *Imperial County Regional Active Transportation Plan* lays out a framework for creating and expanding programs and improvements designed to increase bicycling activity in Imperial County. Although there are no bike paths currently in the Project area, Dogwood Road is a proposed Class I Multi-Use Path.



## SECTION 4 Project Trip Generation

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### 4.1 Construction Trips

Project construction activities will require workers to arrive and depart the Project site daily. Additionally, some heavy-truck traffic will occur to deliver and remove equipment and materials to/from the site. Apart from the direct construction traffic described above, some ancillary trips would also occur related to non-heavy truck deliveries, construction management staff, periodic inspections, etc. Project construction scheduling and phasing is detailed in **Table 2** above. Approximately 15 workers will be onsite during the construction period.

Construction activities at the site is expected to occur between 6:00 AM and 6:00 PM weekdays. Typically, each worker would be expected to arrive and depart the site at least once, resulting in a daily trip rate of two vehicle trips per worker per day for all 15 workers. Given the site's close proximity to Heber, some workers could be expected to leave and return to the site once per day on breaks. Conservatively assuming 50 percent of workers left and returned once per day (e.g., for lunch), this would result in a daily trip rate of four vehicle trips per worker per day for 8 workers. Based on the forecasted work start/stop times, no worker trips would occur during AM commuter peak period of 7:00 AM to 9:00 AM as they would arrive at the site by 6:00 AM. Similarly, the PM commuter peak period is defined as 4:00 PM to 6:00 PM. With a 6:00 PM finish time, all workers would be departing the site after the commuter peak hour has ended. However, for a conservative analysis, all workers traveling to/from the site are assumed to occur during peak AM and PM hours.

Vendor and haul trips consist of heavy vehicle trips to the site includes delivery of construction equipment and materials, as well as transport of equipment and other materials to be removed from the site. Heavy-vehicle trips would not be expected to occur uniformly over the course of the construction period, but rather on occasion as delivery and removal of equipment/materials is required. For the purposes of this temporary construction traffic generation evaluation, 40 daily vendor truck trips and 10 haul trips were conservatively assumed to occur in conjunction with the estimated construction worker load of 15 workers. The daily distribution of truck trips over the course of the 12-hour workday is also expected to be variable; for this analysis, a conservative estimate of 20 percent of daily trips was assumed to occur during both the AM and PM commuter peak hours. As trucks are larger and heavier than passenger cars, the reduced acceleration, braking, and handling characteristics, a Passenger Car Equivalence (PCE) factor of 2.5 is applied to each truck trip to account for the effects of these heavy vehicles within the traffic stream on flat terrain (Per the HCM methodology).

Construction trip generation is summarized in **Table 5** below. Accordingly, the total number of vehicle trips generated by Project construction is conservatively estimated at 165 PCE trips per day, with 91 total trips during the AM peak hour and 91 total trips during the PM peak hour. The estimated number of short-term construction trips is fewer than the 800 daily trips or 200 peak hour trips described by the Imperial County criteria (see Section 1.2 above).

Table 5. Construction Vehicle Trips

Trip Type	Qty	Maximum Daily Volumes (ADT)			AM Peak Hour			PM Peak Hour		
		Rate <sup>1</sup>	PCE <sup>2</sup>	Volume	In	Out	Total	In	Out	Total
<b>Workers</b>	15 Workers	3/worker	1.0	46	46	0	46	0	46	46
<b>Vendor</b>	20 vehicles	2/vehicle	2.5	100	10	10	20	10	10	20
<b>Haul</b>	5 vehicles	2/vehicle	2.5	25	12.5	12.5	25	12.5	12.5	25
<b>Total</b>				<b>165</b>	<b>68.5</b>	<b>22.5</b>	<b>91</b>	<b>22.5</b>	<b>68.5</b>	<b>91</b>

Notes:

1. Trip generation rate is calculated at roughly 3 trips/worker (assumed 50 percent of 15 workers leave/return once during the day) for an estimate of 46 total worker trips, and 2 trips/vehicle (in/out) for vendor and haul trips.
2. PCE = Passenger Car Equivalence Factor

## 4.2 Operations Trips

As detailed in Section 1.3, once the proposed Project is complete, the site will be staffed with 1-2 onsite employees. The daily trip rates used for determining the Project’s operations worker trip generation are based on the 10th Edition of ITE Trip Generation manual for General Light Industrial workers. Deliveries of materials required for operations to the site would vary and would be sporadic throughout the work week. However, for a conservative analysis, it is assumed that one delivery of materials per day will be supplied to the Project site (i.e., one vendor truck per day). These vendor trips would generally not occur during peak hours but are considered as such herein for a conservative analysis. **Table 6** provides the estimated average daily on-road Project trip generation (i.e., trips to and from the site) for operation of the proposed Project. As shown in **Table 6**, the estimated number of trips associated with long-term operation of the Project is fewer than the 800 daily trips or 200 peak hour trips described by the Imperial County criteria (see Section 2.4 above).

Table 6. Operations Vehicle Trips

Trip Type	Qty	Maximum Daily Volumes (ADT)			AM Peak Hour			PM Peak Hour		
		Rate <sup>1</sup>	PCE <sup>2</sup>	Volume	In	Out	Total	In	Out	Total
<b>Workers<sup>1</sup></b>	2 Workers	3.05/worker	1.0	6	6	0	6	0	6	6
<b>Vendor</b>	1 vehicle	2/vehicle	2.5	5	2.5	2.5	5	2.5	2.5	5
<b>Total</b>				<b>11</b>	<b>8.5</b>	<b>2.5</b>	<b>11</b>	<b>2.5</b>	<b>8.5</b>	<b>11</b>

Notes:

1. The daily trip rates used for determining the project’s operation worker trip generation are based on the 10th Edition of ITE Trip Generation manual for General Light Industrial workers.
2. PCE = Passenger Car Equivalence Factor

## 4.3 VMT Assessment

Construction of the proposed facilities may result in nominal and short-term increases in vehicle trips by construction workers and construction vehicles on area roadways. These trips would include construction workers commuting to and from the Project Site, haul truck trips associated with the transfer and disposal of materials, and material and equipment deliveries. The number of construction-

related trips would vary each day, depending on construction phase, planned activity, and material needs. **Table 7** summarizes the maximum estimated Project daily VMT for construction and operations.

Table 7. Maximum Project Daily VMT

Trip Type	Number of One-Way Trips	One-Way Trip Length (miles) <sup>2</sup>	Daily VMT (miles)
Workers <sup>1</sup>	46	10.2	469
Vendor	40	225	9,000
Haul	2	20	40
<b>Temporary Construction Maximum Total Daily VMT</b>			<b>9,509</b>
Workers <sup>1</sup>	6	10.2	61.2
Vendor	2	11.9	23.8
Haul <sup>3</sup>	0	20	0
<b>Operations Total Daily VMT</b>			<b>85</b>

Notes:

1. The daily trip rates used for determining the project’s construction and operation worker trip generation are based on the 10th Edition of ITE Trip Generation manual for General Light Industrial workers. A maximum of 15 construction workers are assumed and 2 operational workers for this conservative estimate.
2. Trip lengths consist of default CalEEMod values with exception of vendors for delivery of Project equipment during construction, with deliveries of solar panels, geothermal equipment, etc. assumed to originate at Port of Long Beach, approximately 225 miles from Project site.
3. All truck trips are assigned to vendor deliveries.

In their Technical Advisory on Evaluating Transportation Impacts on CEQA (December 2018), the Governor’s Office of Planning and Research (OPR) recommends the use of VMT metrics when analyzing land use projects and plans. Absent substantial evidence indicating that a project would generate a potentially significant level of VMT, or inconsistency with a Sustainable Communities Strategy (SCS) or general plan, projects that generate or attract fewer than 110 trips per day generally may be assumed to cause a less-than significant transportation impact. Per CEQA Guidelines, §15064.3 subdivision (a), ‘vehicle miles traveled’ refers to the amount and distance of automobile travel attributable to a project.” Here, the term “automobile” refers to on-road passenger vehicles, specifically cars and light trucks and is not applied for heavy-duty trucks. Accordingly, construction of the Project would result 46 on-road passenger vehicle trips and operations would result in 6 daily passenger vehicle trips which is much fewer than the screening threshold for small project of 110 on-road passenger vehicle trips. As such, the Project can be assumed to result in less than significant impacts on transportation and circulation.

#### 4.4 Traffic Impacts

Lone site access is provided via Dogwood Road, which is classified as a Regional Arterial in the Imperial County Long Range Transportation Plan (2014). As summarized in **Table 4** above, the ADT on Dogwood Road from SR-86 to SR-98 is approximately 8,360 vehicles per day and currently at a LOS D. LOS D indicates there is increased speed reduction, and significant platooning of vehicles. The presence of Project-related construction trucks, with their slower speeds and larger turning radii, may temporarily reduce roadway capacities in the immediate vicinity of the Project site. These nominal impacts of construction traffic would be most noticeable in the immediate vicinity of the Project site and less noticeable farther away and on regional roadways. Construction traffic-related impacts would be

temporary and only occur during the construction phase (35 months). Although Project construction would cause incremental, short-term increases in traffic, construction-related trips are expected to be approximately 165 per day and well under the thresholds for developing a transportation management plan (i.e., 800 commercial/industrial trips [Imperial County 2007]). In addition, the Project would generate less than 110 passenger vehicle trips per day which can be assumed to not result in significant transportation impacts per CEQA Guidelines, §15064.3. Therefore, Project construction and operation would not conflict with any applicable transportation plans (i.e., Imperial County State Transportation Improvement Plan [ICTC 2022]) or contribute to a long-term decrease in LOS.

The medium voltage distribution cable from the Dogwood solar facility to the Dogwood geothermal plant site would cross Dogwood Road overhead and be attached via trays to the existing pipeline that runs west before turning north to cross the Beech Drain and Main Canal at the existing above-ground pipeline span (with an overhead crossing over Willoughby Road). The cable would continue to follow the existing pipeline alignment and connect into the new Dogwood OEC. No new footings or foundations are required for the cable trays. The overhead road crossings at Dogwood Road and Willoughby Road may require an encroachment permit from the County Public Works Department for any work onto, into or within the County road or street right of way. For any work requiring an encroachment permit, a Temporary Traffic Control Plan would be developed and submitted to the County Public Works Department for approval. The Temporary Traffic Control Plan would include measures to mitigate traffic impacts to the satisfaction of the County Public Works Department. Traffic control would be in accordance with the current California Temporary Traffic Control Handbook or as directed by the Imperial County Traffic Engineer. Further, all other proposed facilities would be constructed within the property boundaries of the Project site and would not affect emergency vehicle access to the facility or any roadway. Emergency vehicle access is identified and designated at the Dogwood site, and these areas would not be changed as result of the proposed developments. Therefore, no impacts to emergency access to the plant site or surrounding area would occur under the Project.

## SECTION 5 Conclusions

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Based on the VMT Assessment and the Imperial County guidelines, the project meets the VMT project type screening criteria for small projects as it would generate less than 110 trips per day. Therefore, the proposed Project meets the applicable screening criteria which allows a determination of a less-than-significant impact on VMT, thus a project-specific VMT assessment is not required. In addition, the Project would generate a total of 91 AM Peak Hour trips and 91 PM Peak Hour trips during construction. Based on existing traffic volumes on adjacent roadways, the presence of Project-related construction trucks, with their slower speeds and larger turning radii, may temporarily reduce roadway capacities in the immediate vicinity of the Project site. These nominal impacts of construction traffic would be most noticeable in the immediate vicinity of the Project site and less noticeable farther away and on regional roadways. Construction traffic-related impacts would be temporary and only occur during the construction phase (35 months). However, construction-related trips are expected to be approximately 165 per day and well under the thresholds for developing a transportation management plan (i.e., 800 commercial/industrial trips [Imperial County 2007]). The overhead road crossings at Dogwood Road and Willoughby Road may require an encroachment permit from the County Public Works Department for any work onto, into or within the County road or street right of way. For any work requiring an encroachment permit, a Temporary Traffic Control Plan would be developed and submitted to the County Public Works Department for approval. The Temporary Traffic Control Plan would include measures to mitigate traffic impacts to the satisfaction of the County Public Works Department. Traffic control would be in accordance with the current California Temporary Traffic Control Handbook or as directed by the Imperial County Traffic Engineer. Further, all other proposed facilities would be constructed within the property boundaries of the Project site and would not affect emergency vehicle access to the facility or any roadway. Emergency vehicle access is identified and designated at the Dogwood site, and these areas would not be changed as result of the proposed developments. Therefore, no impacts to emergency access to the plant site or surrounding area would occur under the Project.

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