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| **Description:** | Includes a redline and clean version of the updated Appendix N Air Quality and Greenhouse Gas Emissions Study, provided in response to SUP DR AQ-7 as Appendix D of Supplemental Response Set 1.<br>Includes updates to Appendix N-2 Air Quality and Greenhouse Gas Emissions Calculations, provided in response to SUP DR AQ-7 as Appendix D of Supplemental Response Set 1. |
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| **Docketed Date:** | 12/13/2024 |

# Appendix D - Redline

SUP DR AQ-7 Updated Appendix N

# Darden Clean Energy Project

## Air Quality and Greenhouse Gas Emissions Study

*prepared for*

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**October 2023 - Updated December 2024**

RINCON CONSULTANTS, INC. SINCE 1994

# Table of Contents



## Tables

## Figures



## Appendices

# 1 Project Description

## 1.1 Introduction

This study analyzes the air quality and greenhouse gas (GHG) emissions impacts of the proposed Darden Clean Energy Project (Project) in unincorporated Fresno County, California. Rincon Consultants, Inc. (Rincon) prepared this study under contract to IP Darden I, LLC and Affiliates (Applicant), wholly owned subsidiaries of Intersect Power, LLC for use in support of California Environmental Quality Act (CEQA) compliance for the Project and the study adheres to the California Energy Commission (CEC) requirements for Opt-In Applications (Title 20, California Code of Regulations [CCR], Section 1704, Appendix B). The purpose of this study is to analyze the Project's air quality and GHG impacts related to both temporary construction activity and long-term operation of the Project. Table 1 provides a summary of potential Project impacts.

**Table 1 Summary of Impacts**

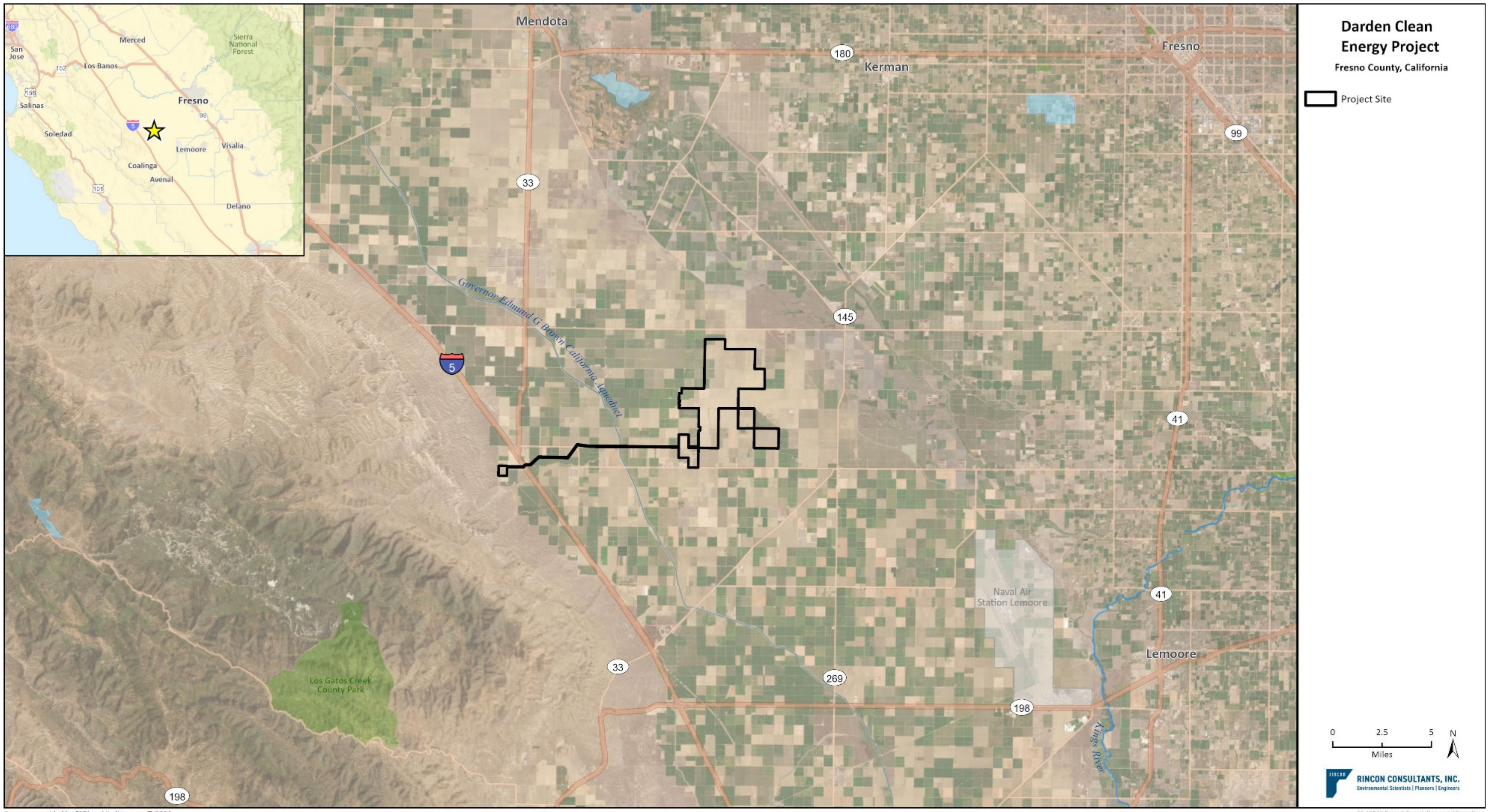
| Impact Statement | Proposed Project's Level of Significance | Mitigation |
|---|---|---|
| **Air Quality** | | |
| Conflict with or obstruct implementation of the applicable air quality plan? | Potentially significant impact | Less than significant with mitigation (AQ-1 & AQ2) |
| Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard? | Potentially significant impact | Less than significant with mitigation (AQ-1 &AQ-2) |
| Expose sensitive receptors to substantial pollutant concentrations? | Potentially significant impact | Less than Significant with Mitigation (AQ-3) |
| Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people? | Less than significant impact | None |
| **Greenhouse Gas Emissions** | | |
| Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? | Less than significant impact | None |
| Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases? | No impact | None |

## 1.2 Project Location

The Project site is an irregular shape, located in an agricultural area of unincorporated Fresno County south of the community of Cantua Creek (Figure 1). The proposed solar facility, ~~and Options 1 and 2~~ BESS, and step-up substation~~, and green hydrogen facility component~~ sites would be located on approximately 9,100 acres of land currently owned by Westlands Water District, between South Sonoma Avenue to the west and South Butte Avenue to the east. The proposed approximately ~~10- to~~ 15-mile gen-tie line would span west from the intersection of South Sonoma Avenue and West Harlan Avenue to immediately west of Interstate 5 (I-5), where it would connect to the proposed utility switchyard along Pacific Gas and Electric Company (PG&E)'s Los Banos-Midway #2 500-kV transmission line (Figure 2). ~~The alternate green hydrogen facility site being considered is located adjacent to the proposed utility switchyard site.~~

Land cover types are predominantly retired agricultural lands that have been irregularly farmed over the last 10 years and seasonally or annually disked when not growing crops, and associated dirt roads, field and road shoulders, basins, ditches, and berms. Some active farming occurred in limited areas on the Project site during 2023. Surrounding properties include retired and active agricultural lands. The gen-tie line spans privately-owned land on the western portion of the Project site with land-cover types including active agriculture. The California Aqueduct bisects the gen-tie parcels, running generally north-south. Compacted dirt and paved roads border and separate each land-cover type.

## Figure 1 Regional Location

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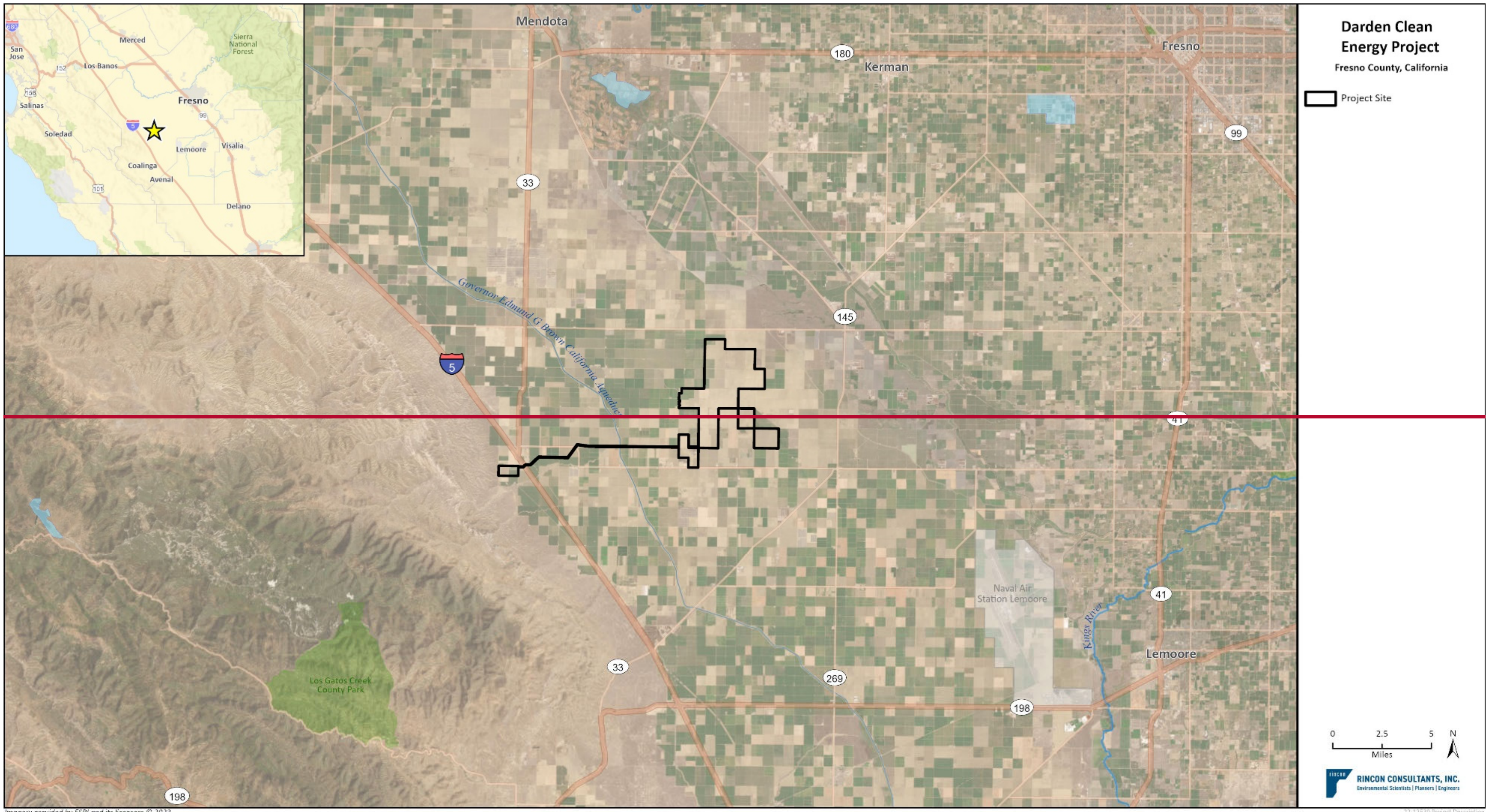


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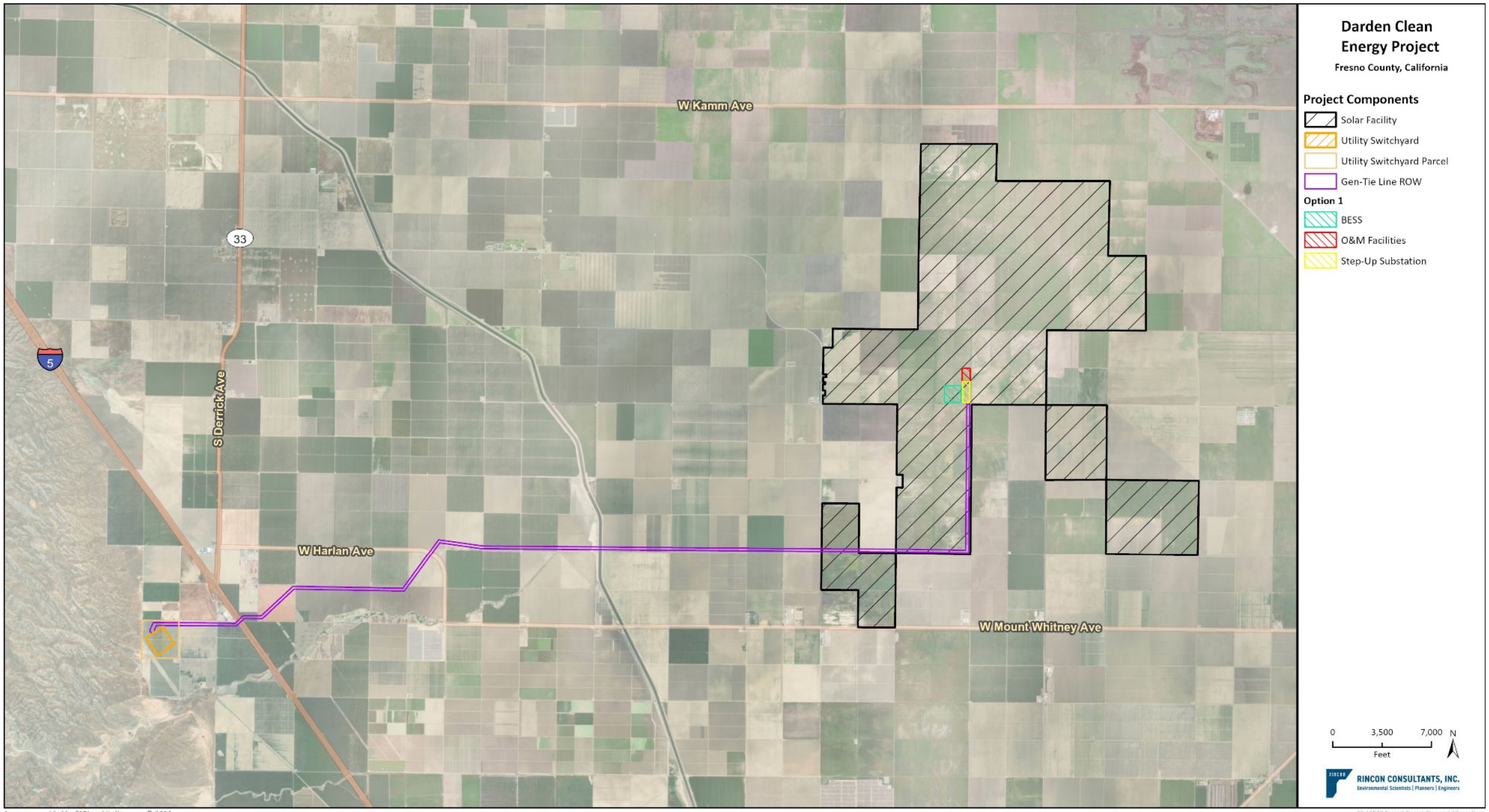
**Figure 2 Project Site**

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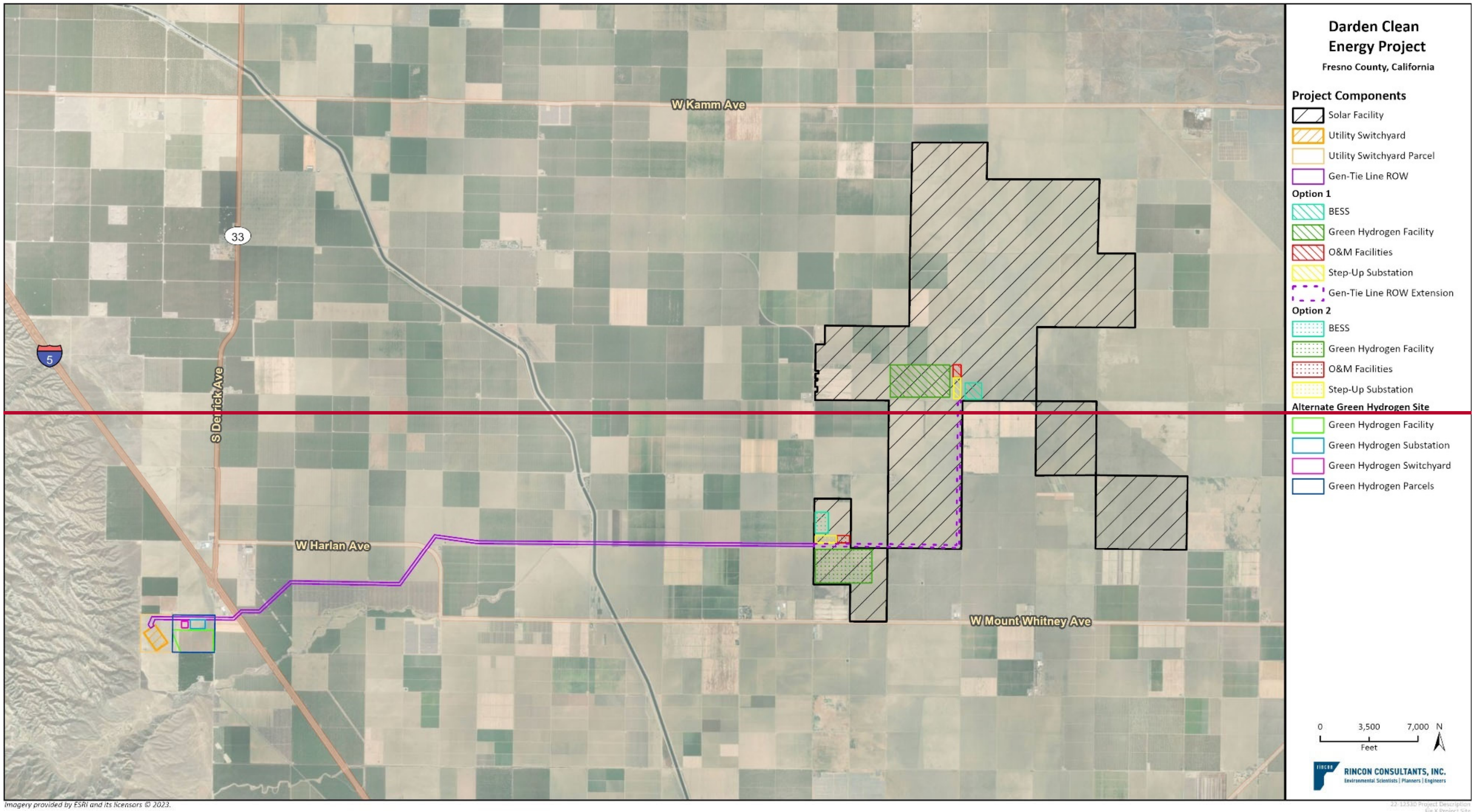
Darden Clean Energy Project
Fresno County, California
Project Components
Solar Facility
Utility Switchyard
Utility Switchyard Parcel
Gen-Tie Line ROW
Option 1
BESS
Green Hydrogen Facility
O&M Facilities
Step-Up Substation
Gen-Tie Line ROW Extension
Option 2
BESS
Green Hydrogen Facility
O&M Facilities
Step-Up Substation
Alternate Green Hydrogen Site
Green Hydrogen Facility
Green Hydrogen Substation
Green Hydrogen Switchyard
Green Hydrogen Parcels
0 3,500 7,000
Feet
N
RINCON CONSULTANTS, INC.
W Kamm Ave
33
5
S Derrick Ave
W Harlan Ave
W Mount Whitney Ave
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# 1.3 Project Description

The Project consists of the construction, operation, and eventual repowering or decommissioning of a 1,150-megawatt (MW) solar photovoltaic (PV) facility, an up to 4,600-megawatt-hour (MWh) battery energy storage system (BESS), ~~an up to 1,150-MW green hydrogen facility,~~ a 34.5-500-kilovolt (kV) grid step-up substation, a ~~10- to~~ 15-mile 500 kV generation intertie (gen-tie) line, a 500-kV utility switchyard along the PG&E Los Banos-Midway #2 500-kV transmission line, and appurtenances.

Project construction is anticipated to take between 18 to 36 months to complete and the Project would be operational by 2027 or 2028. The Project would include the following major components:

- **Solar Facility, Step-Up Substation, and Gen-tie**
    - Construct a 1,150 MW solar PV facility, consisting of approximately 3,100,000 solar panels, inverter-transformer stations, and an electrical collection system. The collection cables would be buried underground in a trench about 4-feet deep, with segments installed overhead on wood poles to connect all of the solar facility development areas to the on-site step-up substation.
    - Construct a new step-up substation to step-up the medium voltage of the PV collector system from 34.5 kV to 500 kV, located on approximately 20 acres. ~~Two locations (Options 1 and 2 sites) are being considered for the step-up substation.~~
    - Construct operations and maintenance facilities.
    - Construct an approximately ~~10- to~~ 15-mile 500-kV, gen-tie line, consisting of either monopole tubular steel poles of steel H-frame structures and dead-end structures, to interconnect the step-up substation to the new utility switchyard. The gen-tie line would be located within an up to 275-foot-wide corridor.

- **BESS**
    - Construct a battery storage system capable of storing up to 1,150 MW of electricity for four hours (up to 4,600 MWh), located on approximately 35 acres. ~~Two locations (Options 1 and 2 sites) are being considered for the BESS.~~

- ~~**Green Hydrogen Facility**~~
    - ~~Construct an up to 1,150-MW green hydrogen generator, consisting of an electrolyzer and water treatment plant with reverse osmosis and electrodeionization and ancillary equipment such as filters, storage tanks, backwash systems and chemical dosing systems.~~
    - ~~Three locations are being considered for the green hydrogen facility. Option 1 or Option 2 sites would be approximately 225 acres in size and would be located within the solar facility. In addition, an approximately 100-acre alternate site located west of I-5 is being considered. If the alternate site is selected, it would include the construction of a substation and switchyard on approximately 20 additional acres.~~

- **Utility Switchyard**
    - Construct a PG&E-owned switchyard, consisting of high-voltage circuit breakers, switches, and series capacitor line compensation equipment in a breaker-and-half configuration, to electrically connect the Project's generation onto PG&E's 500-kV transmission network. The utility switchyard would be located on approximately ~~40~~ 50 acres.

The Project would operate for approximately 35 years, at which time Project facilities would be either repowered or decommissioned. Following decommissioning, the Project site would be restored and reclaimed to the extent practicable to pre-construction conditions consistent with site lease agreements.

The Project previously included construction of an up to 1,150-MW green hydrogen generator which has since been removed from the Project. The analysis includes the construction and operation of the green hydrogen facility; therefore, it is mentioned here for clarification and informational purposes. The emissions presented herein are inclusive of the green hydrogen facility and are considered conservative.

## Solar Facility

### *Photovoltaic Panels and Support Structures*

The solar facility would utilize either mono-facial or bi-facial panels, which would be mounted in a portrait orientation as single panels or mounted in a landscape orientation and stacked two high on a north-south oriented single-axis tracking system that would track the sun from east to west during the day. Panels would be arranged in strings with a maximum height of 10 feet at full tilt or slightly higher due to topography or hydrology. The single axis tracking system would be oriented along a north/south axis with panels facing east in the early morning, lying flat during high noon, and facing west during later afternoon and evening hours. Spacing between each row would be a minimum of ~~18~~ 10 feet. The solar panel array would generate electricity directly from sunlight, which would be collected, converted to alternating current (AC), stored, and delivered to the on-site step-up substation. Structures supporting the PV panels would consist of steel piles (e.g., cylindrical pipes, H-beams, helical screws, or similar structures). The piles typically would be spaced ~~10~~18-feet apart. For the tracking system, piles would be installed to a height of approximately 4- to 6-feet above grade (minimum 1 foot between bottom edge of panel and ground but could be higher to compensate for terrain variations and clearance for overland flow during stormwater events ~~due to water/flooding~~).

### *Inverters, Transformers, and Electrical Collection System*

The solar facility would be designed and laid out primarily in sub-arrays installed in rows, ranging in capacity from 4 to 7 MW. Each sub-array would include a direct current (DC) to AC inverter and medium voltage transformer equipment area (i.e., inverter-transformer station) measuring 40 feet by 25 feet. As necessary, sub-arrays would be designed and sized as appropriate to accommodate the irregular shape of the Project site. The precise sub-array dimensions and configuration would be dependent on available technology and market conditions. Each sub-array would include an inverter-transformer station constructed on a concrete pad or steel skid centrally located within the surrounding PV sub-arrays of that block. Each inverter transformer station would contain an inverter, a transformer, a battery enclosure, and a switchboard. If required based on site meteorological conditions, an inverter shade structure would be installed at each pad. The shade structure would consist of wood or metal supports and a durable outdoor material shade structure (metal, vinyl, or similar). The shade structure, if utilized, would extend up to 10-feet above the ground surface.

Panels would be electrically connected into panel strings using wiring secured to the panel racking system. Underground cables would be installed to convey the DC electricity from the panels via combiner boxes or combiner harnesses with a trunk bus system located throughout the PV sub-arrays, to inverters that would convert the DC to AC electricity. The output voltage of the inverters would be stepped up to the required collection system voltage at the medium voltage pad mount transformer located in close proximity to the inverter. The 34.5-kV level collection cables would be buried underground in a trench about 4 feet deep, with segments installed overhead on wood poles to connect all of the solar facility development areas to the on-site step-up substation, which may or may not involve an overhead or underground road crossing. Thermal specifications require 10 feet of spacing between the medium voltage lines, and in some locations closer to the on-site step-up substation interconnection, more than 20 medium voltage AC lines run in parallel. In locations where the collection system crosses a road or pipelines overhead, direct embedded wood poles would be used on a case-by-case basis. Wood poles spaced up to 250-feet apart could be installed on the site. The typical height of the poles would be approximately 60 to 100 feet, with an embedment depth of 10 to 15 feet depending on the type of crossing, and diameters varying from 12 to 20 inches.

### Step-Up Substation

The step-up substation would step-up the medium voltage of the PV collector system from 34.5 kV to 500 kV. The step-up substation would be located on approximately 20 acres within the solar facility, as shown in Figure 2.

The step-up substation would terminate the medium voltage solar feeders to several common medium voltage busses and transform the power at these busses to the high voltage required for transmission on the gen-tie line to the utility switchyard.

The internal arrangements for the step-up substation would include:

- Eight p~~P~~ower and auxiliary transformers with foundations
- Prefabricated control building(s) to enclose the protection and control equipment, including relays and low voltage switchgear (each building ~~measuring~~ is approximately 20 feet by 8~~4~~0 feet, and 10 to 20 feet high)
- Metering stand
- Capacitor bank(s)
- ~~C~~Nine circuit breakers and disconnect switches
- Up to two microwave towers, approximately 18 feet by 18 feet and up to 200-feet tall, mounted with an antenna up to 15 feet in diameter
- Dead-end structure(s) up to 100 feet in height to connect the step-up substation to the grid

### Gen-Tie

The Project would include a 500-kV, gen-tie line to interconnect the step-up substation to the proposed utility switchyard and is anticipated to be approximately ~~10 miles long but may be up to~~ 15 miles long~~, depending on the location of the step-up substation (Option 1 or Option 2)~~. The 500-kV, gen-tie line would be located within an up to 275-foot right-of-way, extending west from the solar facility across privately administered lands, across I-5, and into the proposed utility switchyard. The gen-tie line would be constructed with either monopole tubular steel poles (TSP) or steel H-frame strucutres. Gen-tie structures would be at least 120-feet tall, with a maximum height of 200 feet. There would be a total of approximately 80 monopole or H-frame structures, in addition to ~~poles and~~ dead-end structures. The total number of gen-tie ~~poles~~ structures would be determined during final design engineering.

### BESS

The BESS would be capable of storing up to 1,150 MW of electricity for 4 hours (up to 4,600 MWh), requiring up to 35 acres that would be located near the step-up substation to facilitate interconnection and metering. The storage system would consist of battery banks housed in electrical enclosures and buried electrical conduit. ~~Up to~~Approximately 1,220 electrical enclosures measuring approximately 40 feet or 52 feet by 8 feet and 8.5 feet high would be installed on ~~concrete~~ level foundations ~~designed for secondary containment~~. The Project ~~could use any commercially available battery technology, including but not limited to lithium ion, LFP (lithium iron phosphate), NMC (nickel manganese cobalt), and NCA (nickel cobalt aluminum) batteries~~would use the Tesla Megapack 2 XL battery technology. Battery systems would require air conditioners or heat exchangers and inverters. In addition, a 15,000-gallon water tank is anticipated for each BESS unit/area.

## ~~Green Hydrogen Facility~~

~~The primary components of the green hydrogen facility will include an electrolyzer and a water treatment plant (WTP). The WTP will have reverse osmosis (RO) and electrodeionization facilities and ancillary equipment such as filters, storage tanks, backwash systems and chemical dosing systems. Additionally, the electrolyzer would include various electrical equipment such as transformers and rectifiers for the electrolyzer cell stacks. A dry cooling system and chiller would be used to reject heat from this equipment. Furthermore, a hydrogen dryer may be required to reduce the moisture content of the hydrogen product. Hydrogen can be stored, transported, and utilized as a compressed gas, as a liquid, or in chemical compounds. The approach to storage and transport will depend on the supply and end user requirements (i.e., storage in mobile applications will differ from storage at electrolysis production sites, or within a gas network). If required, the electrolyzer facility will include compression and/or liquefaction units to prepare the green hydrogen for transport. These compression units would consist of a centrifugal, axial, rotary, or ionic compressor, a liquefier/compressor coldbox, liquid nitrogen storage, and storage tanks for both pre-treated gaseous hydrogen and post-treated liquid/compressed hydrogen.~~

~~If the alternate green hydrogen component site is selected, the Project would include construction and operation of a green hydrogen-specific substation and switchyard with similar components to those described above for the step-up substation. The alternate green hydrogen substation and switchyard would be located adjacent to the alternate hydrogen facility on west side of the Project.~~

## Utility Switchyard

One utility-owned switchyard, ~~approximately 1,000 by 1,600 feet (~~approximately ~~40~~ 50 acres~~)~~ in size would serve as the facility required to electrically connect the Project generation onto the utility's 500-kV transmission network. As shown in Figure 2, the utility switchyard would be located on the west side of the Project and serve as a termination point for the Project gen-tie and will initially loop in the Los Banos-Midway #2 500-kV transmission line. The utility switchyard would contain approximately five (5) 500 kV ~~utilize high-voltage~~ circuit breakers and would be surrounded by a new security wall or chain link barbed wire security fence up to approximately 20-feet in height with a secure gate accessible only by PG&E staff. ~~, switches, and series capacitor line compensation equipment in a breaker-and-a-half (BAAH) configuration and would be designed and constructed in alignment with the interconnecting utility's standards.~~

Structural components within the ~~BAAH~~ utility switchyard area would include:

- One ~~140~~199-foot-tall, free-standing digital microwave antenna (radio tower) to support Supervisory Control and Data Acquisition System communication between the switchyard and the off-site PG&E Operations Center
- Series capacitor banks (sizing to be determined by utility requirements)

- ~~Ten~~ Approximately fifteen (15) 500-kV steel A-frame dead-end poles up to 150 feet in height with foundations ~~up to~~approximately 20-feet deep or more
- ~~Ten 500 kV steel H-frame dead-ends poles up to 150 feet in height with foundations up to 20-feet deep or more~~
- Busbar (a conducting bar that carries heavy currents to supply several electric circuits)
- Two (2) ~~M~~modular protection automation and control (MPAC) ~~building~~enclosure(s) approximately 150 feet by 25 feet by 12-feet tall for PG&E's substation control and protection equipment. MPAC building will be installed on a concrete foundation
- Two (2) ~~S~~switchyard battery enclosure area(s) approximately 34~~-~~-feet by 16~~-~~-feet by 12-feet tall
- Five (5)~~C~~ 500 kV circuit breakers and air disconnect switches
- On-site stormwater retention pond (1,3~~0~~00 feet by 1~~0~~30 feet) for temporary run-off storage during rainfall events
- ~~Chain-link or similar security fencing up to 8-feet tall and two separate access gates plus one personnel gate~~ New security wall or chain link barbed wire security fence up to approximately 20-feet in height with a secure gate accessible only by PG&E staff

# 1.4 Construction Activities

Construction of all Project components would occur between 18 to 36 months, initiating in late 2025 or early 2026 with the facility placed into service by 2027 or 2028 depending on the construction schedule. Construction of the Project would include the following types of activities:

- Solar Facility, Step Up Substation, and Gen-tie
  - Phase 1: Site Preparation
  - Phase 2: PV Panel System
  - Phase 3: Inverters, Transformers, Substation, and Electrical
  - Phase 4: Gen-Tie
- BESS Facility (Phase 5)
- ~~Green Hydrogen Facility (Phase 6)~~
- Utility Switchyard (Phase 7)

All construction equipment would be rated United States Environmental Protection Agency (USEPA) Tier 4.

# 1.5 Operational Activities

Once completed, the Project would generally be limited to the following maintenance activities:

- Maintaining safe and reliable solar ~~and clean green hydrogen~~ generation
- Site Security
- Responding to automated electrical alters based on monitored data, including actual versus expected tolerances for system output and other key performance metrics
- Communicating with customers, transmission system operators, and other entities involved in facility operations

The Project would operate continuously, seven days a week, until the anticipated repowering or decommissioning in 35 years. ~~a~~An average of 12 permanent staff associated with the solar facility would be on-site daily, with additional staff during intermittent solar panel washing (17 staff), facility maintenance and repairs (4 staff), and vegetation management activities (12 staff). ~~Up to 12 average permanent staff associated with the solar facility would be on-site daily, with up to seventeen additional staff during intermittent solar panel washing, ongoing facility maintenance and repairs, and vegetation management activities.~~ Up to ~~four~~ 4 average permanent staff associated with the BESS would be on-site daily. ~~In addition, up to 24 average permanent staff would be required for the operation of the green hydrogen facility daily.~~ Alternatively, Project operators would be located off-site and would be on call to respond to alerts generated by the monitoring equipment at the Project site. Security personnel would be on-call. It is anticipated that permanent staff would be recruited from nearby communities in Fresno County. The operation and maintenance (O&M) building would house the security monitoring equipment, including security camera feeds for monitoring the Project 24 hours per day. Equipment repairs could take place in the early morning or evening when the facility would be producing the least amount of energy. Maintenance typically would include the following: Panel repairs; panel washing; maintenance of transformers, inverters, energy storage system, ~~hydrogen components and~~ other electrical equipment; road and fence repairs; and vegetation and pest management. The Applicant would recondition roads approximately once per year, such as after a heavy storm event that may cause destabilization or erosion. Solar panels would be washed as needed (up to four times each year) using light utility vehicles with tow-behind water trailers to maintain optimal electricity production. No heavy equipment would be used during normal operation. O&M vehicles would include trucks (pickup and flatbed), forklifts, and loaders for routine and unscheduled maintenance and water trucks for solar panel washing. Large heavy-haul transport equipment may be brought to the solar facility infrequently for equipment repair or replacement. No helicopter use is proposed during routine operations although they may be used for emergency maintenance or repair activities.

## 1.6 Decommissioning Activities

The facility's equipment has a useful life of approximately 35 years. At that time, the Applicant would seek to either repower or decommission the facility. In order to repower, the facility would likely be optimized to increase the plant's efficiency by replacing inverters with more efficient units, and potentially replacing some of the facility's panels. Ground disturbing work would not be necessary for optimization activities. The Project would be offline for several weeks or months during optimization activities but would subsequently continue delivering electricity to the wholesale market for many decades.

Decommissioning activities would require similar equipment and workforce as construction but would be substantially less intense. The following activities would be involved:

- Removal and transportation of all Project components from the facility site
- Removal of the solar panels, solar panel racking, steel foundation posts and beams, inverters, transformers, overhead and underground cables and lines, equipment pads and foundations, equipment cabinets, and ancillary equipment
- ~~Dismantling and removal of the electrolyzer facility and WTP~~
- Removal of civil facilities, access roads, security fence, and drainage structures and sedimentation basins

# 2 Setting

## 2.1 Environmental Setting

### 2.1.1 Local Climate and Meteorology

The Project site is located in the unincorporated area of western Fresno County near the community of Cantua Creek, which is part of the San Joaquin Valley Air Basin (SJVAB). The SJVAB encompasses the southern half of the California Central Valley and is comprised of eight counties: San Joaquin, Stanislaus, Fresno, Merced, Madera, Kings, Tulare, and western Kern County. The SJVAB is approximately 250 miles long and 35 miles in width (on average) and is bordered by the Sierra Nevada Mountains in the east (8,000 to 14,500 feet in elevation), the Coast Ranges in the west (averaging 3,000 feet in elevation), and the Tehachapi Mountains in the south (6,000 to 8,000 feet in elevation).

The overall climate in the SJVAB is warm and semi-arid. The San Joaquin Valley is in a Mediterranean climate zone. Mediterranean climate zones occur on the west coast of continents at 30 to 40 degrees latitude and are influenced by a subtropical high-pressure area most of the year. Mediterranean climates are characterized by sparse rainfall, which occurs mainly in the winter. There is only one wet season during the year and 90 percent of the precipitation falls during October through April. Snow in the San Joaquin Valley is infrequent and thunderstorms seldom occur. Summers are hot and dry. Summertime maximum temperatures often exceed 100 degrees Fahrenheit (°F) in the San Joaquin Valley. The SJVAB's topography has a dominating effect on wind patterns. Winds tend to blow somewhat parallel to the valley and mountain range orientation. In spring and early summer, thermal low-pressure systems develop over the interior basins east of the Sierra Nevada mountain range, and the Pacific High (a high-pressure system that develops over the central Pacific Ocean near the Hawaiian Islands) moves northward. These meteorological developments and the topography produce the high incidence of relatively strong northwesterly winds in the spring and early summer.

The subtropical high-pressure cell is strongest during spring, summer, and fall and produces subsiding air, which can result in temperature inversions in the San Joaquin Valley. A temperature inversion can act like a lid, inhibiting vertical mixing of the air mass at the surface. Any emissions of pollutants can be trapped below the inversion. Most of the surrounding mountains are above the normal height of summer inversions (1,500 to 3,000 feet). Winter-time high-pressure events can often last many weeks with surface temperatures lowering to 30°F. During these events, fog can be present, and inversions are extremely strong. These wintertime inversions can inhibit vertical mixing of pollutants to a few hundred feet (San Joaquin Valley Air Pollution Control District [SJVAPCD] 2015a).

### 2.1.2 Air Pollutants of Concern

#### Criteria Air Pollutants

The USEPA has identified criteria air pollutants that are a threat to public health and welfare. These pollutants are called "criteria" air pollutants because standards have been established for each of them to meet specific public health and welfare standards. Criteria pollutants that are a concern in the SJVAB are described below.

### *Ozone*

Ozone is a highly oxidative unstable gas produced by a photochemical reaction (triggered by sunlight) between nitrogen oxides ($NO_X$) and reactive organic gases (ROG)/volatile organic compounds (VOC).[1] ROG is composed of non-methane hydrocarbons (with specific exclusions), and $NO_X$ is composed of different chemical combinations of nitrogen and oxygen, mainly nitric oxide and nitrogen dioxide ($NO_2$). $NO_X$ is formed during the combustion of fuels, while ROG is formed during the combustion and evaporation of organic solvents. As a highly reactive molecule, ozone readily combines with many different atmosphere components. Consequently, high ozone levels tend to exist only while high ROG and $NO_X$ levels are present to sustain the ozone formation process. Once the precursors have been depleted, ozone levels rapidly decline. Because these reactions occur on a regional rather than local scale, ozone is considered a regional pollutant. In addition, because ozone requires sunlight to form, it mainly occurs in concentrations considered serious between April and October. Groups most sensitive to ozone include children, the elderly, people with respiratory disorders, and people who exercise strenuously outdoors (USEPA 2021a). Depending on the level of exposure, ozone can cause coughing and a sore or scratchy throat; make it more difficult to breathe deeply and vigorously and cause pain when taking a deep breath; inflame and damage the airways; make the lungs more susceptible to infection; and aggravate lung diseases such as asthma, emphysema, and chronic bronchitis.

### *Nitrogen Dioxide*

$NO_2$ is a by-product of fuel combustion. The primary sources are motor vehicles and industrial boilers, and furnaces. The principal form of $NO_X$ produced by combustion is nitric oxide (NO), but NO reacts rapidly to form $NO_2$, creating the mixture of NO and $NO_2$, commonly called $NO_x$. $NO_2$ is a reactive, oxidizing gas and an acute irritant capable of damaging cell linings in the respiratory tract. Breathing air with a high concentration of $NO_2$ can irritate airways in the human respiratory system. Such exposures over short periods can aggravate respiratory diseases leading to respiratory symptoms (such as coughing, wheezing, or difficulty breathing), hospital admissions, and visits to emergency rooms. Longer exposures to elevated concentrations of $NO_2$ may contribute to the development of asthma and potentially increase susceptibility to respiratory infections. People with asthma and children and the elderly are generally at greater risk for the health effects of $NO_2$ (USEPA 2021a). $NO_2$ absorbs blue light and causes a reddish-brown cast to the atmosphere and reduced visibility. It can also contribute to the formation of ozone/smog and acid rain.

### *Sulfur Dioxide*

Sulfur dioxide ($SO_2$) is included in a group of highly reactive gases known as “oxides of sulfur.” The largest sources of $SO_2$ emissions are from fossil fuel combustion at power plants (73 percent) and other industrial facilities (20 percent). Smaller sources of $SO_2$ emissions include industrial processes such as extracting metal from ore and burning fuels with a high sulfur content by locomotives, large ships, and off-road equipment. Short-term exposures to $SO_2$ can harm the human respiratory system and make breathing difficult. People with asthma, particularly children, are sensitive to these effects of $SO_2$ (USEPA 2021a).

[1] The California Air Resources Board defines VOC and ROG similarly as, “any compound of carbon excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate,” (40 Code of Federal Regulations 51.100) with the exception that VOC are compounds that participate in atmospheric photochemical reactions. For the purposes of this analysis, ROG and VOC are considered comparable in terms of mass emissions, and the term ROG is used in this document.

### Carbon Monoxide

Carbon monoxide (CO) is a localized pollutant found in high concentrations only near its source. The primary source of CO, a colorless, odorless, poisonous gas, is automobile traffic's incomplete combustion of petroleum fuels. Therefore, elevated concentrations are usually only found near areas of high traffic volumes. Other sources of CO include the incomplete combustion of petroleum fuels at power plants and fuel combustion from wood stoves and fireplaces during the winter. When CO levels are elevated outdoors, they can be of particular concern for people with some types of heart disease. These people already have a reduced ability to get oxygenated blood to their hearts in situations where they need more oxygen than usual. As a result, they are especially vulnerable to the effects of CO when exercising or under increased stress. In these situations, short-term exposure to elevated CO may result in reduced oxygen to the heart accompanied by chest pain, also known as angina (USEPA 2021a).

### Particulate Matter

Particulates less than 10 microns in diameter ($PM_{10}$) and less than 2.5 microns in diameter ($PM_{2.5}$) are comprised of finely divided solids and liquids such as dust, soot, aerosols, fumes, and mists. Both $PM_{10}$ and $PM_{2.5}$ are emitted into the atmosphere as by-products of fuel combustion and wind erosion of soil and unpaved roads. The atmosphere, through chemical reactions, can form particulate matter. The characteristics, sources, and potential health effects of $PM_{10}$ and $PM_{2.5}$ can be very different. $PM_{10}$ is generally associated with dust mobilized by wind and vehicles. In contrast, $PM_{2.5}$ is generally associated with combustion processes and formation in the atmosphere as a secondary pollutant through chemical reactions. $PM_{10}$ can cause increased respiratory disease, lung damage, cancer, premature death, reduced visibility, and surface soiling. For $PM_{2.5}$, short-term exposures (up to 24-hours duration) have been associated with premature mortality, increased hospital admissions for heart or lung causes, acute and chronic bronchitis, asthma attacks, emergency room visits, respiratory symptoms, and restricted activity days. These adverse health effects have been reported primarily in infants, children, and older adults with preexisting heart or lung diseases (California Air Resources Board [CARB] 2022a).

### Lead

Lead (Pb) is a metal found naturally in the environment, as well as in manufacturing products. The major sources of Pb emissions historically have been mobile and industrial. However, due to the USEPA's regulatory efforts to remove lead from gasoline, atmospheric Pb concentrations have declined substantially over the past several decades. The most dramatic reductions in Pb emissions occurred before 1990 due to the removal of Pb from gasoline sold for most highway vehicles. Pb emissions were further reduced substantially between 1990 and 2008, with reductions occurring in the metals industries at least partly due to national emissions standards for hazardous air pollutants (USEPA 2013). As a result of phasing out leaded gasoline, metal processing is currently the primary source of Pb emissions. The highest Pb level in the air is generally found near Pb smelters. Other stationary sources include waste incinerators, utilities, and Pb-acid battery manufacturers. Pb can adversely affect the nervous system, kidney function, immune system, reproductive and developmental systems, and cardiovascular system depending on exposure. Pb exposure also affects the oxygen-carrying capacity of the blood. The Pb effects most likely encountered in current populations are neurological in children. Infants and young children are susceptible to Pb exposures, contributing to behavioral problems, learning deficits, and lowered intelligence quotient (USEPA 2021a).

## Toxic Air Contaminants

In addition to the criteria pollutants discussed above, Toxic Air Contaminants (TAC) are a diverse group of airborne substances that may cause or contribute to an increase in deaths or serious illness, or that may pose a present or potential hazard to human health. TACs include both organic and inorganic chemical substances that may be emitted from a variety of common sources, including gasoline stations, motor vehicles, dry cleaners, industrial operations, painting operations, and research and teaching facilities. One of the main sources of TACs in California is diesel engine exhaust that contains solid material known as diesel particulate matter (DPM). More than 90 percent of DPM is less than one micron in diameter (about 1/70th the diameter of a human hair) and thus is a subset of $PM_{2.5}$. Because of their extremely small size, these particles can be inhaled and eventually trapped in the bronchial and alveolar regions of the lungs (CARB 2022b). TACs are different than criteria pollutants because ambient air quality standards have not been established for TACs. TACs occurring at extremely low levels may still cause health effects and it is typically difficult to identify levels of exposure that do not produce adverse health effects. TAC impacts are described by carcinogenic risk and by chronic (i.e., long duration) and acute (i.e., severe but of short duration) adverse effects on human health. People exposed to TACs at sufficient concentrations and durations may have an increased chance of getting cancer or experiencing other serious health effects. These health effects can include asthma, respiratory symptoms, and decreased lung function (CARB 2022b). The Fresno County Department of Public Health has not published health studies specific to potentially affected populations within six miles of the Project site related to the health effects of TACs or respiratory illnesses, cancers, or related diseases (County of Fresno 2023).

## Dust-related Concerns

### *Valley Fever*

Valley Fever or coccidioidomycosis is caused locally by the microscopic fungus *Coccidioides immitis (C. immitis)*. The *Coccidioides* fungus resides in the soil in the southwestern United States (U.S.), northern Mexico, and parts of Central and South America. During drought years, the number of organisms competing with *C. immitis* decreases, and *the C. immitis* remains alive but dormant. When rain finally occurs, the fungal spores germinate and multiply more than usual because of fewer other competing organisms. Later, the soil dries out in the summer and fall, and the fungi can become airborne and potentially infectious (Kirkland and Fierey 1996).

Infection occurs when the spores of the fungus become airborne and are inhaled. The fungal spores become airborne when contaminated soil is disturbed by human activities, such as construction and agricultural activities, and natural phenomena, such as windstorms, dust storms, and earthquakes. About 60 percent of infected persons have no symptoms. The remainder develop flu-like symptoms that can last for a month and tiredness that can sometimes last for longer than a few weeks. Common symptoms include fatigue, cough, chest pain, fever, rashes on upper body or legs, headaches, muscle aches, night sweats, and unexplained weight loss (California Department of Public Health 2021). Without proper treatment, Valley Fever can lead to severe pneumonia, meningitis, and even death. Both humans and animals can become infected with Valley Fever, but the infection is not contagious and cannot spread from one person or animal to another (California Department of Public Health 2021).

Diagnosis of Valley Fever is conducted through a sample of blood, other body fluid, or biopsy of affected tissue. Valley Fever is treatable with anti-fungal medicines. Once recovered from the disease, the individual is protected against further infection. Persons at highest risk from exposure are those with compromised immune systems, such as those with human immunodeficiency virus and those with chronic pulmonary disease. Farmers, construction workers, and others who engage in activities that disturb the soil are at highest risk for Valley Fever. Infants, pregnant women, diabetics, people of African, Asian, Latino, or Filipino descent, and the elderly may be at increased risk for disseminated disease. Historically, people at risk for infection are individuals not already immune to the disease and whose jobs involve extensive contact with soil dust, such as construction or agricultural workers and archeologists (Los Angeles County Health Department 2013). Most cases of Valley Fever (over 65 percent) are diagnosed in people living in the Central Valley and Central Coast regions (California Department of Public Health 2021).

There is no vaccine to prevent Valley Fever. However, the California Department of Public Health recommends the following practical tips to reduce exposure (2021):

- Stay inside and keep windows and doors closed when it is windy outside and the air is dusty, especially during dust storms.
- Consider avoiding outdoor activities that involve close contact to dirt or dust, including yard work, gardening, and digging, especially if you are in one of the groups at higher risk for severe or disseminated Valley fever.
- Cover open dirt areas around your home with grass, plants, or other ground cover to help reduce dusty, open areas.
- While driving in these areas, keep car windows closed and use recirculating air, if available.
- Try to avoid dusty areas, like construction or excavation sites.
- If you cannot avoid these areas, or if you must be outdoors in dusty air, consider wearing an N95 respirator (a type of face mask) to help protect against breathing in dust that can cause Valley fever.

However, if in situations where digging dirt or stirring up dust will happen, then the following tips are recommended:

- Stay upwind of the area where dirt is being disturbed.
- Wet down soil before digging or disturbing dirt to reduce dust.
- Consider wearing an N95 respirator (mask).
- After returning indoors, change out of clothes if covered with dirt.
  - Be careful not to shake out clothing and breathe in the dust before washing. If someone else is washing your clothes, warn the person before they handle the clothes.

In 2022, approximately 448 cases of Valley Fever were reported in Fresno County. This is an increase of 43 cases compared to 2021 (405 cases) (California Department of Public Health 2023).

### 2.1.3 Sensitive Receptors

Some receptors are considered more sensitive than others to air pollutants. The reasons for greater than average sensitivity include preexisting health problems, proximity to emissions sources, or duration of exposure to air pollutants. Title 20, CCR, Section 1704, Appendix B defines a sensitive receptor as infants and children, the elderly, and the chronically ill, and any other member of the general population who is more susceptible to the effects of the exposure than the population at large. Schools, hospitals, and convalescent homes are considered relatively sensitive to poor air quality because children, elderly people, and the infirmed are more susceptible to respiratory distress and other air quality-related health problems than the general public. Residential areas are considered sensitive to poor air quality because people usually stay home for extended periods, with greater associated exposure to ambient air quality. Recreational uses are also considered sensitive due to the greater exposure to ambient air quality conditions because vigorous exercise associated with recreation places a high demand on the human respiratory system. Ambient air quality standards were established to represent the levels of air quality considered sufficient, with a margin of safety, to protect public health and welfare. Standards are designed to protect that segment of the public most susceptible to respiratory distress, such as children under 14; the elderly over 65; persons engaged in strenuous work or exercise; and people with cardiovascular and chronic respiratory diseases.

Sensitive receptors are located immediately adjacent to the Project site. The sensitive receptors include single family residents along South Sonoma Avenue, West Cerini Avenue, and West Mount Whitney Avenue. Sensitive receptors identified in the analysis are included in Figure 3.

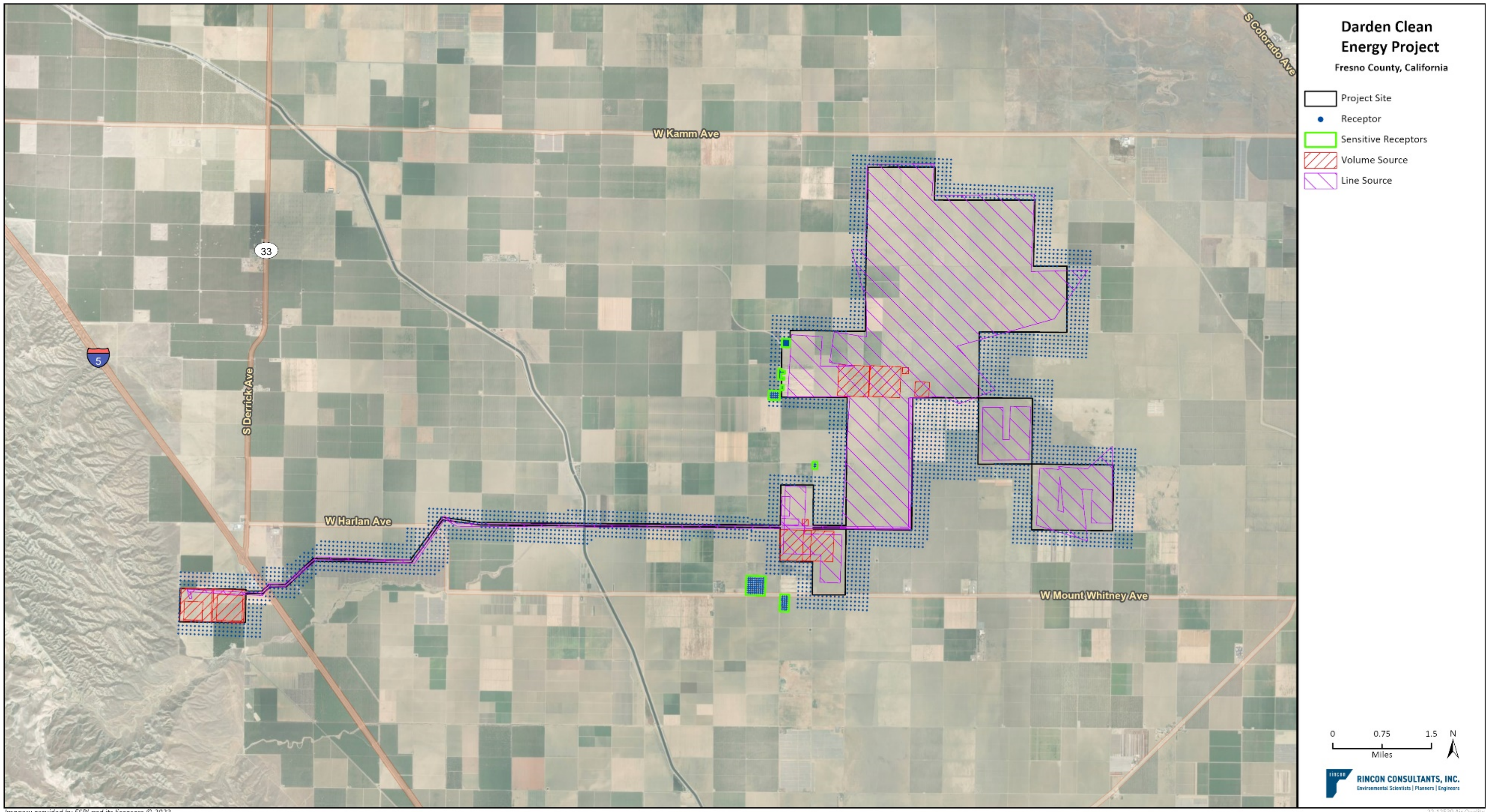
### 2.1.4 Greenhouse Gases

Gases that trap heat in the atmosphere are known as GHGs. GHGs allow sunlight to enter the atmosphere but trap a portion of the outward-bound infrared radiation that warms the air. The process is similar to the effect greenhouses have in raising the internal temperature of the structure. Both natural processes and human activities emit GHGs. The accumulation of GHGs in the atmosphere regulates the Earth's temperature, but emissions from human activities (such as fossil fuel-based electricity production and the use of motor vehicles) have elevated the concentration of GHGs in the atmosphere. Scientists agree that this accumulation of GHGs has contributed to an increase in the temperature of the Earth's atmosphere and to global climate change. Global climate change is a change in the average weather on Earth that can be measured by wind patterns, storms, precipitation, and temperature. Although there is disagreement as to the rate of global climate change and the extent of the impacts attributable to human activities, most scientists agree there is a direct link between increased emissions of GHGs and long-term global temperature increases.

The gases widely seen as the principal contributors to human-induced climate change include carbon dioxide ($CO_2$), methane ($CH_4$), nitrous oxides ($N_2O$), fluorinated gases such as hydrofluorocarbons (HFCs) and perfluorocarbons (PFC), and sulfur hexafluoride ($SF_6$). Water vapor is excluded from the list of GHGs because it is short-lived in the atmosphere, and natural processes, such as oceanic evaporation, largely determine its atmospheric concentrations.

GHGs are emitted by natural processes and human activities. Of these gases, $CO_2$ and $CH_4$ are emitted in the greatest quantities from human activities. Emissions of $CO_2$ are usually by-products of fossil fuel combustion, and $CH_4$ results from off-gassing associated with agricultural practices and landfills. Human-made GHGs, many of which have greater heat-absorption potential than $CO_2$, include fluorinated gases and $SF_6$.

**Figure 3 Sources and Sensitive Receptors**

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Different types of GHGs have varying global warming potentials (GWP). The GWP of a GHG is the potential of a gas or aerosol to trap heat in the atmosphere over a specified timescale (generally 100 years) (USEPA 2021b). Because GHGs absorb different amounts of heat, a common reference gas ($CO_2$) is used to relate the amount of heat absorbed to the amount of the gas emitted, referred to as "carbon dioxide equivalent" ($CO_2e$), which is the amount of GHG emitted multiplied by its GWP. Carbon dioxide has a 100-year GWP of one. By contrast, methane has a GWP of 30, meaning its global warming effect is 30 times greater than $CO_2$ on a molecule per molecule basis (Intergovernmental Panel on Climate Change [IPCC] 2021a).[2]

The use of $SF_6$ in electric utility systems and switchgear, including circuit breakers, poses a concern because this pollutant has an extremely high GWP (one pound of $SF_6$ is the equivalent warming potential of approximately 24,600 pounds of $CO_2$) (IPCC 2021b).[3] $SF_6$ is inert and non-toxic, and is encapsulated in circuit breaker assemblies. $SF_6$ is a GHG with substantial global warming potential because of its chemical nature and long residency time within the atmosphere. However, under normal conditions, it would be completely contained in the equipment and $SF_6$ would only be released in the unlikely event of a failure, leak, or crack in the circuit breaker housing. New circuit breaker designs have been developed over the past several years to minimize the potential for leakage, compared to that of past designs.

## Potential Effects of Climate Change

Globally, climate change has the potential to affect numerous environmental resources though potential impacts related to future air temperatures and precipitation patterns. Scientific modeling predicts that continued GHG emissions at or above current rates would induce more extreme climate changes during the twenty-first century than were observed during the twentieth century. Each of the past three decades has been warmer than all the previous decades in the instrumental record, and the decade from 2000 through 2010 has been the warmest. The observed global mean surface temperature (GMST) from 2015 to 2017 was approximately 1° Celsius (C) higher than the average GMST over the period from 1880 to 1900 (National Oceanic and Atmospheric Administration 2020). Furthermore, several independently analyzed data records of global and regional Land-Surface Air Temperature (LSAT) obtained from station observations jointly indicate that LSAT and sea surface temperatures have increased. Due to past and current activities, anthropogenic GHG emissions have increased global mean surface temperature at a rate of approximately 0.1°C per decade since 1900. In addition to these findings, there are identifiable signs that global warming is currently taking place, including substantial ice loss in the Arctic over the past two decades (IPCC 2023).

According to *California's Fourth Climate Change Assessment*, statewide temperatures from 1986 to 2016 were approximately 0.6 to 1.1°C higher than those recorded from 1901 to 1960. Potential impacts of climate change in California may include reduced water supply from snowpack, sea level rise, more extreme heat days per year, more large forest fires, and more drought years (State of California 2018). In addition to statewide projections, *California's Fourth Climate Change Assessment* includes regional reports that summarize climate impacts and adaptation solutions for nine regions of the state and regionally-specific climate change case studies (State of California 2018). However, while there is growing scientific consensus about the possible effects of climate change at a global and statewide

[2] The IPCC's (2021) *Sixth Assessment Report* determined that methane has a GWP of 30. However, the 2022 Climate Change Scoping Plan published by the CARB uses a GWP of 25 for methane, consistent with the Intergovernmental Panel on Climate Change's (2007) *Fourth Assessment Report*. Therefore, this analysis utilizes the GWPs from the Fourth Assessment Report.

[3] A global warming potential of 23,900 was used to convert emissions to $CO_2e$. This value is based on the global warming potential in the USEPA Mandatory Reporting Program Regulations (40 Code of Federal Regulations Part 98, Subpart A), and deviates from the use of GWPs from the IPCC 6th Assessment Report which was used for the conversion of $CH_4$ and $N_2O$.

level, current scientific modeling tools are unable to predict what local impacts may occur with a similar degree of accuracy. A summary follows of some of the potential effects that could be experienced in California as a result of climate change.

### *Air Quality*

Scientists project that the annual average maximum daily temperatures in California could rise by 2.4 to 3.2°C in the next 50 years and by 3.1 to 4.9°C in the next century (State of California 2018). Higher temperatures are conducive to air pollution formation, and rising temperatures could therefore result in worsened air quality in California. As a result, climate change may increase the concentration of ground-level ozone, but the magnitude of the effect, and therefore its indirect effects, are uncertain. In addition, as temperatures have increased in recent years, the area burned by wildfires throughout the state has increased, and wildfires have occurred at higher elevations in the Sierra Nevada Mountains (State of California 2018). If higher temperatures continue to be accompanied by an increase in the incidence and extent of large wildfires, air quality could worsen. Severe heat accompanied by drier conditions and poor air quality could increase the number of heat-related deaths, illnesses, and asthma attacks throughout the state. However, if higher temperatures are accompanied by wetter, rather than drier conditions, the rains could tend to temporarily clear the air of particulate pollution, which would effectively reduce the number of large wildfires and thereby ameliorate the pollution associated with them (California Natural Resources Agency 2009).

### *Water Supply*

Analysis of paleoclimatic data (such as tree-ring reconstructions of stream flow and precipitation) indicates a history of naturally and widely varying hydrologic conditions in California and the west, including a pattern of recurring and extended droughts. Uncertainty remains with respect to the overall impact of climate change on future precipitation trends and water supplies in California. Year-to-year variability in statewide precipitation levels has increased since 1980, meaning that wet and dry precipitation extremes have become more common (California Department of Water Resources 2018). This uncertainty regarding future precipitation trends complicates the analysis of future water demand, especially where the relationship between climate change and its potential effect on water demand is not well understood. The average early spring snowpack in the western U.S., including the Sierra Nevada Mountains, decreased by about 10 percent during the last century. During the same period, sea level rose over 0.15 meter along the central and southern California coasts (State of California 2018). The Sierra snowpack provides the majority of California's water supply as snow that accumulates during wet winters is released slowly during the dry months of spring and summer. A warmer climate is predicted to reduce the fraction of precipitation that falls as snow and the amount of snowfall at lower elevations, thereby reducing the total snowpack (State of California 2018). Projections indicate that average spring snowpack in the Sierra Nevada and other mountain catchments in central and northern California will decline by approximately 66 percent from its historical average by 2050 (State of California 2018).

### *Hydrology and Sea Level Rise*

Climate change could affect the intensity and frequency of storms and flooding (State of California 2018). Furthermore, climate change could induce substantial sea level rise in the coming century. Rising sea level increases the likelihood of and risk from flooding. The rate of increase of global mean sea levels between 2006 and 2018 is approximately 3.7 millimeters per year, approximately two times the average rate of sea level rise in the twentieth century (IPCC 2023). Global mean sea levels increased by 0.20 meters between 1901 and 2018 (IPCC 2023). Sea levels are rising faster now than in the previous two millennia, and the rise will probably accelerate, even with robust GHG emission control measures. The most recent IPCC report predicts a mean sea level rise of 0.28 to 0.55 meter by 2100 (IPCC 2021a). Between the years of 1901 and 2018, the global mean sea level increased by 0.20 meters with human influence as the likely driver of said increase since at least 1971 (IPCC 2021a). A rise in sea levels could erode 31 to 67 percent of southern California beaches and cause flooding of approximately 370 miles of coastal highways during 100-year storm events. This would also jeopardize California's water supply due to saltwater intrusion and induce groundwater flooding and/or exposure of buried infrastructure (State of California 2018). Furthermore, increased storm intensity and frequency could affect the ability of flood-control facilities, including levees, to handle storm events.

### *Agriculture*

California has an over $50 billion annual agricultural industry that produces over a third of the country's vegetables and two-thirds of the country's fruits and nuts (California Department of Food and Agriculture 2020). Higher $CO_2$ levels can stimulate plant production and increase plant water-use efficiency. However, if temperatures rise and drier conditions prevail, certain regions of agricultural production could experience water shortages of up to 16 percent, which would increase water demand as hotter conditions lead to the loss of soil moisture. In addition, crop yield could be threatened by water-induced stress and extreme heat waves, and plants may be susceptible to new and changing pest and disease outbreaks (State of California 2018). Temperature increases could also change the time of year certain crops, such as wine grapes, bloom or ripen, and thereby affect their quality (California Climate Change Center 2006).

### *Ecosystems and Wildlife*

Climate change and the potential resultant changes in weather patterns could have ecological effects on the global and local scales. Soil moisture is likely to decline in many regions as a result of higher temperatures, and intense rainstorms are likely to become more frequent. Rising temperatures could have four major impacts on plants and animals: timing of ecological events; geographic distribution and range of species; species composition and the incidence of nonnative species within communities; and ecosystem processes, such as carbon cycling and storage (State of California 2018).

## Emissions Inventories

### *Global Emissions Inventory*

Worldwide anthropogenic GHG emissions totaled 47,000 million metric tons (MMT) of $CO_2e$ in 2015, which is a 43 percent increase from 1990 GHG levels (USEPA 2023a). Specifically, 34,522 MMT of $CO_2e$ of $CO_2$, 8,241 MMT of $CO_2e$ of $CH_4$, 2,997 MMT of $CO_2e$ of $N_2O$, and 1,001 MMT of $CO_2e$ of fluorinated gases were emitted in 2015. The largest source of GHG emissions were energy production and fuel use from vehicles and buildings, which accounted for 75 percent of the global GHG emissions. Agriculture uses and industrial processes contributed 12 percent and six percent, respectively. Waste sources contributed three percent and international transportation sources contributed two percent. These sources account for approximately 98 percent because there was a net sink of two percent from land use change (including afforestation/reforestation and emissions removals by other land use activities) (USEPA 2023a).

### United States Emissions Inventory

Total U.S. GHG emissions were 6,558 MMT of $CO_2$e in 2019. Emissions decreased by 1.7 percent from 2018 to 2019. Since 1990, total U.S. emissions have increased by an average annual rate of 0.06 percent for a total increase of 1.8 percent between 1990 and 2019. The decrease from 2018 to 2019 reflects the combined influences of several long-term trends, including population changes, economic growth, energy market shifts, technological changes such as improvements in energy efficiency, and decrease carbon intensity of energy fuel choices. In 2019, the industrial and transportation end-use sectors accounted for 30 percent and 29 percent, respectively, of nationwide GHG emissions; while the commercial and residential end-use sectors accounted for 16 percent and 15 percent of nationwide GHG emissions, respectively, with electricity emissions distributed among the various sectors (USEPA 2023b).

### California Emissions Inventory

Based on the CARB California GHG Inventory for 2000-2019, California produced 418.2 MMT of $CO_2$e in 2019, which is 7.2 MMT of $CO_2$e lower than 2018 levels. The major source of GHG emissions in California is the transportation sector, which comprises 40 percent of the State's total GHG emissions. The industrial sector is the second largest source, comprising 21 percent of the State's GHG emissions, while electric power accounts for approximately 14 percent (CARB 2021). The magnitude of California's total GHG emissions is due in part to its large size and large population compared to other states. However, its relatively mild climate is a factor that reduces California's per capita fuel use and GHG emissions as compared to other states. In 2016, the State of California achieved its 2020 GHG emission reduction target of reducing emissions to 1990 levels, as emissions fell below 431 MMT of $CO_2$e (CARB 2021).

### County of Fresno Municipal Emissions Inventory

In 2012, the County of Fresno County published an inventory of GHG emissions resulting from government operations during the 2010 calendar year. The GHG emissions are broken down by sector and source, which are unique to the operations of Fresno County. The inventory states that emissions for Fresno County government operations were approximately 117,977 metric tons (MT) $CO_2$e in 2010. The inventory shows that the largest municipal source of GHG emissions is solid waste facilities (45 percent), followed by buildings (22 percent) and vehicles (18 percent). The inventory has not been updated since 2012 (Fresno County 2012).

# 2.2 Regulatory Setting

## 2.2.1 Air Quality

### Federal and State Criteria Air Pollutants

The federal Clean Air Act (CAA) and the California Clean Air Act (CCAA) establish ambient air quality standards and establish regulatory authorities designed to attain those standards. As required by the CAA, the USEPA has identified criteria pollutants and has established National Ambient Air Quality Standards (NAAQS) to protect public health and welfare. NAAQS have been established for ozone, CO, $NO_2$, $SO_2$, $PM_{10}$, $PM_{2.5}$, and Pb.

Under the CCAA, California has adopted the California Ambient Air Quality Standards (CAAQS), which are more stringent than the NAAQS for certain pollutants and averaging periods. Table 2 presents the current federal and state standards for regulated pollutants and the SJVAB's attainment status for each standard. California has also established CAAQS for sulfates, hydrogen sulfide, and vinyl chloride.

As required by the federal CAA and the CCAA, air basins or portions thereof have been classified as either "attainment" or "nonattainment" for each criteria air pollutant, based on whether the standards have been achieved. In some cases, an area's status is unable to be determined, in which case the area is designated "unclassified" (USEPA 2022). The air quality in an attainment area meets or is better than the NAAQS or CAAQS. A non-attainment area has air quality that is worse than the NAAQS or CAAQS. States are required to adopt enforceable plans, known as a State Implementation Plan (SIP), to achieve and maintain air quality meeting the NAAQS.

As shown in Table 2, the SJVAB currently is classified as nonattainment for the one-hour state ozone standard as well as for the federal and state eight-hour ozone standards. The SJVAB is also designated as nonattainment for the federal and state annual arithmetic mean and federal 24-hour $PM_{2.5}$ standards. Additionally, the SJVAB is classified as nonattainment for the state 24-hour and annual arithmetic mean $PM_{10}$ standards. The SJVAB is unclassified or classified as attainment for all other pollutant standards (SJVAPCD 2022a).

### Table 2 Federal and State Ambient Air Quality Standards

| | | State Standard | | National Standard | |
|---|---|---|---|---|---|
| Pollutant | Averaging Time | Concentration | SJVAB Attainment Status | Concentration | SJVAB Attainment Status |
| Ozone | 8-Hour<br>1-Hour | 0.070 ppm<br>0.090 ppm | Nonattainment/<br>Severe Nonattainment | 0.070 ppm<br>- | Nonattainment/<br>Extreme[1] |
| Carbon Monoxide (CO) | 1-Hour<br>8-Hour | 9.0 ppm<br>20 ppm | Attainment/<br>Unclassified | 9.0 ppm<br>35 ppm | Attainment/<br>Unclassified |
| Nitrogen Dioxide ($NO_2$) | 1-Hour<br>Annual | 0.180 ppm<br>0.030 ppm | Attainment | 0.100 ppm<br>0.053 ppm | Attainment/<br>Unclassified |
| Sulfur Dioxide ($SO_2$) | 1-Hour<br>3-Hour<br>24-Hour<br>Annual | 0.25 ppm<br>-<br>0.04 ppm<br>- | Attainment | 0.075 ppm<br>0.5 ppm*<br>0.14 ppm<br>0.03 ppm | Attainment/<br>Unclassified |
| Respirable Particulate Matter ($PM_{10}$) | 24-Hour<br>Annual | 50 μg/m$^3$<br>20 μg/m$^3$ | Nonattainment | 150 μg/m$^3$<br>- | Attainment |
| Fine Particulate Matter ($PM_{2.5}$) | 24-Hour<br>Annual | -<br>12 μg/m$^3$ | Nonattainment | 35 μg/m$^3$<br>12 μg/m$^3$ | Nonattainment |
| Lead (Pb) | 30-Day<br>Quarterly | 1.5 μg/m$^3$<br>- | Attainment | -<br>1.5 μg/m$^3$ | No Designation/<br>Classification |

ppm = parts per million; ppb = parts per billion; μg/m$^3$ = micrograms per cubic meter

[1] Though the San Joaquin Valley was initially classified as serious nonattainment for the 1997 8-hour ozone standard, EPA approved Valley reclassification to extreme nonattainment in the Federal Register on May 5, 2010 (effective June 4, 2010).

Source: San Joaquin Valley Air Pollution Control District 2022a

## Regional

### *San Joaquin Valley Air Pollution Control District*

The Project site is located within the jurisdiction of the SJVAPCD, which regulates air pollutant emissions throughout the SJVAB. The SJVAPCD enforces regulations and administers permits governing stationary sources. Pursuant to Assembly Bill 205 subsection 25545.1(b)(1), the CEC retains exclusive authority over permitting and supersedes any applicable statute, ordinance, or regulation of a local air quality management district. In the absence of CEC jurisdiction, the following regional rules and regulations are related to the Project:

- **Regulation VIII (Fugitive $PM_{10}$ Prohibitions)** contains rules developed pursuant to USEPA guidance for "serious" $PM_{10}$ nonattainment areas. Rules included under this regulation limit fugitive $PM_{10}$ emissions from the following sources: construction, demolition, excavation, extraction, and other earth moving activities, bulk materials handling, carryout and track-out, open areas, paved and unpaved roads, unpaved vehicle/equipment traffic areas, and agricultural sources. Table 3 contains control measures that the Applicants would implement during Project construction activities pursuant to *Rule 8021, Construction, Demolition, Excavation, Extraction, and Other Earthmoving Activities*.
- **Rule 2201 (New and Modified Stationary Source Review Rule)** applies to all new stationary sources or modified existing stationary sources that are subject to the SJVAPCD permit requirements. The rule requires review of the new or modified stationary source to ensure that the source does not interfere with the attainment or maintenance of ambient air quality standards.
- **Rule 4101 (Visibility)** limits the visible plume from any source to 20 percent opacity.
- **Rule 4102 (Nuisance)** prohibits the discharge of air contaminants or other materials in quantities that may cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public or which endanger the comfort, repose, health, or safety of any such person or the public.
- **Rule 4601 (Architectural Coatings)** limits volatile organic compound (VOC) emissions from architectural coatings. This rule specifies architectural coatings storage, cleanup, and labeling requirements.
- **Rule 4641 (Cutback, Slow Cure, and Emulsified Asphalt, Paving, and Maintenance Operations)** limits VOC emissions by restricting the application and manufacturing of certain types of asphalt for paving and maintenance operations and applies to the manufacture and use of cutback asphalt, slow cure asphalt and emulsified asphalt for paving and maintenance operations.
- **Rule 9510 (Indirect Source Review)** requires certain development projects to mitigate exhaust emissions from construction equipment greater than 50 horsepower to 20 percent below statewide average $NO_X$ emissions and 45 percent below statewide average $PM_{10}$ exhaust emissions. This rule also requires applicants to reduce baseline emissions of $NO_X$ and $PM_{10}$ emissions associated with operations by 33.3 percent and 50 percent respectively over a period of 10 years (SJVAPCD 2017).

In addition to reducing a portion of the development project's impact on air quality through compliance with District Rule 9510, a developer can further reduce a project's impact on air quality by entering a "Voluntary Emission Reduction Agreement" (VERA) with the SJVAPCD to further mitigate project impacts under CEQA. Under a VERA, the developer may fully mitigate project emission impacts by providing funds to the SJVAPCD, which then are used by the SJVAPCD to administer emission reduction projects (SJVAPCD 2015b).

### Table 3 SJVAPCD Rule 8021 Measures Applicable to the Project

| No. | Measure |
|---|---|
| A.1 | Pre-water site sufficient to limit visible dust emissions (VDE) to 20 percent opacity. |
| A.2 | Phase work to reduce the amount of disturbed surface area at any one time. |
| B.1 | Apply water or chemical/organic stabilizers/suppressants sufficient to limit VDE to 20 percent opacity; or |
| B.2 | Construct and maintain wind barriers sufficient to limit VDE to 20 percent opacity. If using wind barriers, control measure B1 above shall also be implemented. |
| B.3 | Apply water or chemical/organic stabilizers/suppressants to unpaved haul/access roads and unpaved vehicle/equipment traffic areas sufficient to limit VDE to 20 percent opacity and meet the conditions of a stabilized unpaved road surface. |
| C.1 | Restrict vehicular access to the area. |
| C.2 | Apply water or chemical/organic stabilizers/suppressants, sufficient to comply with the conditions of a stabilized surface. If an area having 0.5 acre or more of disturbed surface area remains unused for seven or more days, the area must comply with the conditions for a stabilized surface area as defined in section 3.58 of Rule 8011. |
| 5.3.1 | An owner/operator shall limit the speed of vehicles traveling on uncontrolled unpaved access/haul roads within construction sites to a maximum of 15 miles per hour. |
| 5.3.2 | An owner/operator shall post speed limit signs that meet state and federal Department of Transportation standards at each construction site's uncontrolled unpaved access/haul road entrance. At a minimum, speed limit signs shall also be posted at least every 500 feet and shall be readable in both directions of travel along uncontrolled unpaved access/haul roads. |
| 5.4.1 | Cease outdoor construction, excavation, extraction, and other earthmoving activities that disturb the soil whenever VDE exceeds 20 percent opacity. Indoor activities such as electrical, plumbing, dry wall installation, painting, and any other activity that does not cause any disturbances to the soil are not subject to this requirement. |
| 5.4.2 | Continue operation of water trucks/devices when outdoor construction excavation, extraction, and other earthmoving activities cease, unless unsafe to do so. |
| 6.3.1 | An owner/operator shall submit a Dust Control Plan to the Air Pollution Control Officer (APCO) prior to the start of any construction activity on any site that will include ten acres or more of disturbed surface area for residential developments, or five acres or more of disturbed surface area for non-residential development, or will include moving, depositing, or relocating more than 2,500 cubic yards per day of bulk materials on at least three days. Construction activities shall not commence until the APCO has approved or conditionally approved the Dust Control Plan. An owner/operator shall provide written notification to the APCO within 10 days prior to the commencement of earthmoving activities via fax or mail. The requirement to submit a dust control plan shall apply to all such activities conducted for residential and non-residential (e.g., commercial, industrial, or institutional) purposes or conducted by any governmental entity. |
| 6.3.3 | The Dust Control Plan shall describe all fugitive dust control measures to be implemented before, during, and after any dust generating activity. |
| 6.3.4 | A Dust Control Plan shall contain all the [administrative] information described in Section 6.3.6 of this rule. The APCO shall approve, disapprove, or conditionally approve the Dust Control Plan within 30 days of plan submittal. A Dust Control Plan is deemed automatically approved if, after 30 days following receipt by the District, the District does not provide any comments to the owner/operator regarding the Dust Control Plan. |

Source: San Joaquin Valley Air Pollution Control District 2004

### *Air Quality Management Plan*

As required by the federal CAA and the CCAA, air basins or portions thereof have been classified as either "attainment" or "nonattainment" for each criteria air pollutant, based on if the standards have been achieved. Jurisdictions of nonattainment areas also are required to prepare an air quality management plan that includes strategies for achieving attainment. The SJVAPCD has approved management plans demonstrating how the SJVAB will reach attainment with the federal one-hour and eight-hour ozone and $PM_{2.5}$ standards.

#### OZONE ATTAINMENT PLANS

The *Extreme Ozone Attainment Demonstration Plan*, adopted by the SJVAPCD Governing Board October 8, 2004, sets forth measures and emission-reduction strategies designed to attain the federal one-hour ozone standard by November 15, 2010, as well as an emissions inventory, outreach, and rate of progress demonstration. This plan was approved by the USEPA on March 8, 2010; however, the USEPA's approval was subsequently withdrawn effective November 26, 2012, in response to a decision issued by the U.S. Court of Appeals for the Ninth Circuit (*Sierra Club v. EPA*, 671 F.3d 955) remanding USEPA's approval of these SIP revisions. Concurrent with the USEPA's final rule, CARB withdrew the 2004 Plan. The SJVAPCD developed a new plan for the one-hour ozone standard, the *2013 Plan for the Revoked 1-Hour Ozone Standard*, which it adopted in September 2013.

The *2007 Ozone Plan*, approved by CARB on June 14, 2007, demonstrates how the SJVAB would meet the federal eight-hour ozone standard. The *2007 Ozone Plan* includes a comprehensive list of regulatory and incentive-based measures to reduce emissions of ozone and particulate matter precursors throughout the SJVAB. Additionally, this plan calls for major advancements in pollution control technologies for mobile and stationary sources of air pollution, and an increase in state and federal funding for incentive-based measures to create adequate reductions in emissions to bring the entire SJVAB into attainment with the federal eight-hour ozone standard (SJVAPCD 2007a).

On April 16, 2009, the SJVAPCD Governing Board adopted the *Reasonably Available Control Technology Demonstration for Ozone State Implementation Plans (2009 RACT SIP)* (SJVAPCD 2009a). In part, the *2009 RACT SIP* satisfied the commitment by the SJVAPCD for a new reasonably available control technology analysis for the one-hour ozone plan (see discussion of the USEPA withdrawal of approval in the *Extreme 1-Hour Ozone Attainment Demonstration Plan* summary above) and was intended to prevent all sanctions that could be imposed by USEPA for failure to submit a required SIP revision for the one-hour ozone standard. With respect to the 8-hour standard, the plan also assesses the SJVAPCD's rules based on the adjusted major source definition of 10 tons per year (due to the SJVAB's designation as an extreme subsequently nonattainment area), evaluates SJVAPCD rules against new *Control Techniques Guidelines* promulgated since August 2006, and reviews additional rules and amendments that had been adopted by the Governing Board since August 17, 2006, for reasonably available control technology consistency.

The *2013 Plan for the Revoked 1-Hour Ozone Standard* was approved by the Governing Board on September 19, 2013 (SJVAPCD 2013a). Based on implementation of the ongoing control measures, preliminary modeling indicates that the SJVAB will attain the 1-hour standard before the final attainment year of 2022 and without relying on long-term measures under the federal CAA Section 182(e)(5) (SJVAPCD 2013a).

On June 19, 2014, the Governing Board adopted the *2014 Reasonably Available Control Technology Demonstration for the 8-Hour Ozone State Implementation Plan* (SJVAPCD 2014) that includes a demonstration that the SJVAPCD rules implement RACT. The plan reviews each of the $NO_x$ reduction rules and concludes that they satisfy requirements for stringency, applicability, and enforceability, and meet or exceed RACT. The plan's analysis of further ROG reductions through modeling and technical analyses demonstrates that added ROG reductions will not advance the SJVAB's ozone attainment. Each ROG rule evaluated in the 2009 RACT SIP has been subsequently approved by the USEPA as meeting RACT within the last two years. The subsequent attainment strategy, therefore, focuses on further $NO_X$ reductions.

SJVAPCD adopted the *2020 Reasonably Available Control Technology (RACT) Demonstration for the 2015 8-Hour Ozone Standard* in June 2020. This plan satisfies CAA requirements and ensures expeditious attainment of the 70 parts per billion eight-hour standard (SJVAPCD 2020).

SJVAPCD adopted the *2022 Plan for the 2015 8-Hour Ozone Standard* on December 15, 2022. This plan uses extensive science and research, state of the art air quality modeling, and the best available information in developing a strategy to attain the federal 2015 national ambient air quality standard (NAAQS) for ozone of 70 ppb as expeditiously as practicable. Building on decades of developing and implementing effective air pollution control strategies, this plan demonstrates that the reductions being achieved by the SJVAPCD and CARB strategy (72 percent reduction in $NO_X$ emissions by 2037) ensures expeditious attainment of the 2015 8-hour ozone standard by the 2037 attainment deadline.

SJVAPCD adopted the *2023 Maintenance Plan and Redesignation Request for the Revoked 1-Hour Ozone Standard* on June 15, 2023. This maintenance plan demonstrates SJVAPCD's consistency with all five criteria of Section 107(d)(3)(E) of the CAA to terminate all anti-backsliding provisions for the revoked 1-hour ozone standard, including Section 185 nonattainment fees. This Maintenance Plan also includes a demonstration that would ensure the area remains in attainment of the 1-hour ozone NAAQS through 2036. Therefore, SJVAPCD is requesting to be redesignated to attainment for the 1-hour ozone NAAQS and requesting termination of all anti-backsliding obligations.

#### PARTICULATE MATTER ATTAINMENT PLANS

In June 2007, the SJVAPCD Board adopted the *2007 $PM_{10}$ Maintenance Plan and Request for Redesignation* (SJVAPCD 2007b). This plan demonstrates how $PM_{10}$ attainment in the SJVAB will be maintained in the future. Effective November 12, 2008, USEPA redesignated the SJVAB to attainment for the $PM_{10}$ NAAQS and approved the 2007 $PM_{10}$ Maintenance Plan (USEPA 2008).

In April 2008, the SJVAB Board adopted the *2008 $PM_{2.5}$ Plan* and approved amendments to Chapter 6 of the *2008 $PM_{2.5}$ Plan* on June 17, 2010 (SJVAPCD 2008a). This plan was designed to addresses USEPA's annual $PM_{2.5}$ standard of 15 micrograms per cubic meter (µg/m³), which was established by USEPA in 1997. In December of 2012, the SJVAPCD adopted the *2012 $PM_{2.5}$ Attainment Plan*, which addresses USEPA's 24-hour $PM_{2.5}$ standard of 35 µg/m³, which was established by USEPA in 2006 (SJVAPCD 2012). In April 2015, the SJVAPCD Board adopted the *2015 Plan for the 1997 $PM_{2.5}$ Standard* that addresses the USEPA's annual and 24-hour $PM_{2.5}$ standards established in 1997 after the SJVAB experienced higher $PM_{2.5}$ levels in winter 2013–2014 due to the extreme drought, stagnation, strong inversions, and historically dry conditions, and the SJVAPCD was unable to meet the initial attainment date of December 31, 2015 (SJVAPCD 2015c).

SJVAPCD adopted the *2016 Moderate Area Plan for the 2012 $PM_{2.5}$ Standard* on September 15, 2016. This plan addresses the USEPA federal annual $PM_{2.5}$ standard of 12 µg/m³, established in 2012. This plan includes an attainment impracticability demonstration and request for reclassification of the Valley from Moderate nonattainment to Serious nonattainment (SJVAPCD 2016).

SJVAPCD adopted the *2018 Plan for the 1997, 2006, and 2012 $PM_{2.5}$ Standards* in November 2018. This plan addresses the USEPA federal 1997 annual $PM_{2.5}$ standard of 15 µg/m³ and the 24-hour $PM_{2.5}$

standard of 65 μg/$m^3$; the 2006 24-hour $PM_{2.5}$ standard of 35 μg/$m^3$; and the 2012 annual $PM_{2.5}$ standard of 12 μg/$m^3$. The plan demonstrates attainment of the federal $PM_{2.5}$ standards as expeditiously as practicable as required under the federal CAA (SJVAPCD 2018). The district is currently developing the 2023 Plan for the 2012 Annual $PM_{2.5}$ Standard.

## Local

### *Fresno County*

The Fresno County General Plan was adopted in October 2000. The Open Space Element contains air quality policies to reduce emissions from new developments (County of Fresno 2000). The following policies are applicable to the Project:

- **Policy OS-G.13:** The County shall include fugitive dust control measures as a requirement for subdivision maps, site plans, and grading permits. This will assist in implementing the SJVAPCD's $PM_{10}$ regulation (Regulation VIII). Enforcement actions can be coordinated with the Air District's Compliance Division.
- **Policy OS-G.14.** The County shall require all access roads, driveways, and parking areas serving new commercial and industrial development to be constructed with materials that minimize particulate emissions and are appropriate to the scale and intensity of use.

## Existing Ambient Air Quality

The SJVAPCD operates 10 air quality monitoring station in the SJVAB within Fresno County. The purpose of the monitoring stations is to measure ambient concentrations of pollutants and determine whether ambient air quality meets the California and federal standards. The nearest monitoring station is the Tranquility-32650 West Adams Avenue monitoring station, located at 32650 West Adams Avenue in Fresno, approximately 13 miles north of the Project site. This monitoring station measures only ozone and $PM_{2.5}$. For $PM_{10}$ and $NO_2$; therefore, additional data from the Fresno-Drummond Street monitoring station was used, which is located at 4706 East Drummond Street in Fresno, approximately 38 miles northeast of the Project site. In addition, data from the Fresno-Garland monitoring station, approximately 30-miles northeast of the Project site, is provided. Because monitoring is not generally conducted for pollutants for which the SJVAB is in attainment, there is no recent monitoring data available for CO or $SO_2$.

Table 4 indicates the number of days that each of the federal and state standards has been exceeded at monitoring stations near the Project site in each of the last three years for which data is available. The federal and State 8-hour ozone standards were exceeded in 2020 and 2021 at the Tranquility monitoring station. The federal and State 8-hour ozone standards were exceeded at the Fresno-Drummond and Fresno-Garland monitoring stations. Additionally, the $PM_{10}$ state standards were exceeded all 3 years at all three monitoring stations. The federal $PM_{10}$ standards were exceeded in 2020 at all three monitoring stations, and 2021 at the Fresno-Garland monitoring stations. The $PM_{2.5}$ federal standards were exceeded in 2020 and 2021 at the Tranquility monitoring station at in 2020, 2021, and 2022 at the Fresno-Garland monitoring station. No other federal or state standards were exceeded at this monitoring station.

## Table 4 Ambient Air Quality at the Monitoring Station

| Pollutant | 2020 | 2021 | 2022 |
|---|---|---|---|
| **Tranquility 32650 West Adams Avenue Monitoring Station** | | | |
| **Ozone** | | | |
| 8 Hour Ozone (ppm), 8-Hr Maximum | 0.079 | 0.080 | 0.066 |
| Number of Days of State exceedances (>0.070) | 3 | 6 | 0 |
| Number of days of Federal exceedances (>0.070) | 3 | 5 | 0 |
| Ozone (ppm), Worst Hour | 0.087 | 0.088 | 0.074 |
| Number of days above State standard (>0.09 ppm) | 0 | 0 | 0 |
| **Respirable Particulate Matter, $PM_{10}$** | | | |
| Particulate Matter 10 microns, $\mu g/m^3$, Worst 24 Hours | -- | -- | -- |
| Number of days above State standard (>50 $\mu g/m^3$) | -- | -- | -- |
| Number of days above Federal standard (>150 $\mu g/m^3$) | -- | -- | -- |
| **Fine Particulate Matter, $PM_{2.5}$** | | | |
| Particulate Matter <2.5 microns, $\mu g/m^3$, Worst 24 Hours | 146.2 | 65.3 | 33.1 |
| Number of days above Federal standard (>35 $\mu g/m^3$) | 21 | 7 | 0 |
| **Nitrogen Dioxide, $NO_2$** | | | |
| Nitrogen Dioxide (ppb), Worst Hour | 66.8 | 64.5 | 58.3 |
| Number of days above State standard (>180 ppb) | 0 | 0 | 0 |
| Number of days above Federal standard (>100 ppb) | 0 | 0 | 0 |
| **Fresno-Drummond Street Monitoring Station** | | | |
| **Ozone** | | | |
| 8 Hour Ozone (ppm), 8-Hr Maximum | 0.091 | 0.099 | 0.089 |
| Number of Days of State exceedances (>0.070) | 27 | 41 | 8 |
| Number of days of Federal exceedances (>0.070) | 27 | 39 | 8 |
| Ozone (ppm), Worst Hour | 0.123 | 0.125 | 0.111 |
| Number of days above State standard (>0.09 ppm) | 11 | 9 | 3 |
| **Respirable Particulate Matter, $PM_{10}$** | | | |
| Particulate Matter 10 microns, $\mu g/m^3$, Worst 24 Hours | 350.4 | 151.8 | 73.4 |
| Number of days above State standard (>50 $\mu g/m^3$) | 25 | 20 | 133 |
| Number of days above Federal standard (>150 $\mu g/m^3$) | 1 | 0 | 0 |
| **Fine Particulate Matter, $PM_{2.5}$**[1] | | | |
| Particulate Matter <2.5 microns, $\mu g/m^3$, Worst 24 Hours | -- | -- | -- |
| Number of days above Federal standard (>35 $\mu g/m^3$) | -- | -- | -- |
| **Nitrogen Dioxide, $NO_2$** | | | |
| Nitrogen Dioxide (ppb), Worst Hour | 66.8 | 64.5 | 58.3 |
| Number of days above State standard (>180 ppb) | 0 | 0 | 0 |

| Pollutant | 2020 | 2021 | 2022 |
|---|---|---|---|
| Number of days above Federal standard (>100 ppb) | 0 | 0 | 0 |
| **Fresno-Garland Monitoring Station** | | | |
| **Ozone** | | | |
| 8 Hour Ozone (ppm), 8-Hr Maximum | 0.099 | 0.093 | 0.083 |
| Number of Days of State exceedances (>0.070) | 24 | 22 | 10 |
| Number of days of Federal exceedances (>0.070) | 24 | 18 | 10 |
| Ozone (ppm), Worst Hour | 0.119 | 0.112 | 0.096 |
| Number of days above State standard (>0.09 ppm) | 10 | 6 | 2 |
| **Respirable Particulate Matter, $PM_{10}$** | | | |
| Particulate Matter 10 microns, μg/m$^3$, Worst 24 Hours | 296.4 | 281.0 | 116.1 |
| Number of days above State standard (>50 μg/m$^3$) | 99 | 91 | 73 |
| Number of days above Federal standard (>150 μg/m$^3$) | 14 | 1 | 0 |
| **Fine Particulate Matter, $PM_{2.5}$** | | | |
| Particulate Matter <2.5 microns, μg/m$^3$, Worst 24 Hours | 163.2 | 99.9 | 53.3 |
| Number of days above Federal standard (>35 μg/m$^3$) | 62 | 58 | 61 |
| **Nitrogen Dioxide, $NO_2$** | | | |
| Nitrogen Dioxide (ppb), Worst Hour | 47.5 | 56.3 | 54.7 |
| Number of days above State standard (>180 ppb) | 0 | 0 | 0 |
| Number of days above Federal standard (>100 ppb) | 0 | 0 | 0 |

μg/m$^3$ = micrograms per cubic meter; ppb = parts per billion

[1] Air quality data for $PM_{2.5}$ is unavailable from the Fresno-Drummond Monitoring Station.

Source: California Air Resources Board 2023

## 2.2.2 Greenhouse Gases

### Federal Regulations

#### *Federal Clean Air Act*

The U.S. Supreme Court determined in *Massachusetts et al. v. Environmental Protection Agency et al.* ([2007] 549 U.S. 05-1120) that the USEPA has the authority to regulate motor vehicle GHG emissions under the federal CAA. The USEPA issued a Final Rule for mandatory reporting of GHG emissions in October 2009. This Final Rule applies to fossil fuel suppliers, industrial gas suppliers, direct GHG emitters, and manufacturers of heavy-duty and off-road vehicles and vehicle engines and requires annual reporting of emissions. In 2012, the USEPA issued a Final Rule that established the GHG permitting thresholds that determine when CAA permits under the New Source Review Prevention of Significant Deterioration and Title V Operating Permit programs are required for new and existing industrial facilities.

In *Utility Air Regulatory Group v. Environmental Protection Agency* (134 Supreme Court 2427 [2014]), the U.S. Supreme Court held the USEPA may not treat GHGs as an air pollutant for purposes of determining whether a source can be considered a major source required to obtain a Prevention of

Significant Deterioration or Title V permit. The Court also held that Prevention of Significant Deterioration permits otherwise required based on emissions of other pollutants may continue to require limitations on GHG emissions based on the application of Best Available Control Technology.

### *Final Rule to Revise Existing National GHG Emissions Standards for Passenger Cars and Light Trucks Through Model Year 2026.*

The USEPA finalized the federal GHG emissions standards for passenger cars and light trucks for model years 2023 through 2026 in February 2022. These standards will leverage current and future technologies to result in the avoidance of more than 3 billion tons of GHGs through 2050.

## State Regulations

CARB is responsible for the coordination and oversight of state and local air pollution control programs in California. There are numerous regulations aimed at reducing the state's GHG emissions. These initiatives are summarized below.

### *California Advanced Clean Cars Program*

Assembly Bill (AB) 1493 (2002), California's Advanced Clean Cars program (referred to as "Pavley"), requires CARB to develop and adopt regulations to achieve "the maximum feasible and cost-effective reduction of GHG emissions from motor vehicles." On June 30, 2009, the USEPA granted the waiver of CAA preemption to California for its GHG emission standards for motor vehicles, beginning with the 2009 model year, which allows California to implement more stringent vehicle emission standards than those promulgated by the USEPA. Pavley I regulates model years from 2009 to 2016 and Pavley II, now referred to as "LEV (Low Emission Vehicle) III GHG," regulates model years from 2017 to 2025. The Advanced Clean Cars program coordinates the goals of the LEV, Zero Emissions Vehicles (ZEV), and Clean Fuels Outlet programs and would provide major reductions in GHG emissions. By 2025, the rules will be fully implemented, and new automobiles will emit 34 percent fewer GHGs and 75 percent fewer smog-forming emissions from their model year 2016 levels (CARB 2011).

### *Assembly Bill 1007 (State Alternative Fuels Plan)*

AB 1007 (Chapter 371, Statutes of 2005) required the CEC to prepare a state plan to increase the use of alternative fuels in California. The CEC prepared the State Alternative Fuels Plan (SAF Plan) in partnership with CARB and in consultation with other federal, State, and local agencies. The SAF Plan presents strategies and actions California must take to increase the use of alternative non-petroleum fuels in a manner that minimizes costs to California and maximizes the economic benefits of in-state production. The SAF Plan assessed various alternative fuels and developed fuel portfolios to meet California's goals to reduce petroleum consumption, increase alternative fuels use, reduce GHG emissions, and increase in-State production of biofuels without causing a significant degradation of public health and environmental quality. The SAF Plan provided a framework for subsequent legislation, including AB 118 (Chapter 750, Statutes of 2007), to be passed, which currently provides 690 million dollars in funding for medium- and heavy-duty battery-electric and hydrogen infrastructure, and 77 million dollars for hydrogen refueling infrastructure (CARB 2007, CEC 2021b).

### *California Global Warming Solutions Act of 2006 (Assembly Bill 32 and Senate Bill 32)*

The "California Global Warming Solutions Act of 2006," (AB 32), outlines California's major legislative initiative for reducing GHG emissions. AB 32 codifies the statewide goal of reducing GHG emissions to 1990 levels by 2020 and requires CARB to prepare a Scoping Plan that outlines the main state strategies for reducing GHG emissions to meet the 2020 deadline. In addition, AB 32 requires CARB to adopt regulations to require reporting and verification of statewide GHG emissions. Based on this guidance, CARB approved a 1990 statewide GHG level and 2020 target of 431 MMT of $CO_2e$, which was achieved in 2016. CARB approved the Scoping Plan on December 11, 2008, which included GHG emission reduction strategies related to energy efficiency, water use, and recycling and solid waste, among others (CARB 2008). Many of the GHG reduction measures included in the Scoping Plan (e.g., Low Carbon Fuel Standard, Advanced Clean Car standards, and Cap-and-Trade) have been adopted since the Scoping Plan's approval.

The CARB approved the 2013 Scoping Plan update in May 2014. The update defined the CARB's climate change priorities for the next five years, set the groundwork to reach post-2020 statewide goals, and highlighted California's progress toward meeting the "near-term" 2020 GHG emission reduction goals defined in the original Scoping Plan. It also evaluated how to align the state's longer term GHG reduction strategies with other state policy priorities, including those for water, waste, natural resources, clean energy, transportation, and land use (CARB 2014).

On September 8, 2016, the governor signed Senate Bill (SB) 32 into law, extending the California Global Warming Solutions Act of 2006 by requiring the state to further reduce GHG emissions to 40 percent below 1990 levels by 2030 (the other provisions of AB 32 remain unchanged). On December 14, 2017, the CARB adopted the 2017 Scoping Plan, which provides a framework for achieving the 2030 target. The 2017 Scoping Plan relies on the continuation and expansion of existing policies and regulations, such as the Cap-and-Trade Program, and implementation of recently adopted policies and legislation, such as SB 1383 and SB 100. The 2017 Scoping Plan also puts an increased emphasis on innovation, adoption of existing technology, and strategic investment to support its strategies. As with the 2013 Scoping Plan update, the 2017 Scoping Plan does not provide project-level thresholds for land use development. Instead, it recommends that local governments adopt policies and locally appropriate quantitative thresholds consistent with statewide per capita goals of 6 MT of $CO_2e$ by 2030 and 2 MT of $CO_2e$ by 2050 (CARB 2017). As stated in the 2017 Scoping Plan, these goals may be appropriate for plan-level analyses (city, county, sub-regional, or regional level), but not for specific individual projects because they include all emissions sectors in the state.

CARB published the Final 2022 Scoping Plan for Achieving Carbon Neutrality (2022 Scoping Plan Update) in November 2022, as the third update to the initial plan that was adopted in 2008. The 2022 Scoping Plan Update is the most comprehensive and far-reaching Scoping Plan developed to date. It identifies a technologically feasible, cost-effective, and equity-focused path to achieve new targets for carbon neutrality by 2045 and to reduce anthropogenic GHG emissions to at least 85 percent below 1990 levels, while also assessing the progress California is making toward reducing its GHG emissions by at least 40 percent below 1990 levels by 2030, as called for in SB 32 and laid out in the 2017 Scoping Plan (CARB 2022c). The 2030 target is an interim but important stepping-stone along the critical path to the broader goal of deep decarbonization by 2045. The relatively longer path assessed in the 2022 Scoping Plan Update incorporates, coordinates, and leverages many existing and ongoing efforts to reduce GHGs and air pollution, while identifying new clean technologies and energy. Given the focus on carbon neutrality, the 2022 Scoping Plan Update also includes discussion for the first time of the natural and working lands sectors as sources for both sequestration and carbon storage, and as sources of emissions as a result of wildfires.

The 2022 Scoping Plan Update reflects existing and recent direction in the Governor's Executive Orders and State Statutes, which identify policies, strategies, and regulations in support of and implementation of the Scoping Plan. Among these include Executive Order B-55-18 and AB 1279 (the California Climate

Crisis Act), which identify the carbon neutrality and GHG reduction targets for 2045 incorporated into the Scoping Plan.

### *Senate Bill 375*

The Sustainable Communities and Climate Protection Act of 2008 (SB 375), signed in August 2008, enhances the state's ability to reach AB 32 goals by directing CARB to develop regional GHG emission reduction targets to be achieved from passenger vehicles by 2020 and 2035. SB 375 aligns regional transportation planning efforts, regional GHG reduction targets, and affordable housing allocations. Metropolitan Planning Organizations (MPO) are required to adopt a Sustainable Communities Strategy (SCS), which allocates land uses in the MPO's Regional Transportation Plan (RTP). Qualified projects consistent with an approved SCS or Alternative Planning Strategy (categorized as "transit priority projects") can receive incentives to streamline CEQA processing.

On March 22, 2018, CARB adopted updated regional targets for reducing GHG emissions from 2005 levels by 2020 and 2035. The Fresno Council of Governments (FCOG) was assigned targets of a 6 percent reduction in per capita GHG emissions from passenger vehicles by 2020 and a 13 percent reduction in per capita GHG emissions from passenger vehicles by 2035 (CARB 2018a). The FCOG is the regional planning agency for Fresno County and serves as a forum for regional issues relating to transportation, the economy, community development, and the environment. FCOG most recently prepared the *2018 Regional Transportation Plan and Sustainable Communities Strategy* (2018 RTP/SCS) for the region. The plan quantified a 5 percent reduction by 2020 and a 10 percent reduction by 2035 (FCOG 2018). In 2018, CARB accepted FCOG's quantification of GHG reductions and its determination the SCS, if implemented, would achieve FCOG targets. Project consistency with the 2018 RTP/SCS would therefore support AB 32 and SB 32 GHG reduction goals.

The 2022 RTP/SCS (2022 RTP) was approved by the Fresno COG on July 28, 2022. The 2022 RTP/SCS comprehensively assess all forms of transportation available in Fresno County as well as travel and goods movement needed through 2046. Implementation of the goals set forth in the 2022 RTP will help achieve the state health standards and climate goals associated with transportation impacts.

### *Senate Bill 1383*

Adopted in September 2016, SB 1383 (Lara, Chapter 395, Statutes of 2016) requires CARB to approve and begin implementing a comprehensive strategy to reduce emissions of short-lived climate pollutants. SB 1383 requires the strategy to achieve the following reduction targets by 2030:

- Methane – 40 percent below 2013 levels
- Hydrofluorocarbons – 40 percent below 2013 levels
- Anthropogenic black carbon – 50 percent below 2013 levels

SB 1383 also requires the California Department of Resources Recycling and Recovery (CalRecycle), in consultation with CARB, to adopt regulations that achieve specified targets for reducing organic waste in landfills.

### *Senate Bill 100*

Adopted on September 10, 2018, SB 100 supports the reduction of GHG emissions from the electricity sector by accelerating the state's Renewables Portfolio Standard (RPS) Program, which was last updated by SB 350 in 2015. SB 100 requires electricity providers to increase procurement from eligible renewable energy resources to 33 percent of total retail sales by 2020, 60 percent by 2030, and 100 percent by 2045.

### *Executive Order B-55-18*

On September 10, 2018, former Governor Brown issued Executive Order B-55-18, which established a new statewide goal of achieving carbon neutrality by 2045 and maintaining net negative emissions thereafter. This goal is in addition to the existing statewide GHG reduction targets established by SB 375, SB 32, SB 1383, and SB 100.

### *17 California Code of Regulations Section 95350 et seq.*

In 2010, CARB adopted the *Regulation for Reducing Sulfur Hexafluoride Emissions From Gas Insulated Switchgear* (Section 17 CCR Section 95350 et seq.). The purpose of this regulation is to achieve GHG emission reductions by reducing $SF_6$ emissions from gas-insulated switchgear. Owners of such switchgear must not exceed maximum allowable annual emissions rates, reduced each year until 2020, after which annual emissions must not exceed 1 percent. Owners must regularly inventory gas-insulated switchgear equipment, measure quantities of $SF_6$, and maintain records of these for at least three years. Additionally, by June 1 each year, owners also must submit an annual report to CARB's Executive Officer for emissions that occurred during the previous calendar year.

In December 2021, CARB adopted amendments to the Regulation for Reducing Sulfur Hexafluoride Emissions from Gas Insulated Switchgear, to update the phase out of $SF_6$ in gas-insulated switchgear. The new phase out schedule begins in January 2025 with all switchgear needing to be $SF_6$ free by January 2033. Under this resolution, CARB has developed a timeline for phasing out $SF_6$ equipment in California and created incentives to encourage owners to replace $SF_6$ equipment. The California Office of Administrative Law approved this rulemaking in December 2021 and the Resolution went into effect January 1, 2022.

### *California Advanced Clean Trucks Program*

In March 2021, CARB approved the Advanced Clean Trucks regulation, which requires manufacturers who certify Class 2b-8 chassis or complete vehicles with combustion engines to sell zero-emission trucks as an increasing percentage of their annual California sales from 2024 to 2035. In addition, the regulation requires company and fleet reporting for large employers and fleet owners with 50 or more trucks. By 2045, all new trucks sold in California must be zero-emission. Implementation of this regulation would reduce consumption of nonrenewable transportation fuels as trucks transition to alternative fuel sources.

### *California Advanced Clean Fleets Regulation*

In April 2023, CARB approved the Advanced Clean Fleets (ACF) regulation. The ACF regulation is part of California's strategy to accelerate the adoption of medium- and heavy-duty zero-emission vehicles (ZEV). It complements the Advanced Clean Trucks ACT regulation and aims to achieve public health, air quality, and climate goals. The ACF regulation applies to fleets performing drayage operations, those owned by State, local, and federal government agencies, and high priority fleets. The ACF regulation includes components such as a manufacturer sales mandate, drayage fleet registrations, requirements for drayage fleets to transition to zero-emission vehicles, and mandates for high priority and government fleets to purchase increasing percentages of ZEVs over time. The regulation provides flexibility and exemptions for cases where zero-emission trucks are not yet available. The ACF regulation is expected to significantly increase the number of ZEVs on California roads, leading to emissions reductions and health benefits. The Advanced Clean Trucks and ACF regulations together are expected to result in about 510,000, 1,350,000 and 1,690,000 ZEVs in California in 2035, 2045, and 2050, respectively.

### *Executive Order B-48-18 (Zero-Emission Vehicles)*

On January 26, 2018, Governor Brown signed Executive Order B-48-18 requiring all State entities to work with the private sector to have at least 5 million ZEVs on the road by 2030, as well as install 200 hydrogen fueling stations and 250,000 electric vehicle (EV) charging stations by 2025. It specifies that 10,000 of the EV charging stations should be direct current fast chargers. This order also requires all State entities to continue to partner with local and regional governments to streamline the installation of ZEV infrastructure. The Governor's Office of Business and Economic Development is required to publish a Plug-in Charging Station Design Guidebook and update the 2015 Hydrogen Station Permitting Guidebook to aid in these efforts. All State entities are required to participate in updating the 2016 Zero-Emissions Vehicle Action Plan, along with the 2018 ZEV Action Plan Priorities Update, which includes and extends the 2016 ZEV Action Plan (Governor's Interagency Working Group on Zero-Emission Vehicles 2016, 2018), to help expand private investment in ZEV infrastructure with a focus on serving low-income and disadvantaged communities.

### *Executive Order N-79-20 (Zero Emissions Vehicles Sales)*

Governor Gavin Newsom signed Executive Order N-79-20 in September 2020, which sets a statewide goal that 100 percent of all new passenger car and truck sales in the state will be zero-emissions by 2035. It also sets a goal that 100 percent of statewide new sales of medium- and heavy-duty vehicles will be zero emissions by 2045, where feasible, and for all new sales of drayage trucks to be zero emissions by 2035. Additionally, the Executive Order targets 100 percent of new off-road vehicle sales in the state to be zero emission by 2035. CARB is responsible for implementing the new vehicle sales regulation.

### *Senate Bill 1020*

SB 1020 signed into law on September 16, 2022, requires renewable energy and zero-carbon resources to supply 90 percent of all retail electricity sales by 2035, 95 percent by 2040, and 100 percent by 2045. All State agencies facilities must be served by 100 percent renewable and zero-carbon resources by 2030. SB 1020 also requires the California Public Utilities Commission, CEC, and CARB to issue a joint progress report outlining the reliability of the electrical grid with a focus on summer reliability and challenges and gaps. Additionally, SB 1020 requires the California Public Utilities Commission to define energy affordability and use energy affordability metrics to develop protections, incentives, discounts, or new programs for residential customers facing hardships due to energy or gas bills.

## Local Regulations

### *Fresno Council of Governments*

As discussed above, the FCOG developed the 2022 RTP/SCS as the region's strategy to fulfill the requirements of SB 375. The 2022 RTP/SCS establishes a development pattern for the region that, when integrated with the transportation network and other policies and measures, would reduce GHG emissions from transportation (excluding goods movement). Specifically, the 2020 RTP/SCS is a financially feasible plan that achieves health standards for clean air and addresses climate goals set by the state. The 2022 RTP/SCS does not require local general plans, specific plans, or zoning be consistent with it but provides incentives for consistency for governments and developers. As discussed above under SB 375, FCOG the 2022-2045 RTP for was approved on July 28, 2022.

### San Joaquin Valley Air Pollution Control District

In August 2008, the SJVAPCD's Governing Board adopted the *Climate Change Action Plan* (SJVAPCD 2008b). The *Climate Change Action Plan* directed the SJVAPCD Air Pollution Control Officer to develop guidance to assist lead agencies, project proponents, permit applicants, and interested parties in assessing and reducing the impacts of project-specific GHG emissions on global climate change.

In 2009, the SJVAPCD adopted the *Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects Under CEQA* and the *District Policy – Addressing GHG Emission Impacts for Stationary Source Projects Under CEQA When Serving as the Lead Agency*. The guidance and policy rely on the use of performance-based standards, otherwise known as Best Performance Standards (BPS), to assess significance of project-specific GHG emissions on global climate change during the environmental review process, as required by CEQA (SJVAPCD 2009b; 2009c).

Use of BPS was a method for CEQA streamlining, but they were not required measures. Projects implementing BPS could be determined to have a less than cumulatively significant GHG impact. Another option was to demonstrate a 29 percent reduction in GHG emissions from business-as-usual (BAU) conditions to determine that a project would have a less than cumulatively significant impact and be consistent with AB 32 2020 targets. The guidance does not limit a lead agency's authority in establishing its own thresholds for determining the significance of project-related GHG impacts (SJVAPCD 2009c). Since SJVAPCD's recommended BPS method and 29 percent below BAU method were designed with 2020 GHG reduction targets in mind, compliance with these BPS or demonstration of 29 percent below BAU are no longer applicable to determining the significance of GHG impacts for projects developed after 2020.

### Fresno County General Plan

There are no specific policies related to GHG emissions or climate change in the Fresno County 2000 General Plan. The General Plan includes energy efficiency goals and policies applicable to new and existing housing. These would not apply to the Project.

# 3 Methodology and Significance Criteria

This section presents the methodology and significance criteria used for the analysis of construction, operational, and decommissioning emissions for the Project. Criteria pollutant and GHG emissions for Project construction and operation were calculated using the California Emissions Estimator Model (CalEEMod), Version 2022.1.1.19. CalEEMod is a statewide land use emissions computer model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify potential criteria pollutant and GHG emissions associated with both construction and operations from a variety of land use projects. CalEEMod allows for the use of default data (e.g., emission factors, trip lengths, meteorology, source inventory) provided by the various California air districts to account for local requirements and conditions, and/or user-defined inputs. The calculation methodology and input data used in CalEEMod can be found in the CalEEMod User's Guide Appendices A, D, and E (California Air Pollution Control Officers Association 2022). The input data and construction and operation emission estimates for the Project are discussed below and provided in Appendix N-1. Emissions calculations made outside CalEEMod, such as determination of emissions for helicopter usage, utility task vehicles (UTV) usage, determination of $SF_6$ consumption, and the compiled emissions profiles are included in Appendix N-2. CalEEMod output files for the Project are included in Appendix N-3. The estimated emissions were then compared to applicable significance criteria.

## 3.1 Methodology

### Construction Emissions

Construction emissions of criteria air pollutants and GHG include emissions generated by construction equipment used on-site and emissions generated by vehicle trips associated with construction, such as worker and vendor trips. CalEEMod estimates construction emissions by multiplying the amount of time equipment is in operation by emission factors.

As there are two possible construction scenarios, an 18-month construction scenario and a 36-month construction scenario were modeled. Emissions were analyzed for both scenarios to account for the differences in construction equipment and the duration of construction phasing. Construction of the Project was modeled based on the Applicant-provided construction schedule for each scenario. ~~The analysis accounted for the worst-case construction scenario between component location Options 1, and 2, and the alternate green hydrogen site.~~

Construction equipment was estimated to operate 8 hours per day and used horsepower information provided by the Applicant and the CalEEMod defaults for load factor. Vendor and haul trips were modeled as exclusively heavy heavy-duty truck trips. The analysis conservatively assumes a one-way distance of 160 miles to account for sourcing materials from California ports within the air basin for the air quality analysis; or up to 251 miles from the main site to California ports to inform the GHG analysis. Soils excavated during construction are assumed to be balanced on-site. This analysis assumes that the Project would comply with all applicable regulatory standards. In particular, the Project would comply with SJVACPD Rule 8021. Rule 8021 control measures for construction, demolition, excavation, extraction, and other earthmoving activities were included in the model with the assumption that watering would occur twice a day and the vehicle speed on unpaved roads onsite would be 15 miles per hour.

Detailed assumptions including schedule and phasing for each construction scenario is included in Appendix N-1. Table 5 below includes the anticipated construction phases and dates for each of the construction scenarios. Phase 6, Green Hydrogen Facility, has been removed from the Project but not from modeled results; therefore, overall emissions and emissions presented in this analysis are inclusive of the green hydrogen facility and considered conservative.

**Table 5 Construction Schedules**

| | 18-Month Scenario | | | 36-Month Scenario | | |
|---|---|---|---|---|---|---|
| Phase | Start | End | Days | Start | End | days |
| Solar Facility, Substation and Gen-Tie | | | | | | |
| Phase 1: Site Preparation | 12/31/2025 | 4/30/2026 | 90 | 12/31/2025 | 7/31/2026 | 140 |
| Phase 2: PV Panel System | 2/28/2026 | 6/28/2027 | 320 | 5/31/2026 | 6/30/2028 | 500 |
| Phase 3: Inverters, Transformers, Substation, and Electrical | 5/28/2026 | 3/28/2027 | 200 | 5/30/2027 | 5/30/2028 | 240 |
| Phase 4: Gen-Tie | 1/30/2026 | 6/30/2026 | 100 | 11/30/2027 | 5/30/2028 | 120 |
| BESS Facility (Phase 5) | 10/28/2026 | 4/28/2027 | 120 | 1/30/2028 | 9/30/2028 | 160 |
| ~~Green Hydrogen Facility (Phase 6)~~ | ~~9/28/2026~~ | ~~4/28/2027~~ | ~~140~~ | ~~2/29/2028~~ | ~~12/29/2028~~ | ~~200~~ |
| Utility Switchyard (Phase 7) | 2/28/2026 | 11/28/2026 | 180 | 5/31/2026 | 3/31/2027 | 200 |

## Operational Emissions

In CalEEMod, operational sources of criteria pollutant and GHG emissions include area, energy, and mobile sources. The first year of operation was assumed to be 2027 based on the potential for an 18-month construction schedule. The facilities were modeled as refrigerated warehouses of 3,946,800 square feet to account for the energy requirements for maintaining a stable temperature for optimum battery effectiveness, although this energy consumption is anticipated to be offset by the power generated at the site. The 10,400 square foot O&M building proposed for the solar facility was modeled as an office, ~~and the additional O&M building that would be required if the green hydrogen facility is built at the alternative site located west of I-5 was modeled as a separate 8,000-square-foot office building[4].~~ It is anticipated that the majority of the facilities would be solar powered using the power generated at the facility itself~~, except for some of the power needed for the green hydrogen facility~~.

CalEEMod defaults were used to estimate emissions from annual architectural coating and consumer products use for the O&M buildings. ~~The majority of the operation of the green hydrogen facility is anticipated to be offset by the solar electrical generation on-site, with an additional 1,515,480 MWh drawn annually from the grid. In addition, the green hydrogen facility would have twelve approximately 670.5-horse-power, emergency, back-up generators.~~

Water will be pumped from on-site wells and treated on-site for use. The energy associated with pumping and treating water is incorporated in the electrical demand for the facilities and is therefore not quantified separately.

~~[4] This analysis originally anticipated the O&M building would be 160,000 square foot, which is included in the modeling. This results in conservative ROG emissions as the ROG emissions for architectural coating are based on building size and not project-specific information. Therefore, it is anticipated that ROG emissions would be less than what is analyzed in this report.~~

Solid waste generation was based on CalEEMod defaults for the two O&M buildings.[5] ~~The green hydrogen electrolyzer would generate approximately 8 cubic feet of solid waste per day, which would be stored on-site and result in approximately six trips per year to the Kettleman Landfill, which is approximately 47 miles from the Project site. This was modeled as a daily haul truck trip in CalEEMod, instead of as waste generation.~~ Diesel or gasoline-fueled on-site equipment, workers, worker trips, and haul trips associated with each of the operational activities are included in Table 6. Operational activities are anticipated to occur 10 hours per day. CEC Appendix B Item (E) GHG requires "The emission rates of criteria pollutants and greenhouse gases ($CO_2$, $CH_4$, $N_2O$, and SF6) from the stack, cooling towers, fuels and materials handling processes, delivery and storage systems, and from all on-site secondary emission sources." The project does not include stacks, cooling towers, fuels and materials handling processes or delivery and storage systems. The onsite emissions sources are from the on-site use of off-road construction equipment, helicopters, UTVs, fugitive emissions of $SF_6$ from circuit breakers, as well as building operations and employee vehicle trips. Emissions factors for helicopters, UTVs and $SF_6$ consumption are included in Appendix N-2. Emission factors for off-road construction equipment, building emissions, and employee vehicle commutes are imbedded in the CalEEMod model.

### Table 6 Daily Operational Equipment Usage, Workers, and Vehicle Trips

| Phase | Daily Count[1] | Horsepower | Load factor |
|---|---|---|---|
| **Road and Fence Repair** | | | |
| Skid Steer Loaders | 1 | 65 | 0.37 |
| Forklifts | 1 | 89 | 0.2 |
| Off-Highway Trucks | 1 | 376 | 0.38 |
| Workers | 5 | N/A | N/A |
| Worker Trips | 10 | N/A | N/A |
| **Road Reconditioning** | | | |
| Graders | 1 | 187 | 0.41 |
| Scrapers | 1 | 423 | 0.48 |
| Tractors/Loaders/Backhoes | 2 | 97 | 0.37 |
| Pavers | 1 | 81 | 0.42 |
| Rollers | 1 | 80 | 0.38 |
| Off-Highway Trucks | 3 | 500 | 0.38 |
| Workers | 5 | N/A | N/A |
| Worker Trips | 10 | N/A | N/A |
| **Solar Panel Washing** | | | |
| Tractors/Loaders/Backhoes | 1 | 84 | 0.37 |
| Off-Highway Trucks | 1 | 500 | 0.38 |

[5] This analysis originally anticipated the O&M building would be 160,000 square foot, which is included in the modeling. This results in conservative solid waste haul trip and area source-related emission calculations, as these emissions are based on building size and not project-specific information. Therefore, it is anticipated that emissions from these sources would be less than what is analyzed in this report.

| Phase | Daily Count[1] | Horsepower | Load factor |
|---|---|---|---|
| Workers | 17 | N/A | N/A |
| Worker Trips | 42.5 | N/A | N/A |
| **General Maintenance** | | | |
| Workers | 16 | N/A | N/A |
| Worker Trips | 40 | N/A | N/A |
| **Vegetation and Pest Management** | | | |
| Tractor | 12 | 84 | 0.37 |
| Workers | 12 | N/A | N/A |
| Worker Trips | 30 | N/A | N/A |
| ~~**Green Hydrogen Facility**~~ | | | |
| ~~Emergency Generators~~ | ~~12~~ | ~~670.5~~ | ~~0.74~~ |
| ~~Workers~~ | ~~24~~ | ~~0~~ | ~~0~~ |
| ~~Worker Trip~~ | ~~60~~ | ~~N/A~~ | ~~N/A~~ |
| ~~Electrolyzer Solid Waste~~ | ~~1~~ | ~~N/A~~ | ~~N/A~~ |

1. The daily count shown is the number of equipment, workers or worker trips by phase

### *$SF_6$ Emissions*

The project would include 500-kV circuit breakers that contain $SF_6$. New circuit breaker designs have been developed over the past several years to minimize the potential for leakage(CARB 2018b). In addition, the equipment would comply with CARB's *Reducing Sulfur Hexafluoride Emissions from Gas Insulated Switchgear* regulations. CARB's current regulations require that switchgear not exceed a maximum allowable annual $SF_6$ emissions rate (leakage rate) of 1 percent. The only equipment within the substations and switchyards that would have $SF_6$ gas would be the up-to-26 500-kV circuit breakers. The utility switchyard would require five circuit breakers; the step-up substation would require nine~~; the alternate green hydrogen switchyard would require three; and the alternate green hydrogen substation would require nine~~. Each breaker would contain up to 1,500 pounds (lbs) of $SF_6$, for a total of up to ~~39~~21,000 lbs of $SF_6$ gas.

## Methodology for Determining Health Risks

Health impacts associated with TACs are generally from long-term exposure. Typical sources of TACs include industrial processes such as petroleum refining operations, commercial operations such as gasoline stations and dry cleaners, and diesel exhaust. Health impacts from TAC emissions during the operational phase of the Project could result from the use of on-site diesel equipment during Project operation. In addition, the use of large-scale off-road diesel equipment during Project construction may result in a short-term increase of TAC emissions. DPM would be the TAC emitted in the largest quantity during construction and is the primary contaminant of concern for the Project. Thus, health risks were assessed as they relate to DPM exposure.

The significance of health risk impacts is based on the number of excess health risk relative to an established threshold. Health effects from carcinogenic air toxins usually are described in terms of cancer risk. Non-carcinogenic hazards include chronic and acute effects. Acute effects are due to short-term exposure, while chronic effects are due to long-term exposure to a substance. For chronic and acute risks, the hazard index is calculated as the summation of the hazard quotients for all chemicals to which an individual would be exposed. CEC defines acute and chronic exposure as follows (Title 20 CCR Section 1704, Appendix B):

- An acute exposure is one which occurs over a time period of less than or equal to 1 hour.
- A chronic exposure is one which is greater than 12 percent of a lifetime of 70 years.

Average concentrations of DPM at the highest exposed existing sensitive receptors were used to estimate potential chronic and carcinogenic health risk. The health risk calculations were based on the standardized equations contained in the current Air Toxics Hot Spots Program Risk Assessment Guidelines (Office of Environmental Health Hazard Assessment [OEHHA] 2015) and guidelines from the SJVAPCD *Update to District's Risk Management Policy to Address OEHHA's Revised Risk Assessment Guidance Document Final Staff Report* (SJVAPCD 2015d). Toxicity values for the pollutants of concern were acquired from the OEHHA *Air Toxics Hot Spots Program Risk Assessment Guidelines and Inhalation RELs*[6] (OEHHA 2015). OEHHA provides chronic inhalation reference exposure levels for DPM and does not provide acute inhalation reference exposure levels for health risk assessments; therefore, only chronic risk is analyzed herein. The carcinogenic health risk equations follow a dose response relationship where the dosage is averaged over a particular timeframe. To provide a conservative analysis, the timeframe for construction and decommissioning activities were assumed to be equivalent and no adjustments were made to the exposure duration (i.e., exposure duration 100 percent of the time was assumed). Additionally, the high-end breathing rate (95th percentile) by age bin was used and no fraction of time at residence was applied. To assess a reasonable worst-case scenario, it was assumed that an individual could be exposed to construction and operational emissions as infants and children, and operational and decommissioning emissions as an adult over the course of a 70-year lifetime. Children are more affected by DPM emissions than adults because of the greater amount of air that they breathe on a daily basis compared to their body weight.

The air dispersion modeling for the health risk assessment was performed using the USEPA AERMOD dispersion model, version 18081, that is part of the Air Dispersion Modeling and Risk Tool (ADMRT) version 21081 created by CARB. AERMOD is a steady-state, multiple-source, Gaussian dispersion model. AERMOD requires hourly meteorological data consisting of wind vector, wind speed, temperature, stability class, and mixing height. For this analysis, AERMOD-ready meteorological data from the Mendota station (Station ID 99005), which was pre-processed with AERMET version 18081, was obtained from the SJVAPCD. The meteorological data is from the years 2007 through 2011. The meteorological station is approximately 17-miles northwest from the nearest point of the Project site and is representative of the conditions at the Project site. The meteorological data used in modeling and the wind rose are included in Appendix N-6.

Based on the anticipated construction schedule, the average workday would be approximately 10 hours for a 5-day per week schedule. Therefore, the emission rates were assumed to be limited to the hours of 7:00 a.m. to 5:00 p.m. every weekday. The model was run to obtain the maximum 1-hour and average concentration. A total of 4,590 modeling points were identified and included in the dispersion model, including 555 sensitive receptors (residences) at 25-meter spacing to provide adequate coverage for the sensitive receptors. The remaining non-sensitive receptor modeling points were spaced at 100-meter intervals that encompassed an area of approximately 1,000 feet beyond the project border and was used to evaluate the Project's potential health impact and to verify if the modeled sensitive receptors accounted for the highest off-site exposure or the point of maximum impact (PMI). Receptor and modeling locations are shown in Figure 3.

[6] OEHHA Reference Exposure Levels (RELs) are updated regularly at www.oehha.ca.gov/air/Allrels.html

The total $PM_{10}$ exhaust emissions for all on-site diesel equipment and on-site mobile emissions for the entire construction and operational period were divided by the working days and working hours per day to determine the maximum hourly emission rate. AERMOD was used to determine the non-pollutant specific concentration at receptor points by source using a unit emission rate of 1 gram per second (g/sec)). The non-pollutant specific concentration was then multiplied by the actual pollutant specific emission rates (i.e., annual average in pounds per year and maximum hourly in pounds per hour) to determine the cumulative source ground-level pollutant specific concentration (GLC) at each receptor subsequently used to determine cancer and non-cancer health impacts using the CARB Hot Spots Analysis and Reporting Program Version 2 (HARP 2) version 22118E.[7] Chronic and carcinogenic health risk were further refined by age bin based on the USEPA (2005) guidance on the use of early life exposure adjustment factors (*Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens*, EPA/630/R-003F) and standardized dose algorithms contained in the current OEHHA guidance. Consistent with CEC requirements for health risk assessment (HRA), this analysis used HARP 2 and cancer potency values and noncancer reference exposure levels approved by OEHHA (Title 20 CCR Section 1704, Appendix B).

Because HARP 2 does not include an option to evaluate health risk using partial years (i.e., 18 months for construction and 36 months for construction and decommissioning), carcinogenic health risk results presented herein were calculated using several iterations of HARP 2 in order to conservatively address risk. Risk was determined by age bin for each construction phase. Note that the estimated concentration is not a specific prediction of the actual concentrations that would occur at any one point or any specific time over the course of the construction period. Actual concentrations are dependent on many variables, particularly the number and type of equipment working at specific distances during time periods of adverse meteorology. Various activities would occur at different Project sites throughout the overall Project, and equipment would be close to adjacent receptors for a limited period of time, and then several miles from the same receptor at other times. Appendix N-5 provides input and output data for the HARP 2 Analysis. Electronic files for the AERMOD and HARP 2 modeling will be provided to the CEC under separate cover.

## Methodology for Ambient Air Quality Analysis

A localized analysis following the SJVAPCD modeling guidance documents was conducted to assess the potential impacts of construction and operational activities (SJVAPCD 2022c, 2010, 2015a, 2019). Daily and annual emissions burdens were estimated for the duration of the construction period based on providedconstruction schedule, number of pieces of construction equipment, horsepower rating of construction equipment, utilization of construction equipment, engine exhaust certifications, and construction activities as modeled. Refined air dispersion modeling of the daily emissions was conducted using AERMOD to show the project's maximum localized impacts from pollutants where mitigation does not reduce impacts to below the SJVAPCD's screening level thresholds for the anticipated construction scenarios and for Project operation. Emissions in AERMOD were set to 1 gram per sec (g/sec) and emissions were scaled in a stand-alone spreadsheet to account for actual project emissions.

Only the maximum localized pollutant levels related to on-site construction and operational activities were estimated and verified through AERMOD modeling. Emissions from mobile construction equipment were modeled as line volume or volume sources based on the size of the area modeled.

[7] See Appendix F for AERMOD output files and GLC period files used to calculate health risk.

To account for the impact of localized pollutants in combination with pollution from other sources, the modeled results were added to the background level as recommended by USEPA and SJVAPCD (SJVPACD 2010, USEPA 2017). Unique background levels are based on the specific details of the applicable standards. The resulting pollutant concentrations (modeled result and background) were then compared to the applicable NAAQS and CAAQS. Dispersion modeling parameters and the receptor grid were consistent with those used for the health risk assessment.

## 3.2 Significance Criteria

The significance criteria used to evaluate the Project impacts to air quality are based on the recommendations provided in Appendix G of the *CEQA Guidelines* (14 CCR 15000 et seq.). For the purposes of this air quality analysis, a significant impact would occur if the Project would:

1. Conflict with or obstruct implementation of the applicable air quality plan
2. Result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is nonattainment under an applicable federal or state ambient air quality standard
3. Expose sensitive receptors to substantial pollutant concentrations
4. Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people

### Annual Criteria Air Pollutant Emissions

Appendix G of the *CEQA Guidelines* (14 CCR 15000 et seq.) indicates that, where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied on to determine whether a project would have a significant impact on air quality. The SJVAPCD recommends the use of quantitative thresholds to determine the significance of temporary construction-related pollutant emissions and long-term operational-related pollutant emissions. These thresholds are shown in Table 7.

**Table 7 SJVAPCD Air Quality Significance Thresholds**

| Pollutant | Operation Thresholds (Tons per Year) | Construction Thresholds (Tons Per Year) |
|---|---|---|
| $NO_X$ | 10 | 10 |
| ROG[1] | 10 | 10 |
| $PM_{10}$ | 15 | 15 |
| $PM_{2.5}$ | 15 | 15 |
| $SO_X$ | 27 | 27 |
| CO | 100 | 100 |

[1] ROG are formed during combustion and evaporation of organic solvents. ROG are also referred to as VOC.
Source: San Joaquin Valley Air Pollution Control District 2015a

### Daily Criteria Air Pollutant Emissions

In addition to the annual SJVAPCD thresholds outlined above, SJVAPCD has published the *Ambient Air Quality Analysis Project Daily Emissions Assessment* guidance, which is summarized in Section 8.4.2, *Ambient Air Quality Screening Tools*, of the SJVAPCD's *Guidance for Assessing and Mitigating Air Quality Impacts (GAMAQI)*, adopted in March 2015.

SJVAPCD recommends comparing project attributes with the following screening criteria as a first step to evaluating whether the project would result in the generation of CO concentrations that could substantially contribute to an exceedance of the significance thresholds. The project could result in a significant impact to localized CO concentrations if (SJVAPCD 2015a):

1. A traffic study for the project indicates that the Level of Service (LOS) on one or more streets or at one or more intersections in the project vicinity will be reduced to LOS E or F
2. A traffic study indicates that the project will substantially worsen an already existing LOS F on one or more streets at more one or more intersections in the project vicinity

In addition to the criteria pollutant thresholds outlined above, SJVAPCD has published the *Ambient Air Quality Analysis Project Daily Emissions Assessment* guidance, which is summarized in Section 8.4.2, *Ambient Air Quality Screening Tools*, of the GAMAQI. The GAMAQI provides a screening threshold of 100 pounds per day of any of the following pollutants: $NO_X$, ROG, $PM_{10}$, $PM_{2.5}$, sulfur oxide ($SO_X$), and CO. The screening threshold was used to evaluate localized construction activities and operational activities separately. Per SJVAPCD's GAMAQI and Rule 9510 – Indirect Source Review, when assessing the significance of project-related impacts on local air quality, the impacts *may* be significant if on-site emissions from construction or operational activities exceed the 100 pounds per day screening level after implementation of all enforceable mitigation measures. The Project would be subject to Rule 9510 because it would develop more than 9,000 square feet, which is the ambient air quality analysis screening level threshold for unconventional land use developments not identified as residential, commercial, or industrial (e.g., a solar facility).

If the screening criteria is exceeded for any pollutant, an ambient air quality assessment (AAQA) can be conducted following District Rule 2201 *AAQA Modeling*. An AAQA uses air dispersion modeling to determine if emission increases from a project's construction or operational activities would cause or contribute to a violation of the ambient air quality standards. If modeled concentrations combined with background concentrations would result in an exceedance of a NAAQS or CAAQS, then SJVAPCD Rule 2201 requires that the maximum modeled concentration of each pollutant be compared to its corresponding Significant Impact Level (SIL). If modeled concentrations do not exceed the SIL, then the project would not result in a violation of ambient air quality standards and mitigation for that pollutant is not required. The SIL are identified in Table 8.

## Table 8 AAQA Localized Thresholds ($\mu g/m^3$)

| | NAAQS | | | | CAAQS | | | | | SIL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Averaging Time** | **1hr** | **8hr** | **24 hr** | **Annual** | **1hr** | **8hr** | **24hr** | **Annual** | **1 hr** | **8 hr** | **24 hr** | **Annual** |
| $NO_2$ | 188 | - | - | 100 | 339 | - | - | 57 | 7.5 | - | - | 1 |
| CO | 40,000 | 10,000 | - | - | 23,000 | 10,000 | - | - | 2,000 | 500 | - | - |
| $SO_2$ | 196 | - | - | - | 655 | - | 105 | - | 7.8 | - | - | - |
| $PM_{10}$ Exhaust | - | - | - | - | - | - | - | - | - | - | 5 | 1 |
| $PM_{10}$ Fugitive | - | - | - | - | - | - | - | - | - | - | 10.4 | 2.1 |

$NO_2$ = nitrogen dioxide; CO = carbon monoxide; $PM_{10}$ = coarse particles of a diameter of 10 microns or less; SIL = Significant Impact Level; $SO_2$ = sulfur dioxide

Source: San Joaquin Valley Air Pollution Control District 2015a, 2019

## Health Risk

The SJVAPCD has also established thresholds for health effects from carcinogenic and non-carcinogenic air toxics. The SJVAPCD recommends a carcinogenic (cancer) risk threshold of 20 in a million. The Chronic Hazard Index (HIC) is the sum of the individual substance chronic hazard indices for all TACs affecting the same target organ system. The SJVAPCD recommends a HIC significance threshold of 1.0 and an acute hazard index (HIA) of 1.0. No short-term, acute relative exposure values are established and regulated for DPM; therefore, acute exposure is not addressed in the HRA.

## Greenhouse Gases

The significance criteria used to evaluate the Project impacts to GHG emissions are based on the recommendations provided in Appendix G of the *CEQA Guidelines* (14 CCR 15000 et seq.). For the purposes of the GHG analysis, a significant impact would occur if the Project would:

1. Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment
2. Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs

The majority of individual projects do not generate sufficient GHG emissions to directly influence climate change. However, physical changes caused by a project can contribute incrementally to cumulative effects that are significant, even if individual changes resulting from a project are limited. The issue of climate change typically involves an analysis of whether a project's contribution towards an impact would be cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, other current projects, and probable future projects (*CEQA Guidelines*, Section 15064[h][1]).

### *Project-Level Significance Threshold*

For future projects, the significance of GHG emissions may be evaluated based on locally adopted quantitative thresholds, consistency with a regional GHG reduction plan, or consistency with statewide regulations adopted to reduce GHG emissions. A project may be found to have a less than significant impact related to GHG emissions if it complies with an adopted plan that includes specific measures to sufficiently reduce GHG emissions (14 CCR Section 15064[h][3]). According to the *CEQA Guidelines*, projects can tier from a qualified GHG reduction plan, which allows for project-level evaluation of GHG emissions through the comparison of the project's consistency with the GHG reduction policies included in that plan. The Association of Environmental Professionals considers this approach in its white paper, "Beyond Newhall and 2020," to be the most defensible approach presently available under CEQA to determine the significance of a project's GHG emissions (Association of Environmental Professionals 2016). However, the SJVAPCD's current GHG reduction strategy presented in the 2008 *Climate Change Action Plan* is based on AB 32 2020 emissions targets and does not address the SB 32 2030 emissions targets or AB 1279 2045 emissions targets. Because the GHG reduction plan does not specifically address the 2030 or 2045 targets and the project would become operational after 2020, tiering from the regional 2008 *Climate Change Action Plan* is not applicable.

Instead, the potential for the Project to conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing emissions of GHG was assessed by examining the Project's consistency with the GHG reduction measures detailed in CARB's 2022 Climate Change Scoping Plan. Under the

SJVAPCD's CEQA guidance for GHG, a project would not have a significant GHG impact if it is consistent with an applicable plan to reduce GHG emissions, and a CEQA compliant analysis was completed for the GHG reduction plan (SJVAPCD 2009b, 2015a). Project GHG emissions are quantified for informational purposes.

# 4 Impact Analysis

## 4.1 Project-Level Air Quality Impacts

| | |
|---|---|
| **Threshold 1:** | Would the Project conflict with or obstruct implementation of the applicable air quality plan? |

**Impact AQ-1 THE PROJECT WOULD CONFLICT WITH OR OBSTRUCT IMPLEMENTATION OF THE 2020 REASONABLY AVAILABLE CONTROL TECHNOLOGY (RACT) DEMONSTRATION FOR THE 2015 8-HOUR OZONE STANDARD AND THE 2013 PLAN FOR THE REVOKED 1-HOUR OZONE STANDARD, 2007 $PM_{10}$ MAINTENANCE PLAN AND REQUEST FOR RE-DESIGNATION, 2012 $PM_{2.5}$ PLAN, AND 2015 PLAN FOR THE 1997 $PM_{2.5}$ STANDARD WITHOUT MITIGATION. IMPACTS WOULD BE LESS THAN SIGNIFICANT WITH INCORPORATION OF MITIGATION.**

### Air Quality Management Plan Consistency

Construction, operation, and decommissioning of the Project would result in emissions of criteria pollutants including ozone precursors (such as ROG and $NO_X$) and PM. The SJVAPCD has prepared several air quality attainment plans to achieve ozone and particulate matter standards, the most recent of which include the *2020 Reasonably Available Control Technology (RACT) Demonstration for the 2015 8-Hour Ozone Standard* and the *2013 Plan for the Revoked 1-Hour Ozone Standard, 2007 $PM_{10}$ Maintenance Plan and Request for Re-designation, 2012 $PM_{2.5}$ Plan,* and *2015 Plan for the 1997 $PM_{2.5}$ Standard*. The SJVAB is in attainment for CO, $SO_2$, and Pb, and there are no attainment plans for those pollutants.

Per Section 7.12 of the *GAMAQI*, the SJVAPCD has determined that projects with emissions above the thresholds of significance for criteria pollutants would conflict with/obstruct implementation of the SJVAPCD's air quality plans (SJVAPCD 2015a). As discussed under Impact AQ-2, project construction and decommissioning would exceed $NO_X$ and PM annual significance thresholds for construction activities. Therefore, Project construction and decommissioning has the potential to conflict with existing air quality plans. Operational activities would not exceed the SJVAPCD thresholds for $NO_X$ and PM. Operation emissions would not conflict with implementation of existing air quality plans at a local level.

### Mitigation

The following mitigation measures would reduce impacts from $NO_X$ and PM. Implementation of Mitigation Measures AQ-1 and AQ-2 would reduce $NO_X$ and PM emissions from construction activities.

***Mitigation Measure AQ-1: Voluntary Emission Reduction Agreement***

The Applicant shall enter into a voluntary emissions reduction agreement (VERA) with the SJVAPCD to offset the $NO_X$ emissions above the 10 tons per year threshold. The VERA is a mechanism for the Applicant to fund programs to reduce $NO_X$ emissions in the SJVAB. The Applicant shall coordinate with SJVAPCD to ensure VERA funds are used for programs near the Project site to the extent feasible. The VERA shall be submitted and approved by the SJVAPCD prior to beginning construction activities.

If available and as feasible, electric equipment could be incorporated into the off-road equipment fleet to reduce $NO_X$ emissions that must be offset with the required VERA. In order to reduce the $NO_X$ emissions that must be offset with the required VERA, the Applicant shall provide commitment to available electric equipment to the CEC and the SJVAPCD prior to the issuance of a permit to construct and quantify the emissions reductions from the electric equipment. Documentation of the equipment operating on-site, shall be maintained on-site at all times during construction and decommissioning activities.

***Mitigation Measure AQ-2: Fugitive Dust Control Plan***

Prior to construction and decommissioning activities, the Applicant shall prepare a Fugitive Dust Control Plan. At a minimum, the Plan shall include the following: Control fugitive dust onsite during construction and decommissioning with a minimum of one watering across the site daily with the use of chemical stabilizers during construction activities. Additional water/chemical treatments will occur as needed based on daily site conditions and ground disturbance activities. Roads and other areas that experience high traffic volumes may be stabilized with water and/or chemicals up to four times a day. The method of monitoring site conditions for additional dust control needs shall be detailed in the plan. Chemical stabilizers shall be used for long-term fugitive dust control onsite. Specific stabilizers proposed for use and their location shall be included in the fugitive dust control plan for the project and records of watering and stabilizer application shall be kept. $PM_{10}$ reduction quantifications from this measure are to be applied prior to the finalization of a VERA for the Project.

## Significance after Mitigation

Implementation of Mitigation Measures AQ-1 and AQ-2 would reduce $NO_X$ and PM emissions from construction activities to below significance thresholds. Therefore, with the implementation of Mitigation Measure AQ-1 and AQ-2 the Project would not conflict with an applicable air quality plan and impacts would be less than significant.

| | |
|---|---|
| **Threshold 2** | Would the Project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard? |

**Impact AQ-2 PROJECT OPERATION WOULD NOT RESULT IN A CUMULATIVELY CONSIDERABLE NET INCREASE OF A CRITERIA POLLUTANT FOR WHICH THE PROJECT REGION IS IN NON-ATTAINMENT UNDER AN APPLICABLE FEDERAL OR STATE AMBIENT AIR QUALITY STANDARD. HOWEVER, PROJECT CONSTRUCTION ACTIVITIES WOULD EXCEED SIGNIFICANCE THRESHOLDS FOR $NO_X$, $PM_{10}$ AND $PM_{2.5}$, WHICH WOULD RESULT IN A CUMULATIVELY CONSIDERABLE NET IMPACT WITHOUT MITIGATION. IMPACTS WOULD BE LESS THAN SIGNIFICANT WITH THE IMPLEMENTATION OF MITIGATION.**

## Construction Impacts

### *Annual Criteria Air Pollutant Emissions*

Construction of the Project would require approximately 18 to 36 months of construction activity depending on the final construction scenario chosen. Construction would involve several overlapping phases. Refer to Table 5 in Section 3.1 for phasing specifics related to the Project construction schedule. Construction of the Project would generate air pollutant emissions from entrained dust, off-road equipment use, vehicle emissions, and architectural coatings. Off-site emissions would be generated by construction worker daily commute trips and heavy-duty diesel haul and vendor truck trips. Construction emissions would vary substantially from day to day, depending on the level of activity, the specific type of operation, and, for dust, the prevailing weather conditions. Table 9 shows the estimated annual construction emissions by construction phase and by year. The majority of PM emissions are fugitive emissions. As shown, for both the 18-Month and 36-Month construction scenarios, $NO_X$ and CO emissions exceed significance thresholds. In addition, the 18-Month construction scenario exceeds the annual $PM_{10}$ emissions threshold. Because annual emissions from Project construction would exceed significance thresholds, the Project could contribute cumulatively to a net increase in criteria pollutants without mitigation. Impacts would be potentially significant.

The green hydrogen facility in Phase 6 has since been removed from the Project. This change reduces the emissions shown in Table 9; however, removal of the hydrogen facility does not change the exceedance of thresholds for $NO_X$ and CO.

### Table 9 Annual Construction Emissions

| Phase | | Emissions (tons per year by phase) | | | | | |
|---|---|---|---|---|---|---|---|
| | | ROG | $NO_X$ | CO | $SO_X$ | $PM_{10}$ | $PM_{2.5}$ |
| **36-Month Construction Scenario – By Phase** | | | | | | | |
| Phase 1: Site Preparation | | 0.62 | 5.52 | 29.93 | 0.06 | 3.60 | 1.81 |
| Phase 2: PV Panel System | | 2.69 | **32.33** | **108.22** | 0.19 | 5.35 | 2.33 |
| Phase 3: Inverters, Transformers, Substation, and Electrical | | 0.67 | 8.87 | 29.85 | 0.21 | 0.78 | 0.44 |
| Phase 4: Gen-Tie | | 0.86 | 9.22 | 8.73 | 0.53 | 1.09 | 0.91 |
| Phase 5: BESS | | 0.21 | 5.05 | 6.82 | 0.04 | 0.75 | 0.25 |
| ~~Phase 6: Green Hydrogen Facility~~ | | ~~1.61~~ | ~~**20.07**~~ | ~~81.29~~ | ~~0.16~~ | ~~5.03~~ | ~~2.31~~ |
| Phase 7: Utility Switchyard | | 0.54 | 6.57 | 25.36 | 0.05 | 1.12 | 0.54 |
| Threshold | | 10 | 10 | 100 | 27 | 15 | 15 |
| Exceed Threshold? | | No | **Yes** | **Yes** | No | No | No |
| **36-Month Construction Scenario – By Year** | | | | | | | |
| 2025 | Solar Facility, Step-Up Substation, and Gen-Tie (Phases 1 to 4) | 0.02 | 0.05 | 0.30 | 0.02 | 0.04 | 0.03 |
| 2026 | Solar Facility, Step-Up Substation, and Gen-Tie (Phases 1 to 4) | 2.23 | 24.77 | 93.90 | 0.19 | 6.73 | 3.19 |
| | Utility Switchyard (Phase 7) | 0.54 | 6.57 | 25.36 | 0.05 | 1.12 | 0.54 |
| | **Total 2026** | **2.77** | **31.34** | **119.25** | **0.24** | **7.85** | **3.74** |
| 2027 | Solar Facility, Step-Up Substation, and Gen-Tie (Phases 1 to 4) | 3.38 | 41.36 | 138.11 | 0.25 | 6.19 | 2.65 |
| | Utility Switchyard(Phase 7) | 0.16 | 1.94 | 7.55 | 0.02 | 0.33 | 0.17 |
| | **Total 2027** | **3.54** | **43.30** | **145.65** | **0.28** | **6.52** | **2.83** |
| 2028 | Solar Facility, Step-Up Substation, and Gen-Tie (Phases 1 to 4) | 2.38 | 27.07 | 62.56 | 0.80 | 3.58 | 2.12 |
| | BESS (Phase 5) | 0.21 | 5.05 | 6.82 | 0.04 | 0.75 | 0.25 |
| | ~~Green Hydrogen Facility (Phase 6)~~ | ~~1.61~~ | ~~20.07~~ | ~~81.29~~ | ~~0.16~~ | ~~5.03~~ | ~~2.31~~ |
| | **Total 2028** | **4.21** | **52.19** | **150.67** | **0.99** | **9.36** | **4.68** |
| Maximum Annual | | 4.21 | **52.19** | **150.67** | 0.99 | 9.36 | 4.68 |
| Threshold | | 10 | 10 | 100 | 27 | 15 | 15 |
| Exceed Threshold? | | No | **Yes** | **Yes** | No | No | No |
| **18-Month Construction Scenario – By Phase** | | | | | | | |

| Phase | | Emissions (tons per year by phase) ROG | $NO_X$ | CO | $SO_X$ | $PM_{10}$ | $PM_{2.5}$ |
|---|---|---|---|---|---|---|---|
| Phase 1: Site Preparation | | 1.82 | **19.02** | 31.36 | 0.06 | 5.39 | 2.92 |
| Phase 2: PV Panel System | | 2.95 | **32.25** | **131.90** | 0.20 | 6.47 | 3.01 |
| Phase 3: Inverters, Transformers, Substation, and Electrical | | 1.06 | **12.84** | 38.05 | 0.24 | 1.21 | 0.62 |
| Phase 4: Gen-Tie | | 1.14 | 12.05 | 11.21 | 0.71 | 1.42 | 1.21 |
| Phase 5: BESS | | 0.22 | 4.39 | 10.02 | 0.02 | 0.46 | 0.15 |
| ~~Phase 6: Green Hydrogen Facility~~ | | ~~0.68~~ | ~~8.92~~ | ~~33.42~~ | ~~0.08~~ | ~~3.05~~ | ~~1.43~~ |
| Phase 7: Utility Switchyard | | 0.82 | 9.76 | 31.77 | 0.07 | 2.10 | 1.05 |
| Threshold | | 10 | 10 | 100 | 27 | 15 | 15 |
| Exceed Threshold? | | No | **Yes** | **Yes** | No | No | No |
| **18-Month Construction Scenario – By Year** | | | | | | | |
| 2025 | Solar Facility, Step-Up Substation, and Gen-Tie (Phases 1 to 4) | 0.03 | 0.17 | 0.42 | 0.01 | 0.07 | 0.04 |
| 2026 | Solar Facility, Step-Up Substation, and Gen-Tie (Phases 1 to 4) | 6.97 | 76.16 | 212.52 | 1.21 | 14.49 | 7.76 |
| | BESS (Phase 5) | 0.15 | 2.82 | 6.37 | 0.02 | 0.30 | 0.11 |
| | ~~Green Hydrogen Facility (Phase 6)~~ | ~~0.66~~ | ~~8.62~~ | ~~32.30~~ | ~~0.08~~ | ~~2.91~~ | ~~1.34~~ |
| | **Total 2026** | **7.78** | **87.60** | **251.20** | **1.31** | **17.70** | **9.22** |
| 2027 | Solar Facility, Step-Up Substation, and Gen-Tie (Phases 1 to 4) | 1.59 | 17.73 | 70.52 | 0.14 | 3.23 | 1.48 |
| | BESS (Phase 5) | 0.22 | 4.39 | 10.02 | 0.02 | 0.46 | 0.15 |
| | ~~Green Hydrogen Facility (Phase 6)~~ | ~~0.68~~ | ~~8.92~~ | ~~33.42~~ | ~~0.08~~ | ~~3.05~~ | ~~1.43~~ |
| | Utility Switchyard (Phase 7) | 0.82 | 9.76 | 31.77 | 0.07 | 2.10 | 1.05 |
| | **Total 2027** | **3.31** | **40.80** | **145.74** | **0.31** | **8.84** | **4.11** |
| Maximum Annual | | 7.78 | **87.60** | **251.20** | 1.31 | **17.70** | 9.22 |
| Threshold | | 10 | 10 | 100 | 27 | 15 | 15 |
| Exceed Threshold? | | No | **Yes** | **Yes** | No | **Yes** | No |

$NO_X$= Nitrous Oxides; ROG = Reactive Organic Gases; $PM_{10}$ = Particulate matter with a diameter of 10 microns or less; $PM_{1.5}$ = Particulate Matter with a diameter of 2.5 microns or less

Notes: Rounded values shown; columns may not total exactly. See Appendix N-2 for calculations. Bold numbers indicate an exceedance of applicable thresholds.

The Project would comply with SJVAPCD Rule 9510, Indirect Source Review, which requires large development projects to reduce exhaust emissions from construction equipment by 20 percent for $NO_X$ and 45 percent for $PM_{10}$ compared to the statewide average, or demonstrate use of a clean fleet (such US EPA Tier 4 equipment). Because the Project would use all US EPA Tier 4 equipment, the project is consistent with Rule 9510, Indirect Source Review. Compliance with SJVAPCD Rule 9510 does not result in additional emissions reductions quantification for this environmental analysis because the Project would use all US EPA Tier 4 equipment, which is accounted for in this air quality modeling. Further, in addition to the Rule 9510 requirement, the Project would comply with dust mitigation per Rule 8021 which would reduce dust emissions. Requirements of Rule 8021 are detailed in the Regional Setting above; the Project's fugitive dust control plan would comply with all applicable measures required by SJVAPCD in Rule 8021.

### *Daily Criteria Air Pollutant Emissions*

The SJVAB is a nonattainment area for ozone, $PM_{10}$, and $PM_{2.5}$ under the NAAQS and/or CAAQS. The current air quality in the SJVAB is the result of cumulative emissions from motor vehicles, off-road equipment, commercial and industrial facilities, and other emission sources. Projects that emit these pollutants or their precursors (i.e., ROG and $NO_X$ for ozone) potentially contribute to poor air quality. Construction activities would exceed the SJVAPCD's recommended 100 pounds per day screening threshold during construction, as shown in Table 10, for $NO_X$ and CO for the 36-Month construction scenario and for $NO_X$, CO, $PM_{10}$, and $PM_{2.5}$ for the 18-Month construction scenario. Because daily emissions from Project construction would exceed significance thresholds, the Project could contribute cumulatively to a net increase in criteria pollutants without mitigation. Impacts would be potentially significant.

The green hydrogen facility has since been removed from the Project. This change reduces the emissions shown in in Table 10; however, removal of the hydrogen facility does not change the exceedance of thresholds for $NO_x$ and CO.

**Table 10 Maximum Daily Construction Emissions**

| | Emissions (lbs/day) by year | | | | | |
|---|---|---|---|---|---|---|
| | ROG | $NO_X$ | CO | $SO_X$ | $PM_{10}$[1] | $PM_{2.5}$[1] |
| **36-Month Construction Schedule** | | | | | | |
| 2025 | 9 | 76 | **427** | 1 | 51 | 26 |
| 2026 | 37 | **379** | **1,570** | 3 | 98 | 48 |
| 2027 | 30 | **364** | **1,244** | 2 | 48 | 22 |
| 2028 | 49 | **574** | **2,139** | 4 | 89 | 41 |
| Maximum Daily | 49 | **574** | **2,139** | 4 | 89 | 41 |
| Screening Level | 100 | 100 | 100 | 100 | 100 | 100 |
| Exceeds Screening Level? | No | **Yes** | **Yes** | No | No | No |
| **18-Month Construction Schedule** | | | | | | |
| 2025 | 38 | **389** | **637** | 1 | **117** | 64 |
| 2026 | 79 | **857** | **3,175** | 5 | **201** | **104** |
| 2027 | 60 | **708** | **2,817** | 5 | **145** | 68 |
| Maximum Daily | 79 | **857** | **3,175** | 5 | **201** | **104** |
| Screening Level | 100 | 100 | 100 | 100 | 100 | 100 |
| Exceeds Screening Level? | No | **Yes** | **Yes** | No | **Yes** | **Yes** |

[1]Includes compliance with Rule 8021 dust control measures, which accounts for watering.

Bold values indicate where thresholds are exceeded.

Lbs/day = pounds per day; $NO_X$= Nitrous Oxides; ROG = Reactive Organic Gases; $PM_{10}$ = Particulate matter with a diameter of 10 microns or less; $PM_{1.5}$ = Particulate Matter with a diameter of 2.5 microns or less

### *Ambient Air Quality Impact Assessment*

As shown in Table 16, mitigation would reduce $NO_X$, $PM_{10}$ and $PM_{2.5}$ to below the 100 pounds per day threshold. Therefore, only CO would remain above the screening level and would be subject to an

AAQA to determine whether modeled concentrations of CO from Project construction combined with background concentrations would result in an exceedance of a NAAQS or CAAQS. As shown in Table 11, unmitigated Project construction would not exceed the SJVAPCD NAAQS or CAAQS ambient daily concentrations for CO under any construction schedule~~ or Project component Option scenario~~. While CO impacts exceed regional thresholds, the AAQA demonstrates that Project construction emissions of CO would not exceed the ambient air quality standards and, therefore, would not result in significant impacts. The green hydrogen facility, which is included in the Option I Project Components in Table 11, has since been removed from the Project; the removal of this component does not change that the Project would not exceed the thresholds shown in Table 11.

**Table 11 Maximum Refined Daily Construction Emissions**

| | | ($\mu g/m^3$) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Pollutant** | **Averaging Period** | **Background** | **Project** | **Project + Background** | **CAAQS** | **NAAQS** | **SIL** | **Exceed** |
| 36-Month Construction Schedule – Option 1 Project Components | | | | | | | | |
| CO | 1hr | 3,986.7 | 2,100 | 6,087 | 23,000 | 40,000 | 2,000 | No |
| | 8hr | 2,864.0 | 691 | 3,555 | 10,000 | 10,000 | 500 | No |
| ~~36 Month Construction Schedule -Option 2 Project Components~~ | | | | | | | | |
| ~~CO~~ | ~~1hr~~ | ~~3,986.7~~ | ~~5,055~~ | ~~9,041~~ | ~~23,000~~ | ~~40,000~~ | ~~2,000~~ | ~~No~~ |
| | ~~8hr~~ | ~~2,864.0~~ | ~~1,174~~ | ~~4,038~~ | ~~10,000~~ | ~~10,000~~ | ~~500~~ | ~~No~~ |
| ~~36 Month Construction Schedule - Option 1 Project Components with Alternate Green Hydrogen Facility~~ | | | | | | | | |
| ~~CO~~ | ~~1hr~~ | ~~3,986.7~~ | ~~1,781~~ | ~~5.767~~ | ~~23,000~~ | ~~40,000~~ | ~~2,000~~ | ~~No~~ |
| | ~~8hr~~ | ~~2,864.0~~ | ~~560~~ | ~~3,424~~ | ~~10,000~~ | ~~10,000~~ | ~~500~~ | ~~No~~ |
| ~~36 -Month Construction Schedule – Option 2 Project Components with Alternate Green Hydrogen Facility~~ | | | | | | | | |
| ~~CO~~ | ~~1hr~~ | ~~3,986.7~~ | ~~4,445~~ | ~~8,431~~ | ~~23,000~~ | ~~40,000~~ | ~~2,000~~ | ~~No~~ |
| | ~~8hr~~ | ~~2,864.0~~ | ~~978~~ | ~~3,842~~ | ~~10,000~~ | ~~10,000~~ | ~~500~~ | ~~No~~ |
| **18 Month Construction Schedule -Option 1 Project Components** | | | | | | | | |
| CO | 1hr | 3,986.7 | 7,781 | 11,768 | 23,000 | 40,000 | 2,000 | No |
| | 8hr | 2,864.0 | 1,610 | 4,474 | 10,000 | 10,000 | 500 | No |
| ~~18 Month Construction Schedule –Option 2 Project Components~~ | | | | | | | | |
| ~~CO~~ | ~~1hr~~ | ~~3,986.7~~ | ~~11,145~~ | ~~15,132~~ | ~~23,000~~ | ~~40,000~~ | ~~2,000~~ | ~~No~~ |
| | ~~8hr~~ | ~~2,864.0~~ | ~~2,439~~ | ~~5,303~~ | ~~10,000~~ | ~~10,000~~ | ~~500~~ | ~~No~~ |
| ~~18 Month Construction Schedule – Option 1 Project Components + Alternate Green Hydrogen Facility~~ | | | | | | | | |
| ~~CO~~ | ~~1hr~~ | ~~3,986.7~~ | ~~11,145~~ | ~~15,132~~ | ~~23,000~~ | ~~40,000~~ | ~~2,000~~ | ~~No~~ |
| | ~~8hr~~ | ~~2,864.0~~ | ~~1,612~~ | ~~4,476~~ | ~~10,000~~ | ~~10,000~~ | ~~500~~ | ~~No~~ |
| ~~18 Month Construction Schedule – Option 2 Project Components + Alternate Green Hydrogen Facility~~ | | | | | | | | |
| ~~CO~~ | ~~1hr~~ | ~~3,986.7~~ | ~~11,145~~ | ~~15,132~~ | ~~23,000~~ | ~~40,000~~ | ~~2,000~~ | ~~No~~ |
| | ~~8hr~~ | ~~2,864.0~~ | ~~2,439~~ | ~~5,303~~ | ~~10,000~~ | ~~10,000~~ | ~~500~~ | ~~No~~ |

Concentration calculations are included in Appendix N-6 and N-7.

## Operational Impacts

### *Annual and Daily Criteria Air Pollutants*

The Project would have up to ~~40+~~16 personnel on-site daily depending on the activities that would occur during that day. As a conservative estimate of daily emissions, it was assumed that all activities associated with the operational phase could occur on the same day resulting in ~~77~~ 53 personnel accessing the site during a given day. Annual emissions are based on the average days of activity for each operational and maintenance activity. The analysis also accounts for occasional equipment and material delivery. The proposed solar facility would ~~also have one~~include one to two O&M buildings~~, and if the green hydrogen facility is built at the alternate green hydrogen site, the Project would include a second O&M building at that location~~. ~~The green hydrogen component would also include 12 emergency diesel generators that would be used approximately 100 hours per year for testing and maintenance purposes.~~ As shown in Table 12, operational emissions from the Project would not exceed SJVAPCD annual thresholds for any criteria pollutant. As shown in Table 13, daily thresholds for CO would be exceeded and an AAQA was conducted (detailed below under *Ambient Air Quality Impact Assessment)* to determine if impacts would exceed the NAAQS or CAAQS. Operation and maintenance of the utility switchyard would be performed remotely by PG&E and therefore would result in nominal emissions from infrequent vehicle trips to and from the utility switchyard during operation. No diesel generators or other non-electric equipment would be used that result in emissions of criteria air pollutants. The green hydrogen facility has since been removed from the Project, which reduces the number of on-site personnel and daily traffic trips. The removal of this component does not change that the Project would not exceed the thresholds shown in Table 12, nor does it change that the Project would exceed the threshold for CO shown in Table 13.

### Table 12 Estimated Annual Operational Emissions

| | Emissions | | | | | |
|---|---|---|---|---|---|---|
| **Source** | **ROG** | **$NO_X$** | **CO** | **$SO_X$** | **$PM_{10}$** | **$PM_{2.5}$** |
| Solar Facility | 1.25 | 0.33 | 2.79 | 5.08 | 0.07 | 0.03 |
| Road and Fence Repair | 0.02 | 0.08 | 0.11 | 0.01 | 0.01 | 0.01 |
| Road Reconditioning | 0.07 | 0.50 | 0.70 | <0.01 | 0.06 | 0.03 |
| Solar Panel Washing | 0.05 | 0.27 | 0.44 | 0.01 | 0.02 | 0.02 |
| Vegetation and Pest Management | 0.2 | 1.95 | 3.84 | 0.01 | 0.08 | 0.06 |
| ~~Green Hydrogen Facility Personnel~~ | ~~0.77~~ | ~~0.71~~ | ~~1.90~~ | ~~1.99~~ | ~~0.07~~ | ~~0.02~~ |
| Total (tons/year) | 2.02 | 1.04 | 4.69 | 7.07 | 0.14 | 0.04 |
| Threshold | 10 | 10 | 27 | 100 | 15 | 15 |
| Exceed Threshold? | No | No | No | No | No | No |
| ~~Alternate Green Hydrogen Facility O&M Building~~ | ~~0.04~~ | ~~0~~ | ~~0~~ | ~~0~~ | ~~0~~ | ~~0~~ |
| ~~Green Hydrogen Facility Personnel~~ | ~~0.77~~ | ~~0.71~~ | ~~1.90~~ | ~~1.99~~ | ~~0.07~~ | ~~0.02~~ |
| Solar Facility | 1.25 | 0.33 | 2.79 | 5.08 | 0.07 | 0.03 |
| Total (tons/year) | 2.07 | 1.04 | 4.69 | 7.07 | 0.14 | 0.04 |
| Threshold | 10 | 10 | 27 | 100 | 15 | 15 |
| Exceed Threshold? | No | No | No | No | No | No |

$NO_X$= Nitrous Oxides; ROG = Reactive Organic Gases; $PM_{10}$ = Particulate matter with a diameter of 10 microns or less; $PM_{1.5}$ = Particulate Matter with a diameter of 2.5 microns or less; lbs/day = pounds per day

Totals may not add up due to rounding vehicles. See Appendix N-2 for calculations.

### Table 13 Estimated Daily Operational Emissions

| | Emissions (lbs/day) | | | | | |
|---|---|---|---|---|---|---|
| **Source** | **ROG** | **$NO_X$** | **CO** | **$SO_X$** | **$PM_{10}$** | **$PM_{2.5}$** |
| Option~~s~~ 1 ~~and 2~~ Total Daily Operations | 15.77 | 86.06 | 127.15 | 0.24 | 7.90 | 4.23 |
| *SJVAPCD Operational Threshold* | *100* | *100* | *100* | *100* | *100* | *100* |
| Exceed Threshold? | No | No | **Yes** | No | No | No |
| ~~Alternate Green Hydrogen Total Daily Operations~~ | ~~30.79~~ | ~~86.06~~ | ~~127.15~~ | ~~0.24~~ | ~~7.90~~ | ~~4.23~~ |
| ~~*SJVAPCD Operational Threshold*~~ | ~~*100*~~ | ~~*100*~~ | ~~*100*~~ | ~~*100*~~ | ~~*100*~~ | ~~*100*~~ |
| ~~Exceed Threshold?~~ | ~~No~~ | ~~No~~ | ~~**Yes**~~ | ~~No~~ | ~~No~~ | ~~No~~ |

$NO_X$= Nitrous Oxides; ROG = Reactive Organic Gases; $PM_{10}$ = Particulate matter with a diameter of 10 microns or less; $PM_{1.5}$ = Particulate Matter with a diameter of 2.5 microns or less; lbs/day = pounds per day

Totals may not add up due to rounding vehicles. See Appendix N-2 for calculations. Bold numbers indicate an exceedance of applicable

| |
|---|
| thresholds. |

*Ambient Air Quality Impact Assessment*

Operational activities would exceed the SJVAPCD's recommended 100 pounds per day screening threshold for CO as shown in Table 12. Therefore, an AAQA for CO was conducted for operational activities. As shown in Table 14, Project operation would not exceed the NAAQS or CAAQS ambient concentrations. Therefore, emissions of CO during Project operation would not contribute substantially to an existing or projected air quality violation. Impacts would be less than significant. The green hydrogen facility has since been removed from the Project; the removal of this component does not change that the Project would not exceed the thresholds shown in Table 14.

**Table 14 Maximum Refined Daily Operational Emissions**

| Pollutant | Averaging Period | ($\mu g/m^3$) Background | Project | Project + Background | CAAQS | NAAQS | SIL | Exceed |
|---|---|---|---|---|---|---|---|---|
| CO | 1hr | 3,986.7 | 53.2 | 4039.9 | 23,000 | 40,000 | NA | No |
| | 8hr | 2,864.0 | 14.9 | 2878.9 | 10,000 | 10,000 | NA | No |

NA = not applicable

Concentrations determination included in Appendix N-6 and N-7.

## Decommissioning Impacts

Decommissioning activities at the end of the Project's useful life (anticipated to be 35 years) would completely remove all project components from the site, except for the utility switchyard. At this time, it is not possible to quantitatively evaluate potential air quality impacts that would result from Project decommissioning since technology and construction practices available at that time would be speculative. Therefore, based on current decommissioning practices and as a reasonable worst-case scenario, this analysis assumes that air quality impacts generated during future decommissioning would be similar to air quality impacts generated during the construction phase of the Project.

The Project would comply with SJVAPCD Rule 8021, which requires implementation of dust control measures, and SJVAPCD Rule 9510, Indirect Source Review, which requires reduction of engine exhaust emissions of $NO_X$ and $PM_{10}$. Moreover, emissions would be reduced due to the more stringent USEPA emission standards for diesel engines and cleaner vehicles in later years. As such, decommissioning activities on the Project site could result in exceedances of SJVAPCD thresholds for $NO_X$, $PM_{10}$, and $PM_{2.5}$ for an 18-month decommissioning phase similar to construction activities and would result in potentially significant impacts.

## Mitigation

Implement Mitigation Measures AQ-1 to AQ-2 to reduce $NO_X$, $PM_{2.5}$ and $PM_{10}$ emissions from construction activities.

## Significance after Mitigation

Implementation of Mitigation Measures AQ-1 and AQ-2 would reduce $NO_X$ emissions from the 36-month construction schedule and $NO_X$, $PM_{10}$, and $PM_{2.5}$ emissions from the 18-Month construction schedule to below significance thresholds. Table 15 shows mitigated construction emissions. While CO impacts exceed regional thresholds, the Ambient Air Quality Analysis demonstrates that CO impacts would not exceed the ambient air quality standards and, therefore, would not result in significant impacts. As shown in Table 16, implementation of Mitigation Measures AQ-1 and AQ-2 would reduce impacts to less than significant levels for NOx, PM10 and PM2.5. CO exceedances of daily thresholds are analyzed as part of an Ambient Air Quality Analysis as discussed above, and as shown in Table 11, unmitigated CO emissions would not exceed AAQS. Therefore, with the implementation of Mitigation Measure AQ-1 and AQ-2, $NO_X$, $PM_{10}$ and $PM_{2.5}$ emissions would be reduced to less than significant levels. The green hydrogen facility has since been removed from the Project, reducing overall emissions. Even with the removal of the hydrogen facility, significance findings would not change.

**Table 15 Mitigated Annual Construction Emissions**

| Phase | | Emissions (tons per year by phase) ROG | $NO_X$ | CO | $SO_X$ | $PM_{10}$ | $PM_{2.5}$ |
|---|---|---|---|---|---|---|---|
| **36-Month Construction Scenario** | | | | | | | |
| 2025 | Total 2025 | 0.02 | 0.05 | 0.30 | 0.02 | 0.04 | 0.03 |
| 2026 | Total 2026 | 2.77 | 31.34 | 119.25 | 0.24 | 7.85 | 3.74 |
| 2027 | Total 2027 | 3.54 | 43.30 | 145.65 | 0.28 | 6.52 | 2.83 |
| 2028 | Total 2028 | 4.21 | 52.19 | 150.67 | 0.99 | 9.36 | 4.68 |
| **Maximum Annual** | | **4.21** | **52.19** | **150.67** | **0.99** | **9.36** | **4.68** |
| 2025 VERA Offset | | - | (0.00) | - | - | - | - |
| 2026 VERA Offset | | - | (21.39) | - | - | - | - |
| 2027 VERA Offset | | - | (33.35 | - | - | - | - |
| 2028 VERA Offset | | - | (42.24) | - | - | - | - |
| Total VERA Offsets (total Tons) | | | (96.98) | | | | |
| Maximum Annual With Mitigation[1] (VERA annually) | | | 9.95 | | | | |
| Threshold | | 10 | 10 | 100 | 27 | 15 | 15 |
| Exceed Threshold? | | No | No | **Yes[2]** | No | No | No |
| **18-Month Construction Scenario** | | | | | | | |
| 2025 | Total 2025 | 0.03 | 0.17 | 0.42 | 0.01 | 0.07 | 0.04 |
| 2026 | Total 2026 | 7.78 | 87.60 | 251.20 | 1.31 | 17.70 | 9.22 |
| 2027 | Total 2027 | 3.31 | 40.80 | 145.74 | 0.31 | 8.84 | 4.11 |
| **Maximum Annual** | | 7.78 | **87.60** | **251.20** | 1.31 | **17.70** | 9.22 |
| 2025 VERA Offset | | - | (0.00) | - | - | - | - |
| 2026 VERA Offset | | - | (21.39) | - | - | - | - |
| 2027 VERA Offset | | - | (33.35 | - | - | - | - |
| Total VERA Offsets (total Tons) | | | (108.50) | | | (1.75) | |
| Maximum Annual With VERA[1] (VERA annually) | | | 9.95 | | | 14.95 | |
| Threshold | | 10 | 10 | 100 | 27 | 15 | 15 |
| Exceed Threshold? | | No | No | **Yes[2]** | No | No | No |

$NO_X$= Nitrous Oxides; ROG = Reactive Organic Gases; $PM_{10}$ = Particulate matter with a diameter of 10 microns or less; $PM_{1.5}$ = Particulate Matter with a diameter of 2.5 microns or less

Notes: Rounded values shown; columns may not total exactly. See Appendix N-2 for calculations.

The mitigated emissions estimates shown in this table are for illustrative purposes. Depending on the ultimate availability of electric construction equipment, as allowed for by Mitigation Measure AQ-1, the final VERA offset amounts may differ from those shown in this table.

[1] VERA offsets would be required for the total project not just the maximum year.

[2] CO exceedances of thresholds are analyzed as part of an Ambient Air Quality Analysis discussed above, and as shown in Table 11

| Phase | Emissions (tons per year by phase) | | | | | |
|---|---|---|---|---|---|---|
| | ROG | $NO_X$ | CO | $SO_X$ | $PM_{10}$ | $PM_{2.5}$ |
| unmitigated CO emissions would not exceed ambient air quality standards | | | | | | |

**Table 16 Maximum Mitigated Daily Construction Emissions**

| | Emissions (lbs/day) by year | | | | | |
|---|---|---|---|---|---|---|
| | ROG | $NO_X$ | CO | $SO_X$ | $PM_{10}$[1] | $PM_{2.5}$[1] |
| **36-Month Construction Schedule** | | | | | | |
| 2025 | 9 | 76 | **427** | 1 | 51 | 26 |
| 2026 | 37 | **379** | **1,570** | 3 | 98 | 48 |
| 2027 | 30 | **364** | **1,244** | 2 | 48 | 22 |
| 2028 | 49 | **574** | **2,139** | 4 | 89 | 41 |
| Maximum Daily | 49 | **574** | **2,139** | 4 | 89 | 41 |
| Screening Level | 100 | 100 | 100 | 100 | 100 | 100 |
| Exceeds Screening Level? | No | **No** | **Yes**[2] | No | No | No |
| **18-Month Construction Schedule** | | | | | | |
| 2025 | 38 | **389** | **637** | 1 | **117** | 64 |
| 2026 | 79 | **857** | **3,175** | 5 | **201** | **104** |
| 2027 | 60 | **708** | **2,817** | 5 | **145** | 68 |
| Maximum Daily | 79 | **857** | **3,175** | 5 | **201** | **104** |
| Max with MM AQ-1 (VERA) | | 77 | | | **115** | |
| Max with MM AQ-2 | | | | | **90** | **82** |
| Screening Level | 100 | 100 | 100 | 100 | 100 | 100 |
| Exceeds Screening Level? | No | **No** | **Yes**[2] | No | **No** | **No** |

Lbs/day = pounds per day; $NO_X$= Nitrous Oxides; ROG = Reactive Organic Gases; $PM_{10}$ = Particulate matter with a diameter of 10 microns or less; $PM_{1.5}$ = Particulate Matter with a diameter of 2.5 microns or less

[1]Includes compliance with Rule 8021 dust control measures, which accounts for watering.

[2]CO exceedances of thresholds are analyzed as part of an Ambient Air Quality Analysis discussed above, and as shown in Table 14 unmitigated CO emissions would not exceed ambient air quality standards

Similar to construction activities, decommissioning impacts would be reduced to a less than significant level with the incorporation of Mitigation Measures AQ-1 and AQ-2. Therefore, the proposed decommissioning activities, similar to construction activities, would result in less than significant impacts with implementation of Mitigation Measures AQ-1 and AQ-2.

| | |
|---|---|
| **Threshold 3:** | Would the Project expose sensitive receptors to substantial pollutant concentrations? |

**Impact AQ-3** CONSTRUCTION AND OPERATION OF THE PROJECT WOULD NOT RESULT IN EMISSIONS OF TACS SUFFICIENT TO EXCEED APPLICABLE HEALTH RISK CRITERIA. THE PROJECT WOULD NOT INCREASE CARBON MONOXIDE CONCENTRATIONS SUCH THAT IT WOULD CREATE CARBON MONOXIDE HOTSPOTS. HOWEVER, THE

**PROJECT MAY EXPOSE WORKERS AND NEARBY RECEPTORS TO VALLEY FEVER WITHOUT MITIGATION. IMPACTS WOULD BE LESS THAN SIGNIFICANT WITH IMPLEMENTATION OF MITIGATION.**

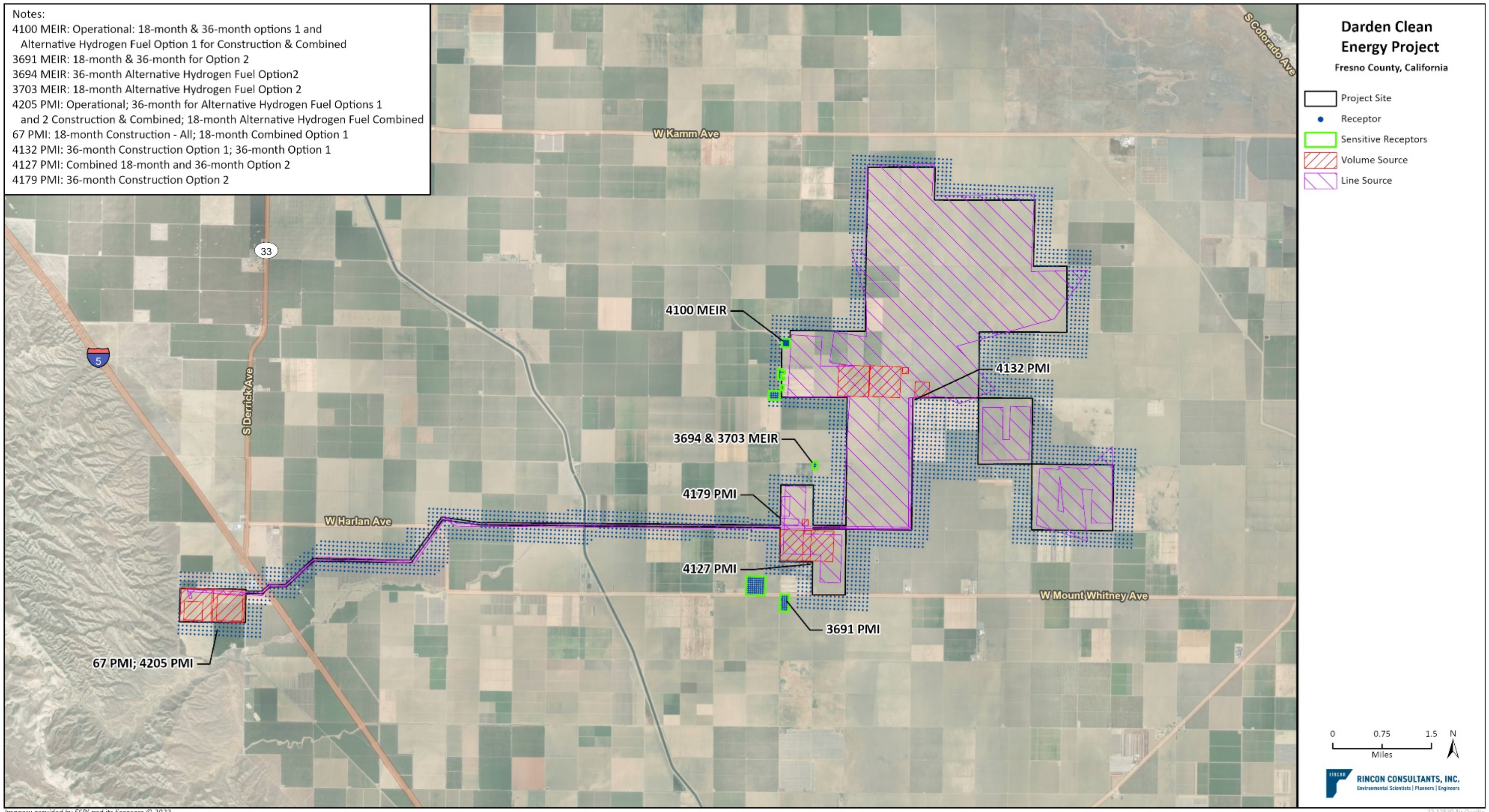
## Toxic Air Containments

### *Construction Health Risk Assessment*

As described in Section 1.3, *Project Description*, Project components would be constructed over a period of 18 to 36 months. Construction of the Project would require use of heavy-duty construction equipment and diesel trucks which would emit DPM. Figure 4 shows the receptor grids used to model health risk, the receptor grid off-site PMI, and the maximum exposed individual resident (MEIR).

The carcinogenic and chronic health risks at the MEIR and non-sensitive receptor PMI from construction and cumulative (construction, decommissioning and operational) risks are contained in Table 17 (refer to Appendix N-6 for detailed health risk calculations). The cancer risks shown in Table 17 represent the maximum risk at the location of an individual receptor or modeling point at a specific age. It is assumed in the HRA that the MEIR would be exposed to construction exhaust emissions while they are a third trimester fetus and a two-year-old child. Decommissioning was conservatively assumed to equal the risk of construction activities. Note that the chronic risk hazard quotient is a unitless value that represents non-carcinogenic risk, and this value is based on the maximum annual concentration. The Project MEIR was determined to be at a single-family residential property east of South Sonoma Avenue south of Elkhorn Avenue or the single-family residential properties at the southwest corner of South Sonoma Avenue and Mount Whitney Avenue depending on the construction option chosen (as shown in Figure 4). As shown in Table 17, excess cancer risk and chronic risk associated with Project construction would be up to 0.20 per million at the MEIR and up to 2.0 per million at the PMI, which would not exceed the significance threshold of 20 per million. Chronic risk would not exceed the threshold of 1.0 hazard index. It is conservatively assumed that decommissioning would be similar to construction risk. Construction and decommissioning risk would not exceed the significance thresholds at the PMI or the MEIR even if construction occurred at all parcels simultaneously. Impacts would be less than significant. The green hydrogen facility has since been removed from the Project, reducing overall emissions. As impacts related to this threshold are already less than significant, removal of this Project component does not change the significance findings.

## Figure 4 Sources, Sensitive Receptors, and PMI and MEIR Locations and Results

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22-12530 Air Quality
Fig 3 Sources and Receptors

## Table 17 Health Risks Associated with Diesel Particulate Emissions During Project Construction, Operation, and Decommissioning

| Construction Phase | Cancer Risk (per one million)[5] | | | | Chronic Risk | | | |
|---|---|---|---|---|---|---|---|---|
| | Option 1 | ~~Option 2~~ | ~~Alt Opt 1~~ | ~~Alt Opt 2~~ | Option 1 | ~~Option 2~~ | ~~Alt Opt 1~~ | ~~Alt Opt 2~~ |
| **36-Month Construction Schedule** | | | | | | | | |
| Phase 1 – Site Preparation | 0.0066 | ~~0.0066~~ | ~~0.0066~~ | ~~0.0066~~ | 2.6E-05 | ~~2.6E-05~~ | ~~2.6E-05~~ | ~~2.6E-05~~ |
| Phase 2 – PV Panel System | 0.0572 | ~~0.0572~~ | ~~0.0572~~ | ~~0.0572~~ | 1.1E-04 | ~~1.1E-04~~ | ~~1.1E-04~~ | ~~1.1E-04~~ |
| Phase 3 – Inverters, Transformers, and Electrical Collection System | 0.0155 | ~~0.0248~~ | ~~0.0155~~ | ~~0.0248~~ | 2.2E-03 | ~~1.8E-03~~ | ~~2.2E-03~~ | ~~1.8E-03~~ |
| Phase 4 – Gen-Tie | 0.0010 | ~~0.0010~~ | ~~0.0010~~ | ~~0.0010~~ | 1.4E-05 | ~~1.4E-05~~ | ~~1.4E-05~~ | ~~1.4E-05~~ |
| Phase 5 – BESS | 0.0016 | ~~0.0037~~ | ~~0.0016~~ | ~~0.0037~~ | 4.4E-04 | ~~2.2E-04~~ | ~~4.4E-04~~ | ~~1.4E-05~~ |
| ~~Phase 6 – Green Hydrogen Facility~~ | ~~0.0482~~ | ~~0.0556~~ | ~~0.0024~~ | ~~0.0024~~ | ~~7.9E-04~~ | ~~1.7E-03~~ | ~~2.9E-03~~ | ~~2.9E-03~~ |
| Phase 7 – Switchyard | 0.0009 | ~~0.0009~~ | ~~0.0009~~ | ~~0.0009~~ | 2.0E-03 | ~~2.0E-03~~ | ~~2.0E-03~~ | ~~2.0E-03~~ |
| Total MEIR[1] | 0.1253 | ~~0.1253~~ | ~~0.0810~~ | ~~0.0823~~ | 1.8E-04 | ~~2.0E-04~~ | ~~9.0E-05~~ | ~~9.7E-05~~ |
| Combined MEIR[2] | 0.4331 | ~~0.4289~~ | ~~0.3443~~ | ~~0.3224~~ | NA | ~~NA~~ | ~~NA~~ | ~~NA~~ |
| PMI[3] | 1.6948 | ~~1.3395~~ | ~~1.4741~~ | ~~1.4742~~ | 3.0E-03 | ~~4.2E+03~~ | ~~3.0E-03~~ | ~~3.0E-03~~ |
| Combined PMI[4] | 4.0395 | ~~3.6115~~ | ~~5.7621~~ | ~~5.7623~~ | NA | ~~NA~~ | ~~NA~~ | ~~NA~~ |
| Threshold | 20 | ~~20~~ | ~~20~~ | ~~20~~ | 1 | ~~1~~ | ~~1~~ | ~~1~~ |
| Exceed Threshold | No | ~~No~~ | ~~No~~ | ~~No~~ | No | ~~No~~ | ~~No~~ | ~~No~~ |
| **18 – Month Construction Schedule** | | | | | | | | |
| Phase 1 – Site Prep | 0.0744 | ~~0.0744~~ | ~~0.0745~~ | ~~0.0745~~ | 1.3E-04 | ~~1.3E-04~~ | ~~1.3E-04~~ | ~~1.3E-04~~ |
| Phase 2 – PV Panel System | 0.0659 | ~~0.0659~~ | ~~0.0659~~ | ~~0.0659~~ | 5.4E-05 | ~~5.4E-05~~ | ~~5.4E-05~~ | ~~5.4E-05~~ |
| Phase 3 – Inverters, Transformers, and Electrical Collection System | 0.0133 | ~~0.0213~~ | ~~0.0133~~ | ~~0.0213~~ | 2.7E-05 | ~~1.8E-06~~ | ~~2.7E-05~~ | ~~1.8E-06~~ |
| Phase 4 – Gen-Tie | 0.0019 | ~~0.0019~~ | ~~0.0019~~ | ~~0.0019~~ | 1.8E-06 | ~~1.8E-06~~ | ~~1.8E-06~~ | ~~1.8E-06~~ |
| Phase 5 – BESS | 0.0035 | ~~0.0078~~ | ~~0.0035~~ | ~~0.0078~~ | 7.0E-06 | ~~1.6E-05~~ | ~~7.0E-06~~ | ~~1.6E-05~~ |
| ~~Phase 6 – Green Hydrogen Facility~~ | ~~0.0526~~ | ~~0.0607~~ | ~~0.0026~~ | ~~0.0026~~ | ~~8.0E-05~~ | ~~9.2E-05~~ | ~~4.0E-06~~ | ~~4.0E-06~~ |
| Phase 7 – Switchyard | 0.0017 | ~~0.0017~~ | ~~0.0017~~ | ~~0.0017~~ | 2.6E-06 | ~~2.6E-06~~ | ~~2.6E-06~~ | ~~2.6E-06~~ |
| Total MEIR[1] | 0.2045 | ~~0.1831~~ | ~~0.1562~~ | ~~0.1542~~ | 2.9E-04 | ~~2.3E-04~~ | ~~2.2E-04~~ | ~~1.9E-04~~ |

| Construction Phase | Cancer Risk (per one million)[5] Option 1 | ~~Option 2~~ | ~~Alt Opt 1~~ | ~~Alt Opt 2~~ | Chronic Risk Option 1 | ~~Option 2~~ | ~~Alt Opt 1~~ | ~~Alt Opt 2~~ |
|---|---|---|---|---|---|---|---|---|
| Combined MEIR[2] | 0.6402 | ~~0.5921~~ | ~~0.5435~~ | ~~0.5205~~ | NA | ~~NA~~ | ~~NA~~ | ~~NA~~ |
| PMI[3] | 1.9285 | ~~1.9287~~ | ~~2.0458~~ | ~~2.0459~~ | 3.2E-03 | ~~2.9E-03~~ | ~~3.1E-03~~ | ~~3.1E-03~~ |
| Combined PMI[4] | 4.2479 | ~~4.2691~~ | ~~7.0812~~ | ~~7.0814~~ | NA | ~~NA~~ | ~~NA~~ | ~~NA~~ |
| Threshold | 20 | ~~20~~ | ~~20~~ | ~~20~~ | 1 | ~~1~~ | ~~1~~ | ~~1~~ |
| Exceed Threshold | No | ~~No~~ | ~~No~~ | ~~No~~ | No | ~~No~~ | ~~No~~ | ~~No~~ |

[1] Total risk is the sum of the risk for each phase by receptor. Total risk will not equal the sum of the individual phases as the maximum for each individual phase was reported regardless of receptor location. Total represents maximum residential receptor (MEIR)

[2] Combined MEIR is the maximum risk for a residential receptor, including construction, operational, and decommissioning (assumed as equal to construction as a conservative estimate) risk.

[3] PMI is the maximum non-sensitive receptor off-site risk.

[4] Combined PMI is the maximum risk for all receptors (residential and non-sensitive receptor), including construction, operational and decommissioning (assumed as equal to construction as a conservative estimate) risk.

[5] Cancer risk is presented for the following scenarios:

Option 1: Construction scenario that includes all Option 1 site components for step-up substation, BESS, and green hydrogen facility. Removal of the green hydrogen facility from the Project does not change the conclusions.

Option 2: Construction scenario that includes all Option 2 site components for step-up substation, BESS, and green hydrogen facility. This option has subsequently been removed from the Project.

Alt Opt 1: Construction Scenario that includes that includes Option 1 site components for step-up substation and BESS, and alternate site for green hydrogen facility. This option has subsequently been removed from the Project.

Alt Opt 2: Construction Scenario that includes that includes Option 2 site components for step-up substation and BESS, and alternate site for green hydrogen facility. This option has subsequently been removed from the Project.

Modeling results are included in Appendix N-6.

*Operation*

As previously discussed, health impacts due to DPM are largely related to construction equipment exhaust. Operational activities throughout the Project site would use some diesel-fueled off-road equipment. Operational activities would, therefore, result in potential health risk impacts. Operational activities were modeled for a 30-year exposure consistent with procedures described in Methodology. Both 27.5- and 28.5-year operational exposures were modeled to add to the 36-month and 18-month construction schedules to determine the combined construction and operational risk as shown in Table 17 Increased cancer risk is 0.37 per million at the MEIR and 5.69 per million at the PMI for operational activities. Non-cancer risk is 0.0001 for the MEIR and 0.002 for the PMI location. Operational risk impacts would be less than significant. Combined risk for the Project is the combination of the health risk from construction, decommissioning, and operational activities at receptor locations. As shown in Table 17, the combined cancer risk is up to 0.64 per million at the MEIR and 7.08 per million at the PMI, which would not exceed the significance threshold of 20 per million. Chronic risk is annually assessed and, therefore, maximum chronic risk is equal to the individual chronic risks for construction, operation, and decommissioning. -The green hydrogen facility has since been removed from the Project, reducing overall emissions. As impacts related to this threshold are already less than significant, removal of this Project component does not change the significance findings.

## CO Hotspots

A CO hotspot is a localized concentration of CO that is above a CO ambient air quality standard. Localized CO hotspots can occur at intersections with heavy peak hour traffic. Specifically, hotspots can be created at intersections where traffic levels are sufficiently high such that the local CO concentration exceeds the federal one-hour standard of 35.0 parts per million (ppm) or the federal and state eight-hour standard of 9.0 ppm (SJVAPCD 2022a).

The entire SJVAB is in conformance with state and federal carbon monoxide standards and no air quality monitoring stations report carbon monoxide levels in the SJVAPCD jurisdiction. Additionally, CARB no longer reports carbon monoxide concentrations anywhere in California. Based on the low background level of carbon monoxide in the SJVAB (indicated by the lack of monitoring at state or local levels), the low and the ever-improving emissions standards for new sources in accordance with state and federal regulations, and the fact that the project would result in a maximum of 60 trips per day as estimated by the Applicant during operational and maintenance activities. The Project would not cause the LOS on affected roadways to be reduced to LOS E or F and would not substantially worsen an existing LOS F roadway. Therefore, the project would not create new carbon monoxide hotspots. Additionally, as demonstrated under Impact AQ-2, CO emissions during construction and operation for the overall project, including mobile sources, would not exceed ambient air quality standards. Therefore, the project would not expose sensitive receptors to substantial carbon monoxide concentrations, and localized air quality impacts related to carbon monoxide hot spots would be less than significant.

## Valley Fever

Construction activities that include ground disturbance can result in fugitive dust, which can cause fungus *Coccidioides* spores to become airborne if they are present in the soil. These spores can cause Valley Fever. Workers who disturb soil where fungal spores are found, whether by digging, operating earthmoving equipment, driving vehicles, or by working in dusty, wind-blown areas, are more likely to breathe in spores and become infected. It is not a contagious disease and secondary infections are rare. The eastern portion of the Project site is located in western Fresno County where the risk is higher compared to other parts of the County (Fresno County 2023). Construction activities associated with the Project would include ground-disturbing activities that could result in an increased potential for exposure of nearby residents and on-site workers to airborne spores, if they are present. Compliance with dust control measured required by SJVAPCD Rule 8021 (as detailed in Table 3) would minimize personnel and public exposure to Valley Fever and reduce the potential risk of nearby resident and on-site worker exposure to Valley Fever. However, without additional controls, impacts resulting from the Project would still be potentially significant. Mitigation Measures AQ-2 and AQ-3 are provided to ensure that personnel and public exposure to Valley Fever is minimized to the greatest extent feasible. Therefore, impacts would be less than significant with implementation of Mitigation Measures AQ-2 and AQ-3.

## Mitigation

### *AQ-3 Minimize Personnel and Public Exposure to Valley Fever*

Prior to site preparation, grading activities, or ground disturbance, the Applicant shall prepare a Fugitive Dust Control Plan for the Project. The Fugitive Dust Control Plan shall include the following at a minimum:

- Equipment, vehicles, and other items shall be cleaned thoroughly of dust before they are moved off-site to other work locations.
- Wherever possible, grading, and trenching work shall be phased so that earth-moving equipment works well ahead or down-wind of workers on the ground.
- The area immediately behind grading or trenching equipment shall be sprayed with water before ground workers move into the area.
- If a water truck runs out of water before dust is dampened sufficiently, ground workers exposed to dust are to leave the area until a full truck resumes water spraying.
- All heavy-duty earth-moving vehicles shall be closed-cab and equipped with a High Efficiency Particulate Arrestance (HEPA) filtered air system.
- N95 respirators shall be provided to onsite workers for the duration of the construction period.
- Workers shall receive training to recognize the symptoms of Valley Fever and shall be instructed to promptly report suspected symptoms of work-related Valley Fever to a supervisor. Evidence of training shall be provided to the Fresno County Planning and Community Development Department within 24 hours of the training session.
- A Valley Fever informational handout shall be provided to all on-site construction personnel. The handout shall provide, at a minimum, information regarding the symptoms, health effects, preventative measures, and treatment.

## Significance After Mitigation.

Mitigation Measure AQ-3 would ensure that personnel and public exposure to Valley Fever is minimized to the greatest extent possible. Mitigation Measure AQ-2 would provide additional reduction in fugitive dust generation. Therefore, impacts would be less than significant with implementation of Mitigation Measures AQ-2 and AQ-3.

| Threshold 4: | Would the Project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people? |
|---|---|

**Impact AQ-4 THE PROJECT WOULD NOT GENERATE ODORS ADVERSELY AFFECTING A SUBSTANTIAL NUMBER OF PEOPLE DURING CONSTRUCTION OR OPERATION. IMPACTS WOULD BE LESS THAN SIGNIFICANT.**

Substantial objectionable odors are normally associated with agriculture, wastewater treatment, industrial uses, or landfills. The Project would involve the construction, operation and maintenance, and decommissioning of a solar energy facility and associated infrastructure that do not produce objectionable odors. During construction activities, only short-term, temporary odors from vehicle exhaust and construction equipment engines would occur. Construction-related odors would disperse and dissipate and would not cause substantial odors at the closest sensitive receptors (adjacent residences). In addition, construction-related odors would be short-term and would cease upon completion of construction. Operation of the Project would also emit construction-related odors based on the equipment used to facilitate the activities~~ as well as the potential use of diesel emergency generators for the green hydrogen facility~~. Impacts would be less than significant. The green hydrogen facility has since been removed from the Project, reducing overall emissions.

## 4.2 Cumulative Air Quality Impacts

The geographic scope for the cumulative air quality impact analysis is the SJVAB. Because the SJVAB is designated as non-attainment for the ozone, $PM_{10}$, and $PM_{2.5}$ NAAQS and CAAQS, there is an existing adverse cumulative effect in the SJVAB relative to these pollutants. The green hydrogen facility has since been removed from the Project, reducing overall emissions; however, removal of this Project component does not change the significance findings documented throughout this document.

Based on SJVAPCD thresholds in the GAMAQI, a project would have a significant cumulative impact if it is inconsistent with the applicable adopted federal and state air quality plans. As discussed under Impacts AQ-1 and Impact AQ-2, the Project would exceed SJVAPCD thresholds for $NO_X$, CO, and PM. CO, while exceeding regional thresholds, was modeled per the SJVAPCD AAQA methodology and compared to ambient air quality standards, as discussed in Impact AQ-2. CO concentrations would not exceed the ambient air quality standards and, therefore, CO impacts would be less than significant. With implementation of Mitigation Measures AQ-1 and AQ-2 emissions of $NO_X$ and PM would be reduced to below significance thresholds. Therefore, as discussed above under Impact AQ-1, the Project would not conflict with or obstruct implementation of the SJVAPCD's air quality plan with mitigation, and the Project's contribution to cumulative air quality impacts would be less than significant with mitigation.

The SJVAPCD considers TAC emissions to be a localized issue. In general, TAC concentrations are typically highest near the emissions sources and decline with increased distance. CARB recommends distances that should be incorporated when siting new sources or sensitive receptors near a source of TACs. This generally ranges from 500 to 1,000 feet depending on the source category (CARB 2005). Therefore, in the absence of any specific guidance from the SJVAPCD, the potential cumulative impacts from TACs were analyzed based on a radius of 1,000 feet measured from the Project site boundary. The Project is not located within 1,000 feet of any existing or planned projects that would generate TACs affecting a substantial number of people. Therefore, cumulative health risk impacts would be less than significant, as demonstrated in Impact AQ-3.

As discussed under Impact AQ-3, construction, operation, and decommissioning-related traffic is not anticipated to create a CO hotspot, as construction and decommissioning would be short-term and the nearest intersection is more than one mile from any sensitive receptor. Therefore, the Project's contribution to cumulative impacts related to CO hotspots would be less than significant.

## 4.3 Project-Level Greenhouse Gas Impacts

| | |
|---|---|
| **Threshold 1:** | Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? |
| **Threshold 2:** | Would the project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases? |

**Impact GHG-1 CONSTRUCTION, OPERATION, AND DECOMMISSIONING OF THE PROJECTS WOULD DIRECTLY AND INDIRECTLY GENERATE GHG EMISSIONS. CONSTRUCTION, OPERATION, AND DECOMMISSIONING OF THE PROJECTS WOULD BE CONSISTENT WITH APPLICABLE PLANS, POLICIES, AND REGULATIONS ADOPTED FOR THE PURPOSE OF REDUCING GHG EMISSIONS. IMPACTS WOULD BE LESS THAN SIGNIFICANT.**

### Emissions Quantifications

#### *Construction and Decommissioning Emissions*

Project-related construction and decommissioning emissions are confined to a relatively short period in relation to the overall life of the Project. Construction-related and decommissioning-related GHG emissions were quantified for informational purposes. Table 18 shows that Project construction would result in a total of approximately ~~96,308~~75,498 MT $CO_2e$ for the 36-Month construction period and ~~80,056~~62,440 MT $CO_2e$ for the 18-Month construction period. Decommissioning is conservatively assumed to be equal to construction emissions. However, this assumption is conservative as it is assumed additional carbon neutral technologies for construction equipment used in decommissioning will be implemented within the project lifespan. Emissions were then amortized over the lifetime of the Project (i.e., 35 years). As shown in Table 18, amortized construction emissions would be 2,~~752~~ 157 MT $CO_2e$ per year for the 36-Month construction period and ~~2,287~~1,784 MT $CO_2e$ per year for the 18-Month construction period. Amortized decommissioning emissions would be consistent with the amortized construction emissions.

### Table 18 Estimated Construction GHG Emissions

| Construction Phase | Project Emissions (MT $CO_2e$) 36-Month Schedule | 18-Month Schedule |
|---|---|---|
| **Solar Facility, Substation and Gen-Tie** | | |
| Phase 1: Site Prep | 5,459 | 5,251 |
| Phase 2: PV Panel | 45,270 | 30,716 |
| Phase 3: Inverters etc. | 11,074 | 11,069 |
| Phase 4: Gen-Tie | 3,081 | 3,536 |
| **Subtotal** | **64,884** | **50,572** |
| BESS Facility (Phase 5) | 3,987 | 5,203 |
| ~~Green Hydrogen Facility (Phase 6)~~ | ~~20,810~~0 | ~~17,616~~0 |
| Utility Switchyard (Phase 7) | 6,627 | 6,665 |
| Overall Project | ~~96,308~~75,498 | ~~80,056~~62,440 |
| **Amortized (35 years)** | **2,~~752~~157** | **~~2,287~~1,784** |

| Construction Phase | Project Emissions ($MT\ CO_2e$) | |
|---|---|---|
| | 36-Month Schedule | 18-Month Schedule |

NA = Not applicable. Phases may or may not be active during a given year based on the provided construction schedule.
MT = metric tons
$CO_2e$ = carbon dioxide equivalents
Source: Appendix N-2.

### *Operational Emissions*

The Project would generate GHG emissions during operation from minimal area source, energy consumption and mobile emissions.[8] Operation-related GHG emissions were quantified for informational purposes and are shown in Table 19. As shown in Table 19, the Project would generate approximately 20,~~824~~ 625 MT of $CO_2e$ per year from operation of the solar facility, gen-tie, utility switchyard, ~~and Options 1 or 2~~ step-up substation and BESS. ~~If the Project included the Option 1 or 2 green hydrogen facility, it would generate 142,342 MT of $CO_2e$ per year and if the Project included the alternate green hydrogen facility, it would generate 144,352 MT of $CO_2e$ per year.~~ With the inclusion of amortized construction and decommissioning emissions, the Project ~~with the Options 1 or 2 green hydrogen facility~~ would result in approximately ~~168,469~~24,939 MT of $CO_2e$ per year with a 36-Month construction and decommissioning schedule and ~~167,541~~24,193 MT of $CO_2e$ per year with an 18-Month construction and decommissioning schedule. ~~With the inclusion of amortized construction and decommissioning emissions, the Project with the alternate green hydrogen facility would result in approximately 170,480 MT of $CO_2e$ per year with a 36-Month construction and decommissioning schedule and 169,552 MT of $CO_2e$ per year with an 18-Month construction and decommissioning schedule.~~

Although the Project would emit a total between ~~167,541~~24,193 MT $CO_2e$ and ~~170,480~~24,939 MT $CO_2e$ per year, the Project could offset GHG emissions by replacing fossil-fueled power plants and fossil-fuel powered vehicle use. Based on the Project's anticipated annual electricity generation and the GHG emissions generated due to fossil-fuel combustion to generate the same level of electricity only, the Project has the potential to displace ~~504,499~~457,643 MT $CO_2e$ per year; conservatively~~, this estimate of displaced GHG emissions does not include the potential to displace GHG emissions from fossil-fuel powered vehicle use anticipated through the use of the green hydrogen~~. The net generation of annual GHG emissions would be between -~~334,019~~-432,704 MT $CO_2e$, and ~~-336,958~~-433,451 MT $CO_2e$ in the first year as shown in Table 19.[9] As the amount of renewable energy in California increases towards 100 percent, the annual offset of the project will decrease to 0, leaving the project at a status of net zero for GHG emissions. As such, the project would be consistent with state GHG reduction plans such as SB 32. Further, the Project could result in an overall lifetime reduction of between 4,113,714 MT $CO_2e$ and ~~approximately~~ ~~17~~16,~~657,465~~017,506 MT $CO_2e$ and would therefore be regionally beneficial.[10]

[8] Area sources for this project refer to consumer products (such as aerosol cleaners), and architectural coating (maintenance re-coating activities for battery storage).
[9] 24,939 MT $CO_2e$ -~~504,499~~457,463 MT $CO_2e$ ~~– 170,480 MT $CO_2e$~~ = -~~334,019~~457,643 MT $CO_2e$; ~~504,499~~24,193 MT $CO_2e$ – ~~167,541~~457,643 MT $CO_2e$ = -~~336,958~~433,451 MT $CO_2e$
[10] ~~504,499~~457,643 MT $CO_2e$ * 35 years = ~~17,657,465~~16,017,506 MT $CO_2e$ over the lifetime of the project assuming a static renewable percentage from 2023 over the 35 years. The 4,113,714 assumes a steady decrease in non-renewable resources across the board. Based on the 2023 power mix, approximately 7,248 MT CO2e is associated with each percentage of non-renewable energy included in the CA Power Mix. This value takes into account the type of non-renewable energy and the emissions per type. As it is unknown how the non-renewable energy systems will be removed from the CA Power Mix, the 7,248 MT CO2e per percentage was used to estimate the annual reduction in offset based on the increase in renewable energy per year needed to meet the 2045 goal of 100 percent renewable energy production within California. -

### Table 19 Annual GHG Emissions

| Construction Phase | Project Emissions MT $CO_2e$ 36-Month Schedule | Project Emissions MT $CO_2e$ 18-Month Schedule |
|---|---|---|
| **Solar Facility, Step-Up Substation and BESS (Option~~s~~ 1 ~~and 2~~), and Gen-Tie, and Utility Switchyard** | | |
| Road and Fence Repair | 30 | 30 |
| Road Reconditioning | 130 | 130 |
| Solar Panel Washing | 124 | 124 |
| Vegetation and Pest Management | 536 | 536 |
| O&M Facility | 47 | 47 |
| BESS - Battery Cooling | 17,415 | 17,415 |
| SF6 - Step-up Substation | 1,506 | 1,506 |
| SF6 - Utility Switchyard | 837 | 837 |
| **Subtotal** | 20,625 | 20,625 |
| ~~**Green Hydrogen Facility (Options 1 and 2)**~~ | | |
| ~~Green Hydrogen O&M~~ | ~~142,342~~ | ~~142,342~~ |
| **Construction and Decommissioning** | | |
| Amortized Construction | ~~2,752~~2,157 | ~~2,28~~1,784~~7~~ |
| Amortized Decommissioning | 2,157~~2,752~~ | 1,784~~2,287~~ |
| **Combined Operational, Construction and Decommissioning with Option~~s~~ 1 ~~and 2 Green Hydrogen Facility~~** | | |
| Solar Facility, Step-Up Substation and BESS (Option~~s~~ 1 ~~and 2~~), and Gen-Tie, and Utility Switchyard | 20,625 | 20,625 |
| ~~Green Hydrogen Facility Site (Options 1 and 2)~~ | ~~142,342~~ | ~~142,342~~ |
| Construction & Decommissioning | ~~5,504~~4,314 | ~~4,574~~3,568 |
| **Total Operational, Construction, and Decommissioning ~~with Options 1 or 2 Green Hydrogen Facility Site~~** | **~~168,469~~24,939** | **~~67,541~~24,193** |
| **Annual Displaced Emissions** | **~~504,49~~457,6439** | **~~4,499~~457,643** |
| **Net Project Emissions** | **(~~336,029~~432,704)** | **~~5,958~~433,451~~)~~** |
| ~~**Alternate Green Hydrogen Facility**~~ | | |
| ~~Green Hydrogen O&M~~ | ~~142,342~~ | ~~142,342~~ |
| ~~Alternate Green Hydrogen Facility Building~~ | ~~2~~ | ~~2~~ |
| ~~Alternate Green Hydrogen Substation ($SF_6$)~~ | ~~1,506~~ | ~~1,506~~ |
| ~~Alternate Green Hydrogen Switchyard ($SF_6$)~~ | ~~502~~ | ~~502~~ |
| ~~**Subtotal**~~ | ~~144,352~~ | ~~144,352~~ |
| ~~**Combined Operational, Construction, and Decommissioning with Alternate Green Hydrogen Facility**~~ | | |
| ~~Solar Facility, Step-Up Substation and BESS (Options 1 and 2), and Gen-Tie, and Utility Switchyard~~ | ~~20,625~~ | ~~20,625~~ |
| ~~Total Alternate Green Hydrogen Facility~~ | ~~144,352~~ | ~~144,352~~ |
| ~~Construction & Decommissioning~~ | ~~5,504~~ | ~~4,574~~ |

| Construction Phase | Project Emissions MT $CO_2e$ 36-Month Schedule | 18-Month Schedule |
|---|---|---|
| ~~Total Operational, Construction, and Decommissioning with Alternate Green Hydrogen Facility Site~~ | ~~170,480~~ | ~~169,552~~ |
| ~~**Annual Displaced Emissions**~~ | ~~**504,499**~~ | ~~**504,499**~~ |
| ~~**Net Project Emissions**~~ | ~~**(334,019)**~~ | ~~**(334,947)**~~ |

Note: Parenthetical notation represents negative numbers.
$SF_6$ = Sulphur hexafluoride; MT = Metric Tons; $CO_2e$ = carbon dioxide equivalent
Source: Appendix N-2.

Approximately ~~6 to 8~~11 percent of total operational emissions are associated with the emissions of $SF_6$, which is a component in the circuit breakers of the project. The Project would include up to 14 high voltage circuit breakers to support substation (9 circuit breakers) and utility Switchyard (5 circuit breakers) associated with the operation of Option~~s~~ 1 ~~and 2~~ which would be implemented as the project is implemented. ~~If the alternative Green Hydrogen Facility Site is used, an additional 12 circuit breakers (3 for the alternate site switchyard, and 9 for the alternate site substation) would be used.~~ As detailed in the methodology section (Section 3.1), the use of $SF_6$ in electric utility systems and switchgear, including circuit breakers, poses a concern, because this pollutant has an extremely high global warming potential (one pound of $SF_6$ is the equivalent warming potential of approximately 24,600 pounds of $CO_2$). The circuit breakers used at the Project site would contain up to 1,500 pounds (lbs) of $SF_6$ each, for a total of ~~between~~ 21,000 lbs of $SF_6$ gas ~~and 39,000 lbs~~. Assuming $SF_6$ leakage would not exceed 1 percent annually, total annual $SF_6$ leakage would be ~~between~~ 210 lbs (0.10 MT) ~~and 390 lbs (0.18 MT)~~. Based on the global warming potential of $SF_6$, the circuit breakers would result in ~~up to between~~ 2,343 MT of $CO_2e$ ~~and 4,352 MT of $CO_2e$~~ emissions, annually.

In compliance with CARB regulations, the Applicant would be required to regularly inventory gas-insulated switchgear equipment, measure quantities of $SF_6$ and submit an annual report to CARB. In addition, the analysis assumed that all circuit breakers would contain $SF_6$ as a conservative analysis. As discussed in the regulatory section, CARB has implemented phasing requirements for the elimination of $SF_6$ from electrical equipment, including circuit breakers. While the analysis assumes that all circuit breakers would contain $SF_6$, it is possible that circuit breakers in the later phases may not contain $SF_6$ and/or as circuit breakers are replaced they would be replaced with non-$SF_6$ technology. Additionally, as discussed in the methodology section, the analysis assumed the maximum amount of $SF_6$ per circuit breaker and depending on the circuit breaker actually used, $SF_6$ content may be substantially less than assumed in the analysis. Therefore, GHG emissions reported for the Project are conservative.

The Project would address the limitations of the electric grid and the increasing demand for renewable energy by increasing storage capability which improves the reliability of the grid and makes it more resilient to disturbances and peaks in energy demand. As the use of renewable energy increases, the need for battery storage to maintain electrical supply during both peak demand and when the renewable systems are not generating electricity also increases. It is anticipated that the reduction in GHG emissions from non-renewable electricity generating facilities would more than offset the annual GHG emissions anticipated from the Project, as more renewable energy facilities come online and non-renewable electricity generating facilities are taken offline. It is unknown how much growth in future demand would require the continuation of the use of the existing fossil fuel generation system even with the operation of energy storage systems. However, the project would eliminate the need to create new non-renewable energy generation sources to accommodate future energy demand. Therefore, the project is anticipated to result in a net benefit and overall reduction with respect to GHG emissions as shown in Table 19.

### Plan Consistency

*2022 Scoping Plan*

The principal state GHG reduction plans and policies are AB 32, the California Global Warming Solutions Act of 2006, and the subsequent legislation, SB 32 and AB 1279. The goal of SB 32 is to reduce GHG emissions to 40 percent below 1990 levels by 2030. In 2022, the State passed AB 1279, which declares the State would achieve net-zero GHG emissions by 2045 and would reduce GHG emissions by 85 percent below 1990 levels by 2045. The latest iteration of the Scoping Plan is the 2022 Scoping Plan, which focuses on outcomes needed to achieve carbon neutrality by assessing paths for clean technology, energy deployment, natural and working lands, and others, and is designed to meet the state's long-term climate objectives and support a range of economic, environmental, energy security, environmental justice, and public health priorities. The 2022 Scoping Plan's strategies that apply to the proposed project include the following:

- Reducing fossil fuel use, energy demand and vehicle miles traveled (VMT);
- Building decarbonization; and
- Maximizing recycling and diversion from landfills

The proposed project would be consistent with these goals by reducing fossil fuel use by generating renewable energy ~~and producing green hydrogen~~, as well as through the implementation of the BESS facility that would store electrical energy for additional grid support during peak demand. In addition, the proposed building structures would not incorporate natural gas or propane, and the majority of the Project's electrical needs would be offset by the Project's operations. The Project's utility switchyard would be run by PG&E and would enhance the capacity of the transmission system and allow for the delivery of wholesale renewable electricity to the statewide grid. The Project would generate solar energy that would supplement PG&E's requirement to increase its renewable energy procurement in accordance with SB 100 targets. Therefore, the proposed project would not conflict with the 2022 Scoping Plan and GHG impacts would be less than significant.

## 4.4 Cumulative Greenhouse Gas Impacts

The geographic scope for related projects considered in the cumulative impact analysis for GHG emissions is global because impacts of climate change are experienced on a global scale regardless of the location of GHG emission sources. As discussed in Section 8.9.1 of the *GAMAQI*, GHG emissions and climate change are, by definition, cumulative impacts. Thus, the issue of climate change involves an analysis of whether a project's contribution towards an impact is cumulatively considerable. As discussed under Impact GHG-1, Project impacts related to GHG emissions would be less than significant since the Project would be consistent with the state plans for reducing GHG emissions. Therefore, the Project's contribution to cumulative GHG impacts would be less than significant.

# 5 References


California Air Pollution Control Officers Association. 2022. California Emissions Estimator Model User Guide: Version 2022.1. Prepared by ICF in collaboration with Sacramento Metropolitan Air Quality Management District, Fehr & Peers, STI, and Ramboll. April 2022. https://www.caleemod.com/documents/user-guide/CalEEMod_User_Guide_v2022.1.pdf (accessed January 2023).

California Air Resources Board (CARB). 2005. Air Quality and Land Use Handbook: A Community Health Perspective. http://www.aqmd.gov/docs/default-source/ceqa/handbook/california-air-resources-board-air-quality-and-land-use-handbook-a-community-health-perspective.pdf (accessed September 2023).

______. 2007. Resolution No. 07-103106. October 31, 2007.

______. 2008. Climate Change Scoping Plan. https://ww2.arb.ca.gov/sites/default/files/classic/cc/scopingplan/document/adopted_scoping_plan.pdf (accessed September 2023).

______. 2014. First Update to the Climate Change Scoping Plan. May. https://ww2.arb.ca.gov/sites/default/files/classic/cc/scopingplan/2013_update/first_update_climate_change_scoping_plan.pdf (accessed July 2021).

______. 2017. California's 2017 Climate Change Scoping Plan. December 14, 2017. https://www.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf (accessed July 2021).

______. 2018a. SB 375 Regional Plan Climate Targets. https://ww2.arb.ca.gov/our-work/programs/sustainable-communities-program/regional-plan-targets (accessed September 2023).

______. 2018b. 2020 Business-as-Usual (BAU) Emissions Projection – 2014 Edition. Last modified: June 22, 2018. www.arb.ca.gov/cc/inventory/data/bau.htm (accessed October 2018).

______. 2022a. Inhalable Particulate Matter and Health (PM2.5 and PM10). https://ww2.arb.ca.gov/resources/inhalable-particulate-matter-and-health (accessed September 2023).

______. 2022b. Overview: Diesel Exhaust & Health. https://ww2.arb.ca.gov/resources/overview-diesel-exhaust-and-health (accessed September 2023).

______. 2022c. 2022 Scoping Plan for Achieving Carbon Neutrality. November 16, 2022. https://ww2.arb.ca.gov/sites/default/files/2022-12/2022-sp_1.pdf (accessed September 2023).

______. 2023. iADAM: Air Quality Data Statistics Top 4 Summary. N.d. https://www.arb.ca.gov/adam/topfour/topfour1.php (accessed September 2023).

California Climate Change Center (CCCC). 2006. Climate Scenarios for California.

California Department of Public Health. 2021. Valley Fever Fact Sheet. Last Updated June 2021. https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/ValleyFeverFactSheet.pdf (accessed June 2023).

______. 2023. Coccidioidomycosis in California Provisional Monthly Report January-April 2023. April. https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/CocciinCAProvisionalMonthlyReport.pdf (accessed June 2023).

California Department of Water Resources. 2018. Indicators of Climate Change in California. May 2018. https://oehha.ca.gov/media/downloads/climate-change/report/2018caindicatorsreportmay2018.pdf (accessed August 2021).

California Department of Food and Agriculture. 2020. "California Agricultural Production Statistics." https://www.cdfa.ca.gov/statistics/ (accessed July 2021).

California Natural Resources Agency. 2009. 2009 California Climate Adaptation Strategy. March 2009. http://resources.ca.gov/docs/climate/Statewide_Adaptation_Strategy.pdf (accessed July 2021).

Fresno, County of. 2000. Fresno County General Plan Policy Document. October 3, 2000. https://www.fresnocountyca.gov/files/sharedassets/county/v/1/vision-files/files/18117-2000-general-plan-policy-document.pdf (accessed September 2023).

______. 2012. *County of Fresno Government Operations Greenhouse Gas Emissions Inventory, 2010 Baseline Year Narrative Report*. December 2012.

______. 2023. Public Health. https://www.fresnocountyca.gov/Departments/Public-Health (accessed September 2023).

Fresno Council of Governments (FCOG). 2018. Regional Transportation Plan Sustainable Communities Strategy 2018-2042. https://fresnocog.wpenginepowered.com/wp-content/uploads/2017/02/2018-RTP-Cover-Intro-table-of-contents-etc.Final-Draft.pdf (accessed September 2023).

Intergovernmental Panel on Climate Change (IPCC). 2018. Summary for Policymakers. In: Global warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty. https://www.ipcc.ch/sr15/ (accessed July 2021).

______. 2021a. Climate Change 2021 The Physical Science Basis. August. https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Full_Report.pdf (accessed August 2021).

______. 2021b. The Earth's Energy Budget, Climate Feedbacks and Climate Sensitivity Supplementary Material. https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Chapter07_SM.pdf (accessed September 2023).

______. 2023. Climate Change 2023 Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change, Core Writing Team, H. Lee and J. Romero (eds.), Geneva, Switzerland. https://www.ipcc.ch/report/ar6/syr/downloads/report/IPCC_AR6_SYR_FullVolume.pdf (accessed September 2023).

Kirkland and Fierey. 1996. Coccidioidomycosis: A Reemerging Infectious Disease. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2626789/ (accessed June 2023).

Los Angeles County Health Department. 2013. Preventing Work-Related Coccidioidomycosis (Valley Fever). June. http://publichealth.lacounty.gov/acd/docs/ValleyFeverPreventionforWorkFlyer.pdf (accessed June 2023).

National Oceanic and Atmospheric Administration. 2020. "Global Climate Report for Annual 2019." State of the Climate. January 2020. https://www.ncdc.noaa.gov/sotc/global/201813 (accessed September 2023).

Office of Environmental Health Hazard Assessment (OEHHA). 2015. Air Toxics Hot Spots Program Risk Assessment Guidelines - The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments. February. https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf (accessed August 2021).

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2004. Rule 8021 Construction, Demolition, Excavation, Extraction, and Other Earthmoving Activities. Adopted November 15, 2001, Amended August 19, 2004. www.valleyair.org/rules/currntrules/r8021.pdf (accessed July 2021).

______. 2007a. 2007 Ozone Plan. Adopted June 14, 2007. http://www.valleyair.org/Air_Quality_Plans/docs/AQ_Ozone_2007_Adopted/2007_8HourOzone_CompletePlan.pdf (accessed July 2021).

______. 2007b. 2007 $PM_{10}$ Maintenance Plan and Request for Redesignation. September. http://www.valleyair.org/Air_Quality_Plans/docs/Maintenance%20Plan10-25-07.pdf (accessed July 2021).

______. 2008a. 2018 $PM_{2.5}$ Plan. April. http://www.valleyair.org/Air_Quality_Plans/AQ_Final_Adopted_PM25_2008.htm (accessed July 2021).

______.2008b. Climate Change Action Plan. https://www.valleyair.org/Programs/CCAP/CAPP%20Staff%20Report%202008Nov12.pdf (accessed November 2008).

______. 2009a. 2009 Reasonably Available Control Technology (RACT) Demonstration for Ozone State Implementation Plans (SIP). April 16, 2009. http://valleyair.org/Air_Quality_Plans/docs/RACTSIP-2009.pdf (accessed July 2021).

______. 2009b. Guidance for Valley Land-Use Agencies in Addressing GHG Emission Impacts for New Projects Under CEQA. December. http://www.valleyair.org/Programs/CCAP/12-17-09/3%20CCAP%20-%20FINAL%20LU%20Guidance%20-%20Dec%2017%202009.pdf (accessed July 2021).

______.2009c. Final Staff Report Addressing Greenhouse Gas Emissions Impacts Under the California Environmental Quality Act. December. https://www.valleyair.org/Programs/CCAP/12-17-09/1%20CCAP%20-%20FINAL%20CEQA%20GHG%20Staff%20Report%20-%20Dec%2017%202009.pdf (accessed July 2021).

______. Procedure for Determining NO2 Monitor Background Values (Design Values) for use in Calculating NAAQS Compliance. http://www.valleyair.org/busind/pto/tox_resources/airqualitymonitoring.htm#modeling_guidance (accessed September 2023).

______. 2012. 2012 $PM_{2.5}$ Plan. Adopted December 20, 2012. http://www.valleyair.org/Air_Quality_Plans/PM25Plan2012/CompletedPlanbookmarked.pdf (accessed July 2021).

______. 2013a. 2013 Plan for the Revoked 1-Hour Ozone Standard. September 19, 2013. http://valleyair.org/Air_Quality_Plans/OzoneOneHourPlan2013/AdoptedPlan.pdf (accessed July 2021).

______. 2013b. Rule 4702 Internal Combustion Engine. Adopted August 21, 2003, Amended November 14, 2013. https://www.valleyair.org/rules/currntrules/R4702_Clean.pdf (accessed August 2021).

______. 2014. 2014 Reasonably Available Control Technology (RACT) Demonstration for the 8-Hour Ozone State Implementation Plan (SIP). June 19, 2014. http://valleyair.org/Air_Quality_Plans/docs/2014-RACT-SIP.PDF (accessed July 2021).

______. 2015a. *Guide for Assessing and Mitigating Air Quality Impacts*, March 19, 2015. www.valleyair.org/transportation/GAMAQI_3-19-15.pdf (accessed July 2021).

______. 2015b. San Joaquin Valley Air Pollution Control District 2015 Annual Report, Indirect Source Review Program, Reporting Period: July 1, 2014 to June 30, 2015. December 17, 2015. www.valleyair.org/isr/Documents/2015-ISR-Annual-Report.pdf (accessed July 2021).

______. 2015c. 2015 Plan for the 1997 $PM_{2.5}$ Standard. Adopted April 2015. www.valleyair.org/Air_Quality_Plans/docs/PM25-2015/2015-PM2.5-Plan_Bookmarked.pdf (accessed July 2021).

______. 2015d. Update to District's Risk Management Policy to Address OEHHA's Revised Risk Assessment Guidance Document Final Staff Report. http://valleyair.org/busind/pto/staff-report-5-28-15.pdf (accessed September 2023).

______. 2016. 2016 Moderate Area Plan for the 2012 $PM_{2.5}$ Standard. Adopted September 15, 2016. www.valleyair.org/Air_Quality_Plans/docs/PM25-2016/2016-Plan.pdf (accessed July 2021).

______. 2017. Rule 9510 (Indirect Source Review). December 15, 2005. Amended December 21, 2017, but not in effect until March 21, 2018. www.valleyair.org/rules/currntrules/r9510.pdf (accessed July 2021).

______. 2018. 2018 Plan for the 1997, 2006, and 2012 $PM_{2.5}$ Standards. Adopted November 15, 2018. http://www.valleyair.org/pmplans/documents/2018/pm-plan-adopted/2018-Plan-for-the-1997-2006-and-2012-PM2.5-Standards.pdf (accessed July 2021).

______. 2019. PR 1924 Policy for District Rule 2201 AAQA Modeling. http://www.valleyair.org/policies_per/Policies/APR-1925.pdf (accessed September 2023).

______. 2020. 2020 Reasonably Available Control Technology (RACT) Demonstration for the 2015 8-Hour Ozone Standard. Adopted June 18, 2020. http://valleyair.org/Air_Quality_Plans/docs/2020-RACT-Demonstration.pdf (accessed July 2021).

______. 2022a. Ambient Air Quality Standards & Valley Attainment Status. https://www.valleyair.org/aqinfo/attainment.htm (accessed September 2023).

______. 2022b. 2022 Plan for the 2015 8-Hour Ozone Standard. December 15, 2022. https://ww2.valleyair.org/media/q55posm0/0000-2022-plan-for-the-2015-8-hour-ozone-standard.pdf (accessed September 2023).

______. 2022c. Guidance for Air Dispersion Modeling. September 2022. http://www.valleyair.org/busind/pto/tox_resources/Modeling_Guidance.pdf (accessed September 2023).

______. 2023. Proposed 2023 Maintenance Plan and Redesignation Request for the Revoked 1-Hour Ozone Standard. May 16, 2023. https://www.valleyair.org/Workshops/postings/2023/06-15-23/maintenance-plan.pdf (accessed September 2023).

Sierra Club v. EPA, 671 F.3d 955 *Sierra Club v. United States Environmental Protection Agency*, 671 F.3d 955 (9th Cir. 2012) https://www.courtlistener.com/opinion/621235/sierra-club-v-usepa/? (accessed September 2023).

United States Environmental Protection Agency (USEPA). 2008. Redesignation of the San Joaquin Valley SJVAB PM-10 Nonattainment Area to Attainment. Federal Register. November 12, 2008. www.federalregister.gov/documents/2008/11/12/E8-26500/approval-and-promulgation-of-implementation-plans-designation-of-areas-for-air-quality-planning (accessed September 2023).

____. 2013. Policy Assessment for the Review of the Lead National Ambient Air Quality Standards, External Review Draft. https://www3.epa.gov/ttn/naaqs/standards/pb/data/010913_pb-draft-pa.pdf (accessed July 2021).

_____. 2017. Revisions to the Guideline on Air Quality Models: Enhancements to the AERMOD Dispersion Modeling System and Incorporation of Approaches to Address Ozone and Fine Particulate Matter. January 2017. Vol. 82, No. 10. https://www.federalregister.gov/documents/2017/01/17/2016-31747/revisions-to-the-guideline-on-air-quality-models-enhancements-to-the-aermod-dispersion-modeling (accessed September 2023).

____. 2021a. “Criteria Air Pollutants.” https://www.epa.gov/criteria-air-pollutants (accessed July 2021).

______. 2022. NAAQS Designations Process. https://www.epa.gov/criteria-air-pollutants/naaqs-designations-process#:~:text=If%20the%20air%20quality%20in%20a%20geographic%20area,meet%20the%20national%20standard%20are%20called%20nonattainment%20areas (accessed September 2023).

______. 2023a. “Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2019.” Last updated: January 25, 2023. https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2019 (accessed September 2023).

______. 2023b. “Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act.” Last updated: April 4, 2023. https://www.epa.gov/climate-change/endangerment-and-cause-or-contribute-findings-greenhouse-gases-under-section-202a (accessed September 2023).

# Appendix N-1

Assumptions

# Appendix N-2

Calculations

# Appendix N-3

CalEEMod Output

# Appendix N-4

HRA Summary

# Appendix N-5

HARP Output

# Appendix N-6

AERMOD Output

# Appendix N-7

AAQA Summary

# Appendix D - Clean

SUP DR AQ-7 Updated Appendix N

# Darden Clean Energy Project

## Air Quality and Greenhouse Gas Emissions Study

*prepared for*

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RINCON CONSULTANTS, INC. SINCE 1994

# Table of Contents



## Tables

## Figures



## Appendices

# 1 Project Description

## 1.1 Introduction

This study analyzes the air quality and greenhouse gas (GHG) emissions impacts of the proposed Darden Clean Energy Project (Project) in unincorporated Fresno County, California. Rincon Consultants, Inc. (Rincon) prepared this study under contract to IP Darden I, LLC and Affiliates (Applicant), wholly owned subsidiaries of Intersect Power, LLC for use in support of California Environmental Quality Act (CEQA) compliance for the Project and the study adheres to the California Energy Commission (CEC) requirements for Opt-In Applications (Title 20, California Code of Regulations [CCR], Section 1704, Appendix B). The purpose of this study is to analyze the Project's air quality and GHG impacts related to both temporary construction activity and long-term operation of the Project. Table 1 provides a summary of potential Project impacts.

**Table 1 Summary of Impacts**

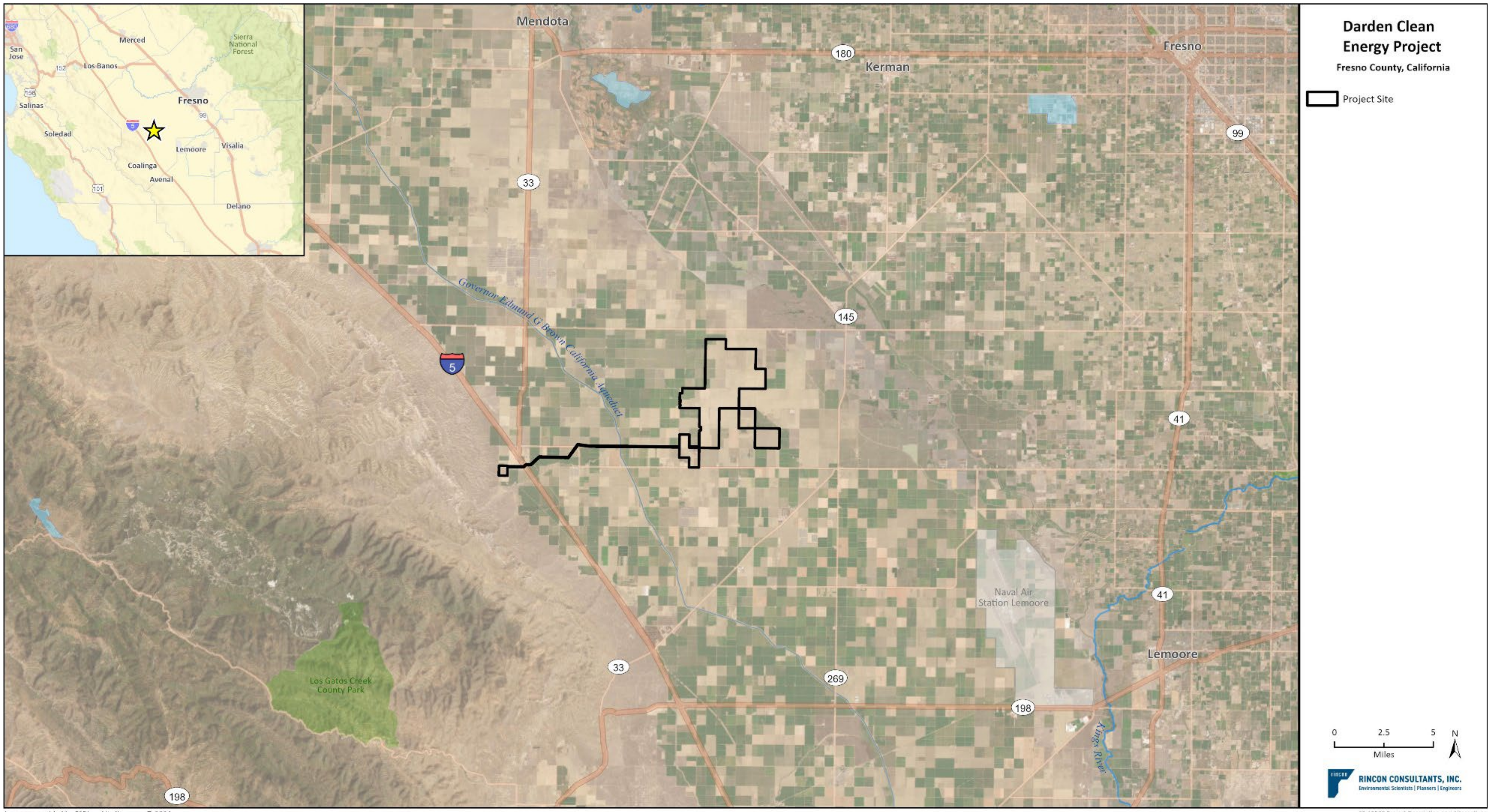
| Impact Statement | Proposed Project's Level of Significance | Mitigation |
|---|---|---|
| **Air Quality** | | |
| Conflict with or obstruct implementation of the applicable air quality plan? | Potentially significant impact | Less than significant with mitigation (AQ-1 & AQ2) |
| Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard? | Potentially significant impact | Less than significant with mitigation (AQ-1 &AQ-2) |
| Expose sensitive receptors to substantial pollutant concentrations? | Potentially significant impact | Less than Significant with Mitigation (AQ-3) |
| Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people? | Less than significant impact | None |
| **Greenhouse Gas Emissions** | | |
| Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? | Less than significant impact | None |
| Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases? | No impact | None |

## 1.2 Project Location

The Project site is an irregular shape, located in an agricultural area of unincorporated Fresno County south of the community of Cantua Creek (Figure 1). The proposed solar facility, BESS, and step-up substation sites would be located on approximately 9,100 acres of land currently owned by Westlands Water District, between South Sonoma Avenue to the west and South Butte Avenue to the east. The proposed approximately 15-mile gen-tie line would span west from the intersection of South Sonoma Avenue and West Harlan Avenue to immediately west of Interstate 5 (I-5), where it would connect to the proposed utility switchyard along Pacific Gas and Electric Company (PG&E)'s Los Banos-Midway #2 500-kV transmission line (Figure 2).

Land cover types are predominantly retired agricultural lands that have been irregularly farmed over the last 10 years and seasonally or annually disked when not growing crops, and associated dirt roads, field and road shoulders, basins, ditches, and berms. Some active farming occurred in limited areas on the Project site during 2023. Surrounding properties include retired and active agricultural lands. The gen-tie line spans privately-owned land on the western portion of the Project site with land-cover types including active agriculture. The California Aqueduct bisects the gen-tie parcels, running generally north-south. Compacted dirt and paved roads border and separate each land-cover type.

**Figure 1 Regional Location**

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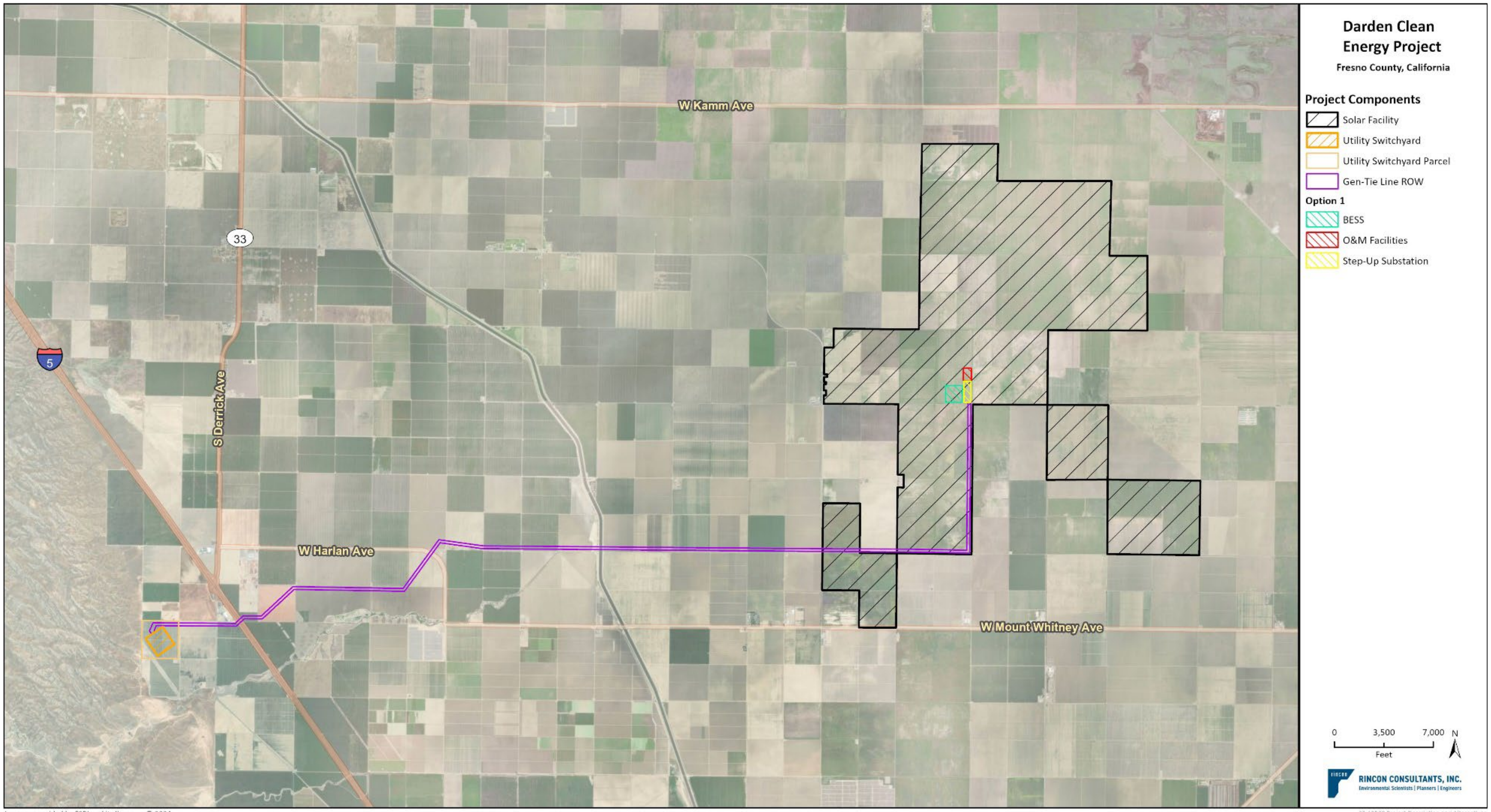
## Figure 2 Project Site

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# 1.3 Project Description

The Project consists of the construction, operation, and eventual repowering or decommissioning of a 1,150-megawatt (MW) solar photovoltaic (PV) facility, an up to 4,600-megawatt-hour (MWh) battery energy storage system (BESS), a 34.5-500-kilovolt (kV) grid step-up substation, a 15-mile 500 kV generation intertie (gen-tie) line, a 500-kV utility switchyard along the PG&E Los Banos-Midway #2 500-kV transmission line, and appurtenances.

Project construction is anticipated to take between 18 to 36 months to complete and the Project would be operational by 2027 or 2028. The Project would include the following major components:

- **Solar Facility, Step-Up Substation, and Gen-tie**
  - Construct a 1,150 MW solar PV facility, consisting of approximately 3,100,000 solar panels, inverter-transformer stations, and an electrical collection system. The collection cables would be buried underground in a trench about 4-feet deep, with segments installed overhead on wood poles to connect all of the solar facility development areas to the on-site step-up substation.
  - Construct a new step-up substation to step-up the medium voltage of the PV collector system from 34.5 kV to 500 kV, located on approximately 20 acres.
  - Construct operations and maintenance facilities.
  - Construct an approximately 15-mile 500-kV, gen-tie line, consisting of either monopole tubular steel poles of steel H-frame structures and dead-end structures, to interconnect the step-up substation to the new utility switchyard. The gen-tie line would be located within an up to 275-foot-wide corridor.
- **BESS**
  - Construct a battery storage system capable of storing up to 1,150 MW of electricity for four hours (up to 4,600 MWh), located on approximately 35 acres.
- **Utility Switchyard**
  - Construct a PG&E-owned switchyard, consisting of high-voltage circuit breakers, switches, and series capacitor line compensation equipment in a breaker-and-half configuration, to electrically connect the Project’s generation onto PG&E’s 500-kV transmission network. The utility switchyard would be located on approximately 50 acres.

The Project would operate for approximately 35 years, at which time Project facilities would be either repowered or decommissioned. Following decommissioning, the Project site would be restored and reclaimed to the extent practicable to pre-construction conditions consistent with site lease agreements.

The Project previously included construction of an up to 1,150-MW green hydrogen generator which has since been removed from the Project. The analysis includes the construction and operation of the green hydrogen facility; therefore, it is mentioned here for clarification and informational purposes. The emissions presented herein are inclusive of the green hydrogen facility and are considered conservative.

## Solar Facility

### *Photovoltaic Panels and Support Structures*

The solar facility would utilize either mono-facial or bi-facial panels, which would be mounted in a portrait orientation as single panels or mounted in a landscape orientation and stacked two high on a north-south oriented single-axis tracking system that would track the sun from east to west during the day. Panels would be arranged in strings with a maximum height of 10 feet at full tilt or slightly higher due to topography or hydrology. The single axis tracking system would be oriented along a north/south axis with panels facing east in the early morning, lying flat during high noon, and facing west during later afternoon and evening hours. Spacing between each row would be a minimum of 10 feet. The solar panel array would generate electricity directly from sunlight, which would be collected, converted to alternating current (AC), stored, and delivered to the on-site step-up substation. Structures supporting the PV panels would consist of steel piles (e.g., cylindrical pipes, H-beams, helical screws, or similar structures). The piles typically would be spaced 18-feet apart. For the tracking system, piles would be installed to a height of approximately 4- to 6-feet above grade (minimum 1 foot between bottom edge of panel and ground but could be higher to compensate for terrain variations and clearance for overland flow during stormwater events ).

### *Inverters, Transformers, and Electrical Collection System*

The solar facility would be designed and laid out primarily in sub-arrays installed in rows, ranging in capacity from 4 to 7 MW. Each sub-array would include a direct current (DC) to AC inverter and medium voltage transformer equipment area (i.e., inverter-transformer station) measuring 40 feet by 25 feet. As necessary, sub-arrays would be designed and sized as appropriate to accommodate the irregular shape of the Project site. The precise sub-array dimensions and configuration would be dependent on available technology and market conditions. Each sub-array would include an inverter-transformer station constructed on a concrete pad or steel skid centrally located within the surrounding PV sub-arrays of that block. Each inverter transformer station would contain an inverter, a transformer, a battery enclosure, and a switchboard. If required based on site meteorological conditions, an inverter shade structure would be installed at each pad. The shade structure would consist of wood or metal supports and a durable outdoor material shade structure (metal, vinyl, or similar). The shade structure, if utilized, would extend up to 10-feet above the ground surface.

Panels would be electrically connected into panel strings using wiring secured to the panel racking system. Underground cables would be installed to convey the DC electricity from the panels via combiner boxes or combiner harnesses with a trunk bus system located throughout the PV sub-arrays, to inverters that would convert the DC to AC electricity. The output voltage of the inverters would be stepped up to the required collection system voltage at the medium voltage pad mount transformer located in close proximity to the inverter. The 34.5-kV level collection cables would be buried underground in a trench about 4 feet deep, with segments installed overhead on wood poles to connect all of the solar facility development areas to the on-site step-up substation, which may or may not involve an overhead or underground road crossing. Thermal specifications require 10 feet of spacing between the medium voltage lines, and in some locations closer to the on-site step-up substation interconnection, more than 20 medium voltage AC lines run in parallel. In locations where the collection system crosses a road or pipelines overhead, direct embedded wood poles would be used on a case-by-case basis. Wood poles spaced up to 250-feet apart could be installed on the site. The typical height of the poles would be approximately 60 to 100 feet, with an embedment depth of 10 to 15 feet depending on the type of crossing, and diameters varying from 12 to 20 inches.

## Step-Up Substation

The step-up substation would step-up the medium voltage of the PV collector system from 34.5 kV to 500 kV. The step-up substation would be located on approximately 20 acres within the solar facility, as shown in Figure 2.

The step-up substation would terminate the medium voltage solar feeders to several common medium voltage busses and transform the power at these busses to the high voltage required for transmission on the gen-tie line to the utility switchyard.

The internal arrangements for the step-up substation would include:

- Eight power and auxiliary transformers with foundations
- Prefabricated control building(s) to enclose the protection and control equipment, including relays and low voltage switchgear (each building is approximately 20 feet by 80 feet, and 10 to 20 feet high)
- Metering stand
- Capacitor bank(s)
- Nine circuit breakers and disconnect switches
- Up to two microwave towers, approximately 18 feet by 18 feet and up to 200-feet tall, mounted with an antenna up to 15 feet in diameter
- Dead-end structure(s) up to 100 feet in height to connect the step-up substation to the grid

## Gen-Tie

The Project would include a 500-kV, gen-tie line to interconnect the step-up substation to the proposed utility switchyard and is anticipated to be approximately 15 miles long. The 500-kV, gen-tie line would be located within an up to 275-foot right-of-way, extending west from the solar facility across privately administered lands, across I-5, and into the proposed utility switchyard. The gen-tie line would be constructed with either monopole tubular steel poles (TSP) or steel H-frame strucutres. Gen-tie structures would be at least 120-feet tall, with a maximum height of 200 feet. There would be a total of approximately 80 monopole or H-frame structures, in addition to dead-end structures. The total number of gen-tie structures would be determined during final design engineering.

## BESS

The BESS would be capable of storing up to 1,150 MW of electricity for 4 hours (up to 4,600 MWh), requiring up to 35 acres that would be located near the step-up substation to facilitate interconnection and metering. The storage system would consist of battery banks housed in electrical enclosures and buried electrical conduit. Approximately 1,220 electrical enclosures measuring approximately 40 feet or 52 feet by 8 feet and 8.5 feet high would be installed on level foundations. The Project would use the Tesla Megapack 2 XL battery technology. Battery systems would require air conditioners or heat exchangers and inverters. In addition, a 15,000-gallon water tank is anticipated for each BESS unit/area.

## Utility Switchyard

One utility-owned switchyard, approximately 50 acres in size would serve as the facility required to electrically connect the Project generation onto the utility's 500-kV transmission network. As shown in Figure 2, the utility switchyard would be located on the west side of the Project and serve as a termination point for the Project gen-tie and will initially loop in the Los Banos-Midway #2 500-kV transmission line. The utility switchyard would contain approximately five (5) 500 kV circuit breakers and would be surrounded by a new security wall or chain link barbed wire security fence up to approximately 20-feet in height with a secure gate accessible only by PG&E staff.

Structural components within the utility switchyard area would include:

- One 199-foot-tall, free-standing digital microwave antenna (radio tower) to support Supervisory Control and Data Acquisition System communication between the switchyard and the off-site PG&E Operations Center
- Series capacitor banks (sizing to be determined by utility requirements)
- Approximately fifteen (15) 500-kV steel A-frame dead-end poles up to 150 feet in height with foundations approximately 20-feet deep or more
- Busbar (a conducting bar that carries heavy currents to supply several electric circuits)
- Two (2) modular protection automation and control (MPAC) enclosure(s) approximately 150 feet by 25 feet by 12-feet tall for PG&E's substation control and protection equipment. MPAC building will be installed on a concrete foundation
- Two (2) switchyard battery enclosure area(s) approximately 34-feet by 16-feet by 12-feet tall
- Five (5) 500 kV circuit breakers and air disconnect switches
- On-site stormwater retention pond (1,300 feet by 130 feet) for temporary run-off storage during rainfall events
- New security wall or chain link barbed wire security fence up to approximately 20-feet in height with a secure gate accessible only by PG&E staff

## 1.4 Construction Activities

Construction of all Project components would occur between 18 to 36 months, initiating in late 2025 or early 2026 with the facility placed into service by 2027 or 2028 depending on the construction schedule. Construction of the Project would include the following types of activities:

- Solar Facility, Step Up Substation, and Gen-tie
  - Phase 1: Site Preparation
  - Phase 2: PV Panel System
  - Phase 3: Inverters, Transformers, Substation, and Electrical
  - Phase 4: Gen-Tie
- BESS Facility (Phase 5)
- ~~Green Hydrogen Facility (Phase 6)~~
- Utility Switchyard (Phase 7)

All construction equipment would be rated United States Environmental Protection Agency (USEPA) Tier 4.

## 1.5 Operational Activities

Once completed, the Project would generally be limited to the following maintenance activities:

- Maintaining safe and reliable solar generation

- Site Security
- Responding to automated electrical alters based on monitored data, including actual versus expected tolerances for system output and other key performance metrics
- Communicating with customers, transmission system operators, and other entities involved in facility operations

The Project would operate continuously, seven days a week, until the anticipated repowering or decommissioning in 35 years. An average of 12 permanent staff associated with the solar facility would be on-site daily, with additional staff during intermittent solar panel washing (17 staff), facility maintenance and repairs (4 staff), and vegetation management activities (12 staff). Up to 4 average permanent staff associated with the BESS would be on-site daily. Alternatively, Project operators would be located off-site and would be on call to respond to alerts generated by the monitoring equipment at the Project site. Security personnel would be on-call. It is anticipated that permanent staff would be recruited from nearby communities in Fresno County. The operation and maintenance (O&M) building would house the security monitoring equipment, including security camera feeds for monitoring the Project 24 hours per day. Equipment repairs could take place in the early morning or evening when the facility would be producing the least amount of energy. Maintenance typically would include the following: Panel repairs; panel washing; maintenance of transformers, inverters, energy storage system, other electrical equipment; road and fence repairs; and vegetation and pest management. The Applicant would recondition roads approximately once per year, such as after a heavy storm event that may cause destabilization or erosion. Solar panels would be washed as needed (up to four times each year) using light utility vehicles with tow-behind water trailers to maintain optimal electricity production. No heavy equipment would be used during normal operation. O&M vehicles would include trucks (pickup and flatbed), forklifts, and loaders for routine and unscheduled maintenance and water trucks for solar panel washing. Large heavy-haul transport equipment may be brought to the solar facility infrequently for equipment repair or replacement. No helicopter use is proposed during routine operations although they may be used for emergency maintenance or repair activities.

## 1.6 Decommissioning Activities

The facility's equipment has a useful life of approximately 35 years. At that time, the Applicant would seek to either repower or decommission the facility. In order to repower, the facility would likely be optimized to increase the plant's efficiency by replacing inverters with more efficient units, and potentially replacing some of the facility's panels. Ground disturbing work would not be necessary for optimization activities. The Project would be offline for several weeks or months during optimization activities but would subsequently continue delivering electricity to the wholesale market for many decades.

Decommissioning activities would require similar equipment and workforce as construction but would be substantially less intense. The following activities would be involved:

- Removal and transportation of all Project components from the facility site
- Removal of the solar panels, solar panel racking, steel foundation posts and beams, inverters, transformers, overhead and underground cables and lines, equipment pads and foundations, equipment cabinets, and ancillary equipment
- Removal of civil facilities, access roads, security fence, and drainage structures and sedimentation basins

# 2 Setting

## 2.1 Environmental Setting

### 2.1.1 Local Climate and Meteorology

The Project site is located in the unincorporated area of western Fresno County near the community of Cantua Creek, which is part of the San Joaquin Valley Air Basin (SJVAB). The SJVAB encompasses the southern half of the California Central Valley and is comprised of eight counties: San Joaquin, Stanislaus, Fresno, Merced, Madera, Kings, Tulare, and western Kern County. The SJVAB is approximately 250 miles long and 35 miles in width (on average) and is bordered by the Sierra Nevada Mountains in the east (8,000 to 14,500 feet in elevation), the Coast Ranges in the west (averaging 3,000 feet in elevation), and the Tehachapi Mountains in the south (6,000 to 8,000 feet in elevation).

The overall climate in the SJVAB is warm and semi-arid. The San Joaquin Valley is in a Mediterranean climate zone. Mediterranean climate zones occur on the west coast of continents at 30 to 40 degrees latitude and are influenced by a subtropical high-pressure area most of the year. Mediterranean climates are characterized by sparse rainfall, which occurs mainly in the winter. There is only one wet season during the year and 90 percent of the precipitation falls during October through April. Snow in the San Joaquin Valley is infrequent and thunderstorms seldom occur. Summers are hot and dry. Summertime maximum temperatures often exceed 100 degrees Fahrenheit (°F) in the San Joaquin Valley. The SJVAB's topography has a dominating effect on wind patterns. Winds tend to blow somewhat parallel to the valley and mountain range orientation. In spring and early summer, thermal low-pressure systems develop over the interior basins east of the Sierra Nevada mountain range, and the Pacific High (a high-pressure system that develops over the central Pacific Ocean near the Hawaiian Islands) moves northward. These meteorological developments and the topography produce the high incidence of relatively strong northwesterly winds in the spring and early summer.

The subtropical high-pressure cell is strongest during spring, summer, and fall and produces subsiding air, which can result in temperature inversions in the San Joaquin Valley. A temperature inversion can act like a lid, inhibiting vertical mixing of the air mass at the surface. Any emissions of pollutants can be trapped below the inversion. Most of the surrounding mountains are above the normal height of summer inversions (1,500 to 3,000 feet). Winter-time high-pressure events can often last many weeks with surface temperatures lowering to 30°F. During these events, fog can be present, and inversions are extremely strong. These wintertime inversions can inhibit vertical mixing of pollutants to a few hundred feet (San Joaquin Valley Air Pollution Control District [SJVAPCD] 2015a).

### 2.1.2 Air Pollutants of Concern

#### Criteria Air Pollutants

The USEPA has identified criteria air pollutants that are a threat to public health and welfare. These pollutants are called "criteria" air pollutants because standards have been established for each of them to meet specific public health and welfare standards. Criteria pollutants that are a concern in the SJVAB are described below.

### *Ozone*

Ozone is a highly oxidative unstable gas produced by a photochemical reaction (triggered by sunlight) between nitrogen oxides ($NO_X$) and reactive organic gases (ROG)/volatile organic compounds (VOC).[1] ROG is composed of non-methane hydrocarbons (with specific exclusions), and $NO_X$ is composed of different chemical combinations of nitrogen and oxygen, mainly nitric oxide and nitrogen dioxide ($NO_2$). $NO_X$ is formed during the combustion of fuels, while ROG is formed during the combustion and evaporation of organic solvents. As a highly reactive molecule, ozone readily combines with many different atmosphere components. Consequently, high ozone levels tend to exist only while high ROG and $NO_X$ levels are present to sustain the ozone formation process. Once the precursors have been depleted, ozone levels rapidly decline. Because these reactions occur on a regional rather than local scale, ozone is considered a regional pollutant. In addition, because ozone requires sunlight to form, it mainly occurs in concentrations considered serious between April and October. Groups most sensitive to ozone include children, the elderly, people with respiratory disorders, and people who exercise strenuously outdoors (USEPA 2021a). Depending on the level of exposure, ozone can cause coughing and a sore or scratchy throat; make it more difficult to breathe deeply and vigorously and cause pain when taking a deep breath; inflame and damage the airways; make the lungs more susceptible to infection; and aggravate lung diseases such as asthma, emphysema, and chronic bronchitis.

### *Nitrogen Dioxide*

$NO_2$ is a by-product of fuel combustion. The primary sources are motor vehicles and industrial boilers, and furnaces. The principal form of $NO_X$ produced by combustion is nitric oxide (NO), but NO reacts rapidly to form $NO_2$, creating the mixture of NO and $NO_2$, commonly called $NO_x$. $NO_2$ is a reactive, oxidizing gas and an acute irritant capable of damaging cell linings in the respiratory tract. Breathing air with a high concentration of $NO_2$ can irritate airways in the human respiratory system. Such exposures over short periods can aggravate respiratory diseases leading to respiratory symptoms (such as coughing, wheezing, or difficulty breathing), hospital admissions, and visits to emergency rooms. Longer exposures to elevated concentrations of $NO_2$ may contribute to the development of asthma and potentially increase susceptibility to respiratory infections. People with asthma and children and the elderly are generally at greater risk for the health effects of $NO_2$ (USEPA 2021a). $NO_2$ absorbs blue light and causes a reddish-brown cast to the atmosphere and reduced visibility. It can also contribute to the formation of ozone/smog and acid rain.

### *Sulfur Dioxide*

Sulfur dioxide ($SO_2$) is included in a group of highly reactive gases known as "oxides of sulfur." The largest sources of $SO_2$ emissions are from fossil fuel combustion at power plants (73 percent) and other industrial facilities (20 percent). Smaller sources of $SO_2$ emissions include industrial processes such as extracting metal from ore and burning fuels with a high sulfur content by locomotives, large ships, and off-road equipment. Short-term exposures to $SO_2$ can harm the human respiratory system and make breathing difficult. People with asthma, particularly children, are sensitive to these effects of $SO_2$ (USEPA 2021a).

[1] The California Air Resources Board defines VOC and ROG similarly as, "any compound of carbon excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate," (40 Code of Federal Regulations 51.100) with the exception that VOC are compounds that participate in atmospheric photochemical reactions. For the purposes of this analysis, ROG and VOC are considered comparable in terms of mass emissions, and the term ROG is used in this document.

### *Carbon Monoxide*

Carbon monoxide (CO) is a localized pollutant found in high concentrations only near its source. The primary source of CO, a colorless, odorless, poisonous gas, is automobile traffic's incomplete combustion of petroleum fuels. Therefore, elevated concentrations are usually only found near areas of high traffic volumes. Other sources of CO include the incomplete combustion of petroleum fuels at power plants and fuel combustion from wood stoves and fireplaces during the winter. When CO levels are elevated outdoors, they can be of particular concern for people with some types of heart disease. These people already have a reduced ability to get oxygenated blood to their hearts in situations where they need more oxygen than usual. As a result, they are especially vulnerable to the effects of CO when exercising or under increased stress. In these situations, short-term exposure to elevated CO may result in reduced oxygen to the heart accompanied by chest pain, also known as angina (USEPA 2021a).

### *Particulate Matter*

Particulates less than 10 microns in diameter ($PM_{10}$) and less than 2.5 microns in diameter ($PM_{2.5}$) are comprised of finely divided solids and liquids such as dust, soot, aerosols, fumes, and mists. Both $PM_{10}$ and $PM_{2.5}$ are emitted into the atmosphere as by-products of fuel combustion and wind erosion of soil and unpaved roads. The atmosphere, through chemical reactions, can form particulate matter. The characteristics, sources, and potential health effects of $PM_{10}$ and $PM_{2.5}$ can be very different. $PM_{10}$ is generally associated with dust mobilized by wind and vehicles. In contrast, $PM_{2.5}$ is generally associated with combustion processes and formation in the atmosphere as a secondary pollutant through chemical reactions. $PM_{10}$ can cause increased respiratory disease, lung damage, cancer, premature death, reduced visibility, and surface soiling. For $PM_{2.5}$, short-term exposures (up to 24-hours duration) have been associated with premature mortality, increased hospital admissions for heart or lung causes, acute and chronic bronchitis, asthma attacks, emergency room visits, respiratory symptoms, and restricted activity days. These adverse health effects have been reported primarily in infants, children, and older adults with preexisting heart or lung diseases (California Air Resources Board [CARB] 2022a).

### *Lead*

Lead (Pb) is a metal found naturally in the environment, as well as in manufacturing products. The major sources of Pb emissions historically have been mobile and industrial. However, due to the USEPA's regulatory efforts to remove lead from gasoline, atmospheric Pb concentrations have declined substantially over the past several decades. The most dramatic reductions in Pb emissions occurred before 1990 due to the removal of Pb from gasoline sold for most highway vehicles. Pb emissions were further reduced substantially between 1990 and 2008, with reductions occurring in the metals industries at least partly due to national emissions standards for hazardous air pollutants (USEPA 2013). As a result of phasing out leaded gasoline, metal processing is currently the primary source of Pb emissions. The highest Pb level in the air is generally found near Pb smelters. Other stationary sources include waste incinerators, utilities, and Pb-acid battery manufacturers. Pb can adversely affect the nervous system, kidney function, immune system, reproductive and developmental systems, and cardiovascular system depending on exposure. Pb exposure also affects the oxygen-carrying capacity of the blood. The Pb effects most likely encountered in current populations are neurological in children. Infants and young children are susceptible to Pb exposures, contributing to behavioral problems, learning deficits, and lowered intelligence quotient (USEPA 2021a).

## Toxic Air Contaminants

In addition to the criteria pollutants discussed above, Toxic Air Contaminants (TAC) are a diverse group of airborne substances that may cause or contribute to an increase in deaths or serious illness, or that may pose a present or potential hazard to human health. TACs include both organic and inorganic chemical substances that may be emitted from a variety of common sources, including gasoline stations, motor vehicles, dry cleaners, industrial operations, painting operations, and research and teaching facilities. One of the main sources of TACs in California is diesel engine exhaust that contains solid material known as diesel particulate matter (DPM). More than 90 percent of DPM is less than one micron in diameter (about 1/70th the diameter of a human hair) and thus is a subset of $PM_{2.5}$. Because of their extremely small size, these particles can be inhaled and eventually trapped in the bronchial and alveolar regions of the lungs (CARB 2022b). TACs are different than criteria pollutants because ambient air quality standards have not been established for TACs. TACs occurring at extremely low levels may still cause health effects and it is typically difficult to identify levels of exposure that do not produce adverse health effects. TAC impacts are described by carcinogenic risk and by chronic (i.e., long duration) and acute (i.e., severe but of short duration) adverse effects on human health. People exposed to TACs at sufficient concentrations and durations may have an increased chance of getting cancer or experiencing other serious health effects. These health effects can include asthma, respiratory symptoms, and decreased lung function (CARB 2022b). The Fresno County Department of Public Health has not published health studies specific to potentially affected populations within six miles of the Project site related to the health effects of TACs or respiratory illnesses, cancers, or related diseases (County of Fresno 2023).

## Dust-related Concerns

### *Valley Fever*

Valley Fever or coccidioidomycosis is caused locally by the microscopic fungus *Coccidioides immitis (C. immitis)*. The *Coccidioides* fungus resides in the soil in the southwestern United States (U.S.), northern Mexico, and parts of Central and South America. During drought years, the number of organisms competing with *C. immitis* decreases, and *the C. immitis* remains alive but dormant. When rain finally occurs, the fungal spores germinate and multiply more than usual because of fewer other competing organisms. Later, the soil dries out in the summer and fall, and the fungi can become airborne and potentially infectious (Kirkland and Fierey 1996).

Infection occurs when the spores of the fungus become airborne and are inhaled. The fungal spores become airborne when contaminated soil is disturbed by human activities, such as construction and agricultural activities, and natural phenomena, such as windstorms, dust storms, and earthquakes. About 60 percent of infected persons have no symptoms. The remainder develop flu-like symptoms that can last for a month and tiredness that can sometimes last for longer than a few weeks. Common symptoms include fatigue, cough, chest pain, fever, rashes on upper body or legs, headaches, muscle aches, night sweats, and unexplained weight loss (California Department of Public Health 2021). Without proper treatment, Valley Fever can lead to severe pneumonia, meningitis, and even death. Both humans and animals can become infected with Valley Fever, but the infection is not contagious and cannot spread from one person or animal to another (California Department of Public Health 2021).

Diagnosis of Valley Fever is conducted through a sample of blood, other body fluid, or biopsy of affected tissue. Valley Fever is treatable with anti-fungal medicines. Once recovered from the disease, the individual is protected against further infection. Persons at highest risk from exposure are those with compromised immune systems, such as those with human immunodeficiency virus and those with chronic pulmonary disease. Farmers, construction workers, and others who engage in activities that disturb the soil are at highest risk for Valley Fever. Infants, pregnant women, diabetics, people of African, Asian, Latino, or Filipino descent, and the elderly may be at increased risk for disseminated disease. Historically, people at risk for infection are individuals not already immune to the disease and whose jobs involve extensive contact with soil dust, such as construction or agricultural workers and archeologists (Los Angeles County Health Department 2013). Most cases of Valley Fever (over 65 percent) are diagnosed in people living in the Central Valley and Central Coast regions (California Department of Public Health 2021).

There is no vaccine to prevent Valley Fever. However, the California Department of Public Health recommends the following practical tips to reduce exposure (2021):

- Stay inside and keep windows and doors closed when it is windy outside and the air is dusty, especially during dust storms.
- Consider avoiding outdoor activities that involve close contact to dirt or dust, including yard work, gardening, and digging, especially if you are in one of the groups at higher risk for severe or disseminated Valley fever.
- Cover open dirt areas around your home with grass, plants, or other ground cover to help reduce dusty, open areas.
- While driving in these areas, keep car windows closed and use recirculating air, if available.
- Try to avoid dusty areas, like construction or excavation sites.
- If you cannot avoid these areas, or if you must be outdoors in dusty air, consider wearing an N95 respirator (a type of face mask) to help protect against breathing in dust that can cause Valley fever.

However, if in situations where digging dirt or stirring up dust will happen, then the following tips are recommended:

- Stay upwind of the area where dirt is being disturbed.
- Wet down soil before digging or disturbing dirt to reduce dust.
- Consider wearing an N95 respirator (mask).
- After returning indoors, change out of clothes if covered with dirt.
    - Be careful not to shake out clothing and breathe in the dust before washing. If someone else is washing your clothes, warn the person before they handle the clothes.

In 2022, approximately 448 cases of Valley Fever were reported in Fresno County. This is an increase of 43 cases compared to 2021 (405 cases) (California Department of Public Health 2023).

### 2.1.3 Sensitive Receptors

Some receptors are considered more sensitive than others to air pollutants. The reasons for greater than average sensitivity include preexisting health problems, proximity to emissions sources, or duration of exposure to air pollutants. Title 20, CCR, Section 1704, Appendix B defines a sensitive receptor as infants and children, the elderly, and the chronically ill, and any other member of the general population who is more susceptible to the effects of the exposure than the population at large. Schools, hospitals, and convalescent homes are considered relatively sensitive to poor air quality because children, elderly people, and the infirmed are more susceptible to respiratory distress and other air quality-related health problems than the general public. Residential areas are considered sensitive to poor air quality because people usually stay home for extended periods, with greater associated exposure to ambient air quality. Recreational uses are also considered sensitive due to the greater exposure to ambient air quality conditions because vigorous exercise associated with recreation places a high demand on the human respiratory system. Ambient air quality standards were established to represent the levels of air quality considered sufficient, with a margin of safety, to protect public health and welfare. Standards are designed to protect that segment of the public most susceptible to respiratory distress, such as children under 14; the elderly over 65; persons engaged in strenuous work or exercise; and people with cardiovascular and chronic respiratory diseases.

Sensitive receptors are located immediately adjacent to the Project site. The sensitive receptors include single family residents along South Sonoma Avenue, West Cerini Avenue, and West Mount Whitney Avenue. Sensitive receptors identified in the analysis are included in Figure 3.

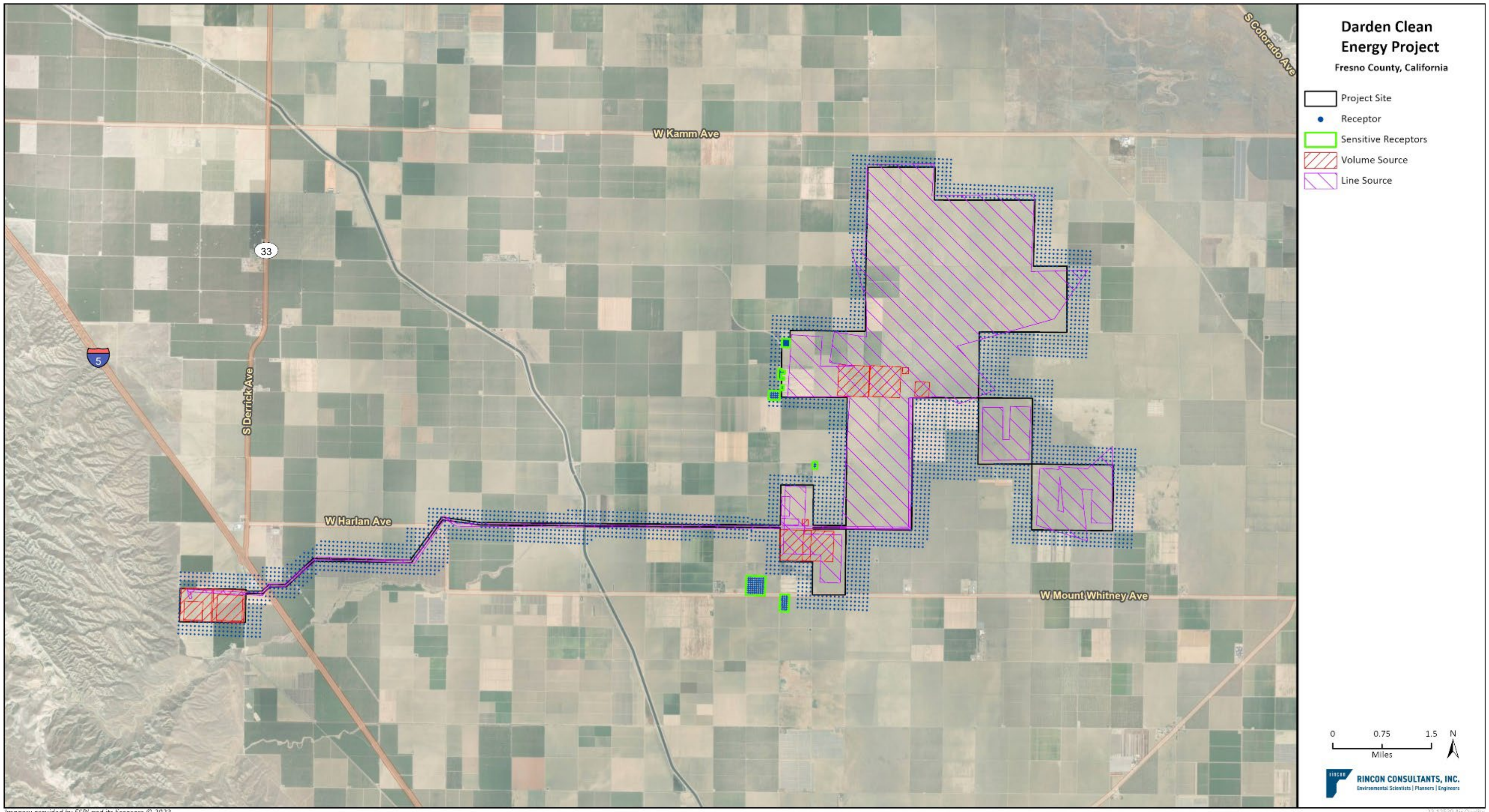
### 2.1.4 Greenhouse Gases

Gases that trap heat in the atmosphere are known as GHGs. GHGs allow sunlight to enter the atmosphere but trap a portion of the outward-bound infrared radiation that warms the air. The process is similar to the effect greenhouses have in raising the internal temperature of the structure. Both natural processes and human activities emit GHGs. The accumulation of GHGs in the atmosphere regulates the Earth's temperature, but emissions from human activities (such as fossil fuel-based electricity production and the use of motor vehicles) have elevated the concentration of GHGs in the atmosphere. Scientists agree that this accumulation of GHGs has contributed to an increase in the temperature of the Earth's atmosphere and to global climate change. Global climate change is a change in the average weather on Earth that can be measured by wind patterns, storms, precipitation, and temperature. Although there is disagreement as to the rate of global climate change and the extent of the impacts attributable to human activities, most scientists agree there is a direct link between increased emissions of GHGs and long-term global temperature increases.

The gases widely seen as the principal contributors to human-induced climate change include carbon dioxide ($CO_2$), methane ($CH_4$), nitrous oxides ($N_2O$), fluorinated gases such as hydrofluorocarbons (HFCs) and perfluorocarbons (PFC), and sulfur hexafluoride ($SF_6$). Water vapor is excluded from the list of GHGs because it is short-lived in the atmosphere, and natural processes, such as oceanic evaporation, largely determine its atmospheric concentrations.

GHGs are emitted by natural processes and human activities. Of these gases, $CO_2$ and $CH_4$ are emitted in the greatest quantities from human activities. Emissions of $CO_2$ are usually by-products of fossil fuel combustion, and $CH_4$ results from off-gassing associated with agricultural practices and landfills. Human-made GHGs, many of which have greater heat-absorption potential than $CO_2$, include fluorinated gases and $SF_6$.

## Figure 3 Sources and Sensitive Receptors

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22-12530 Air Quality
Fig 3 Sources and Receptors

Different types of GHGs have varying global warming potentials (GWP). The GWP of a GHG is the potential of a gas or aerosol to trap heat in the atmosphere over a specified timescale (generally 100 years) (USEPA 2021b). Because GHGs absorb different amounts of heat, a common reference gas ($CO_2$) is used to relate the amount of heat absorbed to the amount of the gas emitted, referred to as "carbon dioxide equivalent" ($CO_2e$), which is the amount of GHG emitted multiplied by its GWP. Carbon dioxide has a 100-year GWP of one. By contrast, methane has a GWP of 30, meaning its global warming effect is 30 times greater than $CO_2$ on a molecule per molecule basis (Intergovernmental Panel on Climate Change [IPCC] 2021a).[2]

The use of $SF_6$ in electric utility systems and switchgear, including circuit breakers, poses a concern because this pollutant has an extremely high GWP (one pound of $SF_6$ is the equivalent warming potential of approximately 24,600 pounds of $CO_2$) (IPCC 2021b).[3] $SF_6$ is inert and non-toxic, and is encapsulated in circuit breaker assemblies. $SF_6$ is a GHG with substantial global warming potential because of its chemical nature and long residency time within the atmosphere. However, under normal conditions, it would be completely contained in the equipment and $SF_6$ would only be released in the unlikely event of a failure, leak, or crack in the circuit breaker housing. New circuit breaker designs have been developed over the past several years to minimize the potential for leakage, compared to that of past designs.

## Potential Effects of Climate Change

Globally, climate change has the potential to affect numerous environmental resources though potential impacts related to future air temperatures and precipitation patterns. Scientific modeling predicts that continued GHG emissions at or above current rates would induce more extreme climate changes during the twenty-first century than were observed during the twentieth century. Each of the past three decades has been warmer than all the previous decades in the instrumental record, and the decade from 2000 through 2010 has been the warmest. The observed global mean surface temperature (GMST) from 2015 to 2017 was approximately 1° Celsius (C) higher than the average GMST over the period from 1880 to 1900 (National Oceanic and Atmospheric Administration 2020). Furthermore, several independently analyzed data records of global and regional Land-Surface Air Temperature (LSAT) obtained from station observations jointly indicate that LSAT and sea surface temperatures have increased. Due to past and current activities, anthropogenic GHG emissions have increased global mean surface temperature at a rate of approximately 0.1°C per decade since 1900. In addition to these findings, there are identifiable signs that global warming is currently taking place, including substantial ice loss in the Arctic over the past two decades (IPCC 2023).

According to *California's Fourth Climate Change Assessment*, statewide temperatures from 1986 to 2016 were approximately 0.6 to 1.1°C higher than those recorded from 1901 to 1960. Potential impacts of climate change in California may include reduced water supply from snowpack, sea level rise, more extreme heat days per year, more large forest fires, and more drought years (State of California 2018). In addition to statewide projections, *California's Fourth Climate Change Assessment* includes regional reports that summarize climate impacts and adaptation solutions for nine regions of the state and regionally-specific climate change case studies (State of California 2018). However, while there is growing scientific consensus about the possible effects of climate change at a global and statewide

[2] The IPCC's (2021) *Sixth Assessment Report* determined that methane has a GWP of 30. However, the 2022 Climate Change Scoping Plan published by the CARB uses a GWP of 25 for methane, consistent with the Intergovernmental Panel on Climate Change's (2007) *Fourth Assessment Report*. Therefore, this analysis utilizes the GWPs from the Fourth Assessment Report.

[3] A global warming potential of 23,900 was used to convert emissions to $CO_2e$. This value is based on the global warming potential in the USEPA Mandatory Reporting Program Regulations (40 Code of Federal Regulations Part 98, Subpart A), and deviates from the use of GWPs from the IPCC 6th Assessment Report which was used for the conversion of $CH_4$ and $N_2O$.

level, current scientific modeling tools are unable to predict what local impacts may occur with a similar degree of accuracy. A summary follows of some of the potential effects that could be experienced in California as a result of climate change.

### *Air Quality*

Scientists project that the annual average maximum daily temperatures in California could rise by 2.4 to 3.2°C in the next 50 years and by 3.1 to 4.9°C in the next century (State of California 2018). Higher temperatures are conducive to air pollution formation, and rising temperatures could therefore result in worsened air quality in California. As a result, climate change may increase the concentration of ground-level ozone, but the magnitude of the effect, and therefore its indirect effects, are uncertain. In addition, as temperatures have increased in recent years, the area burned by wildfires throughout the state has increased, and wildfires have occurred at higher elevations in the Sierra Nevada Mountains (State of California 2018). If higher temperatures continue to be accompanied by an increase in the incidence and extent of large wildfires, air quality could worsen. Severe heat accompanied by drier conditions and poor air quality could increase the number of heat-related deaths, illnesses, and asthma attacks throughout the state. However, if higher temperatures are accompanied by wetter, rather than drier conditions, the rains could tend to temporarily clear the air of particulate pollution, which would effectively reduce the number of large wildfires and thereby ameliorate the pollution associated with them (California Natural Resources Agency 2009).

### *Water Supply*

Analysis of paleoclimatic data (such as tree-ring reconstructions of stream flow and precipitation) indicates a history of naturally and widely varying hydrologic conditions in California and the west, including a pattern of recurring and extended droughts. Uncertainty remains with respect to the overall impact of climate change on future precipitation trends and water supplies in California. Year-to-year variability in statewide precipitation levels has increased since 1980, meaning that wet and dry precipitation extremes have become more common (California Department of Water Resources 2018). This uncertainty regarding future precipitation trends complicates the analysis of future water demand, especially where the relationship between climate change and its potential effect on water demand is not well understood. The average early spring snowpack in the western U.S., including the Sierra Nevada Mountains, decreased by about 10 percent during the last century. During the same period, sea level rose over 0.15 meter along the central and southern California coasts (State of California 2018). The Sierra snowpack provides the majority of California's water supply as snow that accumulates during wet winters is released slowly during the dry months of spring and summer. A warmer climate is predicted to reduce the fraction of precipitation that falls as snow and the amount of snowfall at lower elevations, thereby reducing the total snowpack (State of California 2018). Projections indicate that average spring snowpack in the Sierra Nevada and other mountain catchments in central and northern California will decline by approximately 66 percent from its historical average by 2050 (State of California 2018).

### *Hydrology and Sea Level Rise*

Climate change could affect the intensity and frequency of storms and flooding (State of California 2018). Furthermore, climate change could induce substantial sea level rise in the coming century. Rising sea level increases the likelihood of and risk from flooding. The rate of increase of global mean sea levels between 2006 and 2018 is approximately 3.7 millimeters per year, approximately two times the average rate of sea level rise in the twentieth century (IPCC 2023). Global mean sea levels increased by 0.20 meters between 1901 and 2018 (IPCC 2023). Sea levels are rising faster now than in the previous two millennia, and the rise will probably accelerate, even with robust GHG emission control measures. The most recent IPCC report predicts a mean sea level rise of 0.28 to 0.55 meter by 2100 (IPCC 2021a). Between the years of 1901 and 2018, the global mean sea level increased by 0.20 meters with human influence as the likely driver of said increase since at least 1971 (IPCC 2021a). A rise in sea levels could erode 31 to 67 percent of southern California beaches and cause flooding of approximately 370 miles of coastal highways during 100-year storm events. This would also jeopardize California's water supply due to saltwater intrusion and induce groundwater flooding and/or exposure of buried infrastructure (State of California 2018). Furthermore, increased storm intensity and frequency could affect the ability of flood-control facilities, including levees, to handle storm events.

### *Agriculture*

California has an over $50 billion annual agricultural industry that produces over a third of the country's vegetables and two-thirds of the country's fruits and nuts (California Department of Food and Agriculture 2020). Higher $CO_2$ levels can stimulate plant production and increase plant water-use efficiency. However, if temperatures rise and drier conditions prevail, certain regions of agricultural production could experience water shortages of up to 16 percent, which would increase water demand as hotter conditions lead to the loss of soil moisture. In addition, crop yield could be threatened by water-induced stress and extreme heat waves, and plants may be susceptible to new and changing pest and disease outbreaks (State of California 2018). Temperature increases could also change the time of year certain crops, such as wine grapes, bloom or ripen, and thereby affect their quality (California Climate Change Center 2006).

### *Ecosystems and Wildlife*

Climate change and the potential resultant changes in weather patterns could have ecological effects on the global and local scales. Soil moisture is likely to decline in many regions as a result of higher temperatures, and intense rainstorms are likely to become more frequent. Rising temperatures could have four major impacts on plants and animals: timing of ecological events; geographic distribution and range of species; species composition and the incidence of nonnative species within communities; and ecosystem processes, such as carbon cycling and storage (State of California 2018).

## Emissions Inventories

### *Global Emissions Inventory*

Worldwide anthropogenic GHG emissions totaled 47,000 million metric tons (MMT) of $CO_2e$ in 2015, which is a 43 percent increase from 1990 GHG levels (USEPA 2023a). Specifically, 34,522 MMT of $CO_2e$ of $CO_2$, 8,241 MMT of $CO_2e$ of $CH_4$, 2,997 MMT of $CO_2e$ of $N_2O$, and 1,001 MMT of $CO_2e$ of fluorinated gases were emitted in 2015. The largest source of GHG emissions were energy production and fuel use from vehicles and buildings, which accounted for 75 percent of the global GHG emissions. Agriculture uses and industrial processes contributed 12 percent and six percent, respectively. Waste sources contributed three percent and international transportation sources contributed two percent. These sources account for approximately 98 percent because there was a net sink of two percent from land use change (including afforestation/reforestation and emissions removals by other land use activities) (USEPA 2023a).

### United States Emissions Inventory

Total U.S. GHG emissions were 6,558 MMT of $CO_2e$ in 2019. Emissions decreased by 1.7 percent from 2018 to 2019. Since 1990, total U.S. emissions have increased by an average annual rate of 0.06 percent for a total increase of 1.8 percent between 1990 and 2019. The decrease from 2018 to 2019 reflects the combined influences of several long-term trends, including population changes, economic growth, energy market shifts, technological changes such as improvements in energy efficiency, and decrease carbon intensity of energy fuel choices. In 2019, the industrial and transportation end-use sectors accounted for 30 percent and 29 percent, respectively, of nationwide GHG emissions; while the commercial and residential end-use sectors accounted for 16 percent and 15 percent of nationwide GHG emissions, respectively, with electricity emissions distributed among the various sectors (USEPA 2023b).

### California Emissions Inventory

Based on the CARB California GHG Inventory for 2000-2019, California produced 418.2 MMT of $CO_2e$ in 2019, which is 7.2 MMT of $CO_2e$ lower than 2018 levels. The major source of GHG emissions in California is the transportation sector, which comprises 40 percent of the State's total GHG emissions. The industrial sector is the second largest source, comprising 21 percent of the State's GHG emissions, while electric power accounts for approximately 14 percent (CARB 2021). The magnitude of California's total GHG emissions is due in part to its large size and large population compared to other states. However, its relatively mild climate is a factor that reduces California's per capita fuel use and GHG emissions as compared to other states. In 2016, the State of California achieved its 2020 GHG emission reduction target of reducing emissions to 1990 levels, as emissions fell below 431 MMT of $CO_2e$ (CARB 2021).

### County of Fresno Municipal Emissions Inventory

In 2012, the County of Fresno County published an inventory of GHG emissions resulting from government operations during the 2010 calendar year. The GHG emissions are broken down by sector and source, which are unique to the operations of Fresno County. The inventory states that emissions for Fresno County government operations were approximately 117,977 metric tons (MT) $CO_2e$ in 2010. The inventory shows that the largest municipal source of GHG emissions is solid waste facilities (45 percent), followed by buildings (22 percent) and vehicles (18 percent). The inventory has not been updated since 2012 (Fresno County 2012).

# 2.2 Regulatory Setting

## 2.2.1 Air Quality

### Federal and State Criteria Air Pollutants

The federal Clean Air Act (CAA) and the California Clean Air Act (CCAA) establish ambient air quality standards and establish regulatory authorities designed to attain those standards. As required by the CAA, the USEPA has identified criteria pollutants and has established National Ambient Air Quality Standards (NAAQS) to protect public health and welfare. NAAQS have been established for ozone, CO, $NO_2$, $SO_2$, $PM_{10}$, $PM_{2.5}$, and Pb.

Under the CCAA, California has adopted the California Ambient Air Quality Standards (CAAQS), which are more stringent than the NAAQS for certain pollutants and averaging periods. Table 2 presents the current federal and state standards for regulated pollutants and the SJVAB's attainment status for each standard. California has also established CAAQS for sulfates, hydrogen sulfide, and vinyl chloride.

As required by the federal CAA and the CCAA, air basins or portions thereof have been classified as either "attainment" or "nonattainment" for each criteria air pollutant, based on whether the standards have been achieved. In some cases, an area's status is unable to be determined, in which case the area is designated "unclassified" (USEPA 2022). The air quality in an attainment area meets or is better than the NAAQS or CAAQS. A non-attainment area has air quality that is worse than the NAAQS or CAAQS. States are required to adopt enforceable plans, known as a State Implementation Plan (SIP), to achieve and maintain air quality meeting the NAAQS.

As shown in Table 2, the SJVAB currently is classified as nonattainment for the one-hour state ozone standard as well as for the federal and state eight-hour ozone standards. The SJVAB is also designated as nonattainment for the federal and state annual arithmetic mean and federal 24-hour $PM_{2.5}$ standards. Additionally, the SJVAB is classified as nonattainment for the state 24-hour and annual arithmetic mean $PM_{10}$ standards. The SJVAB is unclassified or classified as attainment for all other pollutant standards (SJVAPCD 2022a).

### Table 2 Federal and State Ambient Air Quality Standards

| | | State Standard | | National Standard | |
|---|---|---|---|---|---|
| Pollutant | Averaging Time | Concentration | SJVAB Attainment Status | Concentration | SJVAB Attainment Status |
| Ozone | 8-Hour<br>1-Hour | 0.070 ppm<br>0.090 ppm | Nonattainment/ Severe Nonattainment | 0.070 ppm<br>- | Nonattainment/ Extreme[1] |
| Carbon Monoxide (CO) | 1-Hour<br>8-Hour | 9.0 ppm<br>20 ppm | Attainment/ Unclassified | 9.0 ppm<br>35 ppm | Attainment/ Unclassified |
| Nitrogen Dioxide ($NO_2$) | 1-Hour<br>Annual | 0.180 ppm<br>0.030 ppm | Attainment | 0.100 ppm<br>0.053 ppm | Attainment/ Unclassified |
| Sulfur Dioxide ($SO_2$) | 1-Hour<br>3-Hour<br>24-Hour<br>Annual | 0.25 ppm<br>-<br>0.04 ppm<br>- | Attainment | 0.075 ppm<br>0.5 ppm*<br>0.14 ppm<br>0.03 ppm | Attainment/ Unclassified |
| Respirable Particulate Matter ($PM_{10}$) | 24-Hour<br>Annual | 50 $\mu g/m^3$<br>20 $\mu g/m^3$ | Nonattainment | 150 $\mu g/m^3$<br>- | Attainment |
| Fine Particulate Matter ($PM_{2.5}$) | 24-Hour<br>Annual | -<br>12 $\mu g/m^3$ | Nonattainment | 35 $\mu g/m^3$<br>12 $\mu g/m^3$ | Nonattainment |
| Lead (Pb) | 30-Day<br>Quarterly | 1.5 $\mu g/m^3$<br>- | Attainment | -<br>1.5 $\mu g/m^3$ | No Designation/ Classification |

ppm = parts per million; ppb = parts per billion; $\mu g/m^3$ = micrograms per cubic meter

[1] Though the San Joaquin Valley was initially classified as serious nonattainment for the 1997 8-hour ozone standard, EPA approved Valley reclassification to extreme nonattainment in the Federal Register on May 5, 2010 (effective June 4, 2010).

Source: San Joaquin Valley Air Pollution Control District 2022a

## Regional

### *San Joaquin Valley Air Pollution Control District*

The Project site is located within the jurisdiction of the SJVAPCD, which regulates air pollutant emissions throughout the SJVAB. The SJVAPCD enforces regulations and administers permits governing stationary sources. Pursuant to Assembly Bill 205 subsection 25545.1(b)(1), the CEC retains exclusive authority over permitting and supersedes any applicable statute, ordinance, or regulation of a local air quality management district. In the absence of CEC jurisdiction, the following regional rules and regulations are related to the Project:

- **Regulation VIII (Fugitive $PM_{10}$ Prohibitions)** contains rules developed pursuant to USEPA guidance for "serious" $PM_{10}$ nonattainment areas. Rules included under this regulation limit fugitive $PM_{10}$ emissions from the following sources: construction, demolition, excavation, extraction, and other earth moving activities, bulk materials handling, carryout and track-out, open areas, paved and unpaved roads, unpaved vehicle/equipment traffic areas, and agricultural sources. Table 3 contains control measures that the Applicants would implement during Project construction activities pursuant to *Rule 8021, Construction, Demolition, Excavation, Extraction, and Other Earthmoving Activities*.
- **Rule 2201 (New and Modified Stationary Source Review Rule)** applies to all new stationary sources or modified existing stationary sources that are subject to the SJVAPCD permit requirements. The rule requires review of the new or modified stationary source to ensure that the source does not interfere with the attainment or maintenance of ambient air quality standards.
- **Rule 4101 (Visibility)** limits the visible plume from any source to 20 percent opacity.
- **Rule 4102 (Nuisance)** prohibits the discharge of air contaminants or other materials in quantities that may cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public or which endanger the comfort, repose, health, or safety of any such person or the public.
- **Rule 4601 (Architectural Coatings)** limits volatile organic compound (VOC) emissions from architectural coatings. This rule specifies architectural coatings storage, cleanup, and labeling requirements.
- **Rule 4641 (Cutback, Slow Cure, and Emulsified Asphalt, Paving, and Maintenance Operations)** limits VOC emissions by restricting the application and manufacturing of certain types of asphalt for paving and maintenance operations and applies to the manufacture and use of cutback asphalt, slow cure asphalt and emulsified asphalt for paving and maintenance operations.
- **Rule 9510 (Indirect Source Review)** requires certain development projects to mitigate exhaust emissions from construction equipment greater than 50 horsepower to 20 percent below statewide average $NO_X$ emissions and 45 percent below statewide average $PM_{10}$ exhaust emissions. This rule also requires applicants to reduce baseline emissions of $NO_X$ and $PM_{10}$ emissions associated with operations by 33.3 percent and 50 percent respectively over a period of 10 years (SJVAPCD 2017).

In addition to reducing a portion of the development project's impact on air quality through compliance with District Rule 9510, a developer can further reduce a project's impact on air quality by entering a "Voluntary Emission Reduction Agreement" (VERA) with the SJVAPCD to further mitigate project impacts under CEQA. Under a VERA, the developer may fully mitigate project emission impacts by providing funds to the SJVAPCD, which then are used by the SJVAPCD to administer emission reduction projects (SJVAPCD 2015b).

### Table 3 SJVAPCD Rule 8021 Measures Applicable to the Project

| No. | Measure |
|---|---|
| A.1 | Pre-water site sufficient to limit visible dust emissions (VDE) to 20 percent opacity. |
| A.2 | Phase work to reduce the amount of disturbed surface area at any one time. |
| B.1 | Apply water or chemical/organic stabilizers/suppressants sufficient to limit VDE to 20 percent opacity; or |
| B.2 | Construct and maintain wind barriers sufficient to limit VDE to 20 percent opacity. If using wind barriers, control measure B1 above shall also be implemented. |
| B.3 | Apply water or chemical/organic stabilizers/suppressants to unpaved haul/access roads and unpaved vehicle/equipment traffic areas sufficient to limit VDE to 20 percent opacity and meet the conditions of a stabilized unpaved road surface. |
| C.1 | Restrict vehicular access to the area. |
| C.2 | Apply water or chemical/organic stabilizers/suppressants, sufficient to comply with the conditions of a stabilized surface. If an area having 0.5 acre or more of disturbed surface area remains unused for seven or more days, the area must comply with the conditions for a stabilized surface area as defined in section 3.58 of Rule 8011. |
| 5.3.1 | An owner/operator shall limit the speed of vehicles traveling on uncontrolled unpaved access/haul roads within construction sites to a maximum of 15 miles per hour. |
| 5.3.2 | An owner/operator shall post speed limit signs that meet state and federal Department of Transportation standards at each construction site’s uncontrolled unpaved access/haul road entrance. At a minimum, speed limit signs shall also be posted at least every 500 feet and shall be readable in both directions of travel along uncontrolled unpaved access/haul roads. |
| 5.4.1 | Cease outdoor construction, excavation, extraction, and other earthmoving activities that disturb the soil whenever VDE exceeds 20 percent opacity. Indoor activities such as electrical, plumbing, dry wall installation, painting, and any other activity that does not cause any disturbances to the soil are not subject to this requirement. |
| 5.4.2 | Continue operation of water trucks/devices when outdoor construction excavation, extraction, and other earthmoving activities cease, unless unsafe to do so. |
| 6.3.1 | An owner/operator shall submit a Dust Control Plan to the Air Pollution Control Officer (APCO) prior to the start of any construction activity on any site that will include ten acres or more of disturbed surface area for residential developments, or five acres or more of disturbed surface area for non-residential development, or will include moving, depositing, or relocating more than 2,500 cubic yards per day of bulk materials on at least three days. Construction activities shall not commence until the APCO has approved or conditionally approved the Dust Control Plan. An owner/operator shall provide written notification to the APCO within 10 days prior to the commencement of earthmoving activities via fax or mail. The requirement to submit a dust control plan shall apply to all such activities conducted for residential and non-residential (e.g., commercial, industrial, or institutional) purposes or conducted by any governmental entity. |
| 6.3.3 | The Dust Control Plan shall describe all fugitive dust control measures to be implemented before, during, and after any dust generating activity. |
| 6.3.4 | A Dust Control Plan shall contain all the [administrative] information described in Section 6.3.6 of this rule. The APCO shall approve, disapprove, or conditionally approve the Dust Control Plan within 30 days of plan submittal. A Dust Control Plan is deemed automatically approved if, after 30 days following receipt by the District, the District does not provide any comments to the owner/operator regarding the Dust Control Plan. |

Source: San Joaquin Valley Air Pollution Control District 2004

### *Air Quality Management Plan*

As required by the federal CAA and the CCAA, air basins or portions thereof have been classified as either "attainment" or "nonattainment" for each criteria air pollutant, based on if the standards have been achieved. Jurisdictions of nonattainment areas also are required to prepare an air quality management plan that includes strategies for achieving attainment. The SJVAPCD has approved management plans demonstrating how the SJVAB will reach attainment with the federal one-hour and eight-hour ozone and $PM_{2.5}$ standards.

#### OZONE ATTAINMENT PLANS

The *Extreme Ozone Attainment Demonstration Plan*, adopted by the SJVAPCD Governing Board October 8, 2004, sets forth measures and emission-reduction strategies designed to attain the federal one-hour ozone standard by November 15, 2010, as well as an emissions inventory, outreach, and rate of progress demonstration. This plan was approved by the USEPA on March 8, 2010; however, the USEPA's approval was subsequently withdrawn effective November 26, 2012, in response to a decision issued by the U.S. Court of Appeals for the Ninth Circuit (*Sierra Club v. EPA*, 671 F.3d 955) remanding USEPA's approval of these SIP revisions. Concurrent with the USEPA's final rule, CARB withdrew the 2004 Plan. The SJVAPCD developed a new plan for the one-hour ozone standard, the *2013 Plan for the Revoked 1-Hour Ozone Standard*, which it adopted in September 2013.

The *2007 Ozone Plan*, approved by CARB on June 14, 2007, demonstrates how the SJVAB would meet the federal eight-hour ozone standard. The *2007 Ozone Plan* includes a comprehensive list of regulatory and incentive-based measures to reduce emissions of ozone and particulate matter precursors throughout the SJVAB. Additionally, this plan calls for major advancements in pollution control technologies for mobile and stationary sources of air pollution, and an increase in state and federal funding for incentive-based measures to create adequate reductions in emissions to bring the entire SJVAB into attainment with the federal eight-hour ozone standard (SJVAPCD 2007a).

On April 16, 2009, the SJVAPCD Governing Board adopted the *Reasonably Available Control Technology Demonstration for Ozone State Implementation Plans (2009 RACT SIP)* (SJVAPCD 2009a). In part, the *2009 RACT SIP* satisfied the commitment by the SJVAPCD for a new reasonably available control technology analysis for the one-hour ozone plan (see discussion of the USEPA withdrawal of approval in the *Extreme 1-Hour Ozone Attainment Demonstration Plan* summary above) and was intended to prevent all sanctions that could be imposed by USEPA for failure to submit a required SIP revision for the one-hour ozone standard. With respect to the 8-hour standard, the plan also assesses the SJVAPCD's rules based on the adjusted major source definition of 10 tons per year (due to the SJVAB's designation as an extreme subsequently nonattainment area), evaluates SJVAPCD rules against new *Control Techniques Guidelines* promulgated since August 2006, and reviews additional rules and amendments that had been adopted by the Governing Board since August 17, 2006, for reasonably available control technology consistency.

The *2013 Plan for the Revoked 1-Hour Ozone Standard* was approved by the Governing Board on September 19, 2013 (SJVAPCD 2013a). Based on implementation of the ongoing control measures, preliminary modeling indicates that the SJVAB will attain the 1-hour standard before the final attainment year of 2022 and without relying on long-term measures under the federal CAA Section 182(e)(5) (SJVAPCD 2013a).

On June 19, 2014, the Governing Board adopted the *2014 Reasonably Available Control Technology Demonstration for the 8-Hour Ozone State Implementation Plan* (SJVAPCD 2014) that includes a demonstration that the SJVAPCD rules implement RACT. The plan reviews each of the $NO_x$ reduction rules and concludes that they satisfy requirements for stringency, applicability, and enforceability, and meet or exceed RACT. The plan's analysis of further ROG reductions through modeling and technical analyses demonstrates that added ROG reductions will not advance the SJVAB's ozone attainment. Each ROG rule evaluated in the 2009 RACT SIP has been subsequently approved by the USEPA as meeting RACT within the last two years. The subsequent attainment strategy, therefore, focuses on further $NO_X$ reductions.

SJVAPCD adopted the *2020 Reasonably Available Control Technology (RACT) Demonstration for the 2015 8-Hour Ozone Standard* in June 2020. This plan satisfies CAA requirements and ensures expeditious attainment of the 70 parts per billion eight-hour standard (SJVAPCD 2020).

SJVAPCD adopted the *2022 Plan for the 2015 8-Hour Ozone Standard* on December 15, 2022. This plan uses extensive science and research, state of the art air quality modeling, and the best available information in developing a strategy to attain the federal 2015 national ambient air quality standard (NAAQS) for ozone of 70 ppb as expeditiously as practicable. Building on decades of developing and implementing effective air pollution control strategies, this plan demonstrates that the reductions being achieved by the SJVAPCD and CARB strategy (72 percent reduction in $NO_X$ emissions by 2037) ensures expeditious attainment of the 2015 8-hour ozone standard by the 2037 attainment deadline.

SJVAPCD adopted the *2023 Maintenance Plan and Redesignation Request for the Revoked 1-Hour Ozone Standard* on June 15, 2023. This maintenance plan demonstrates SJVAPCD's consistency with all five criteria of Section 107(d)(3)(E) of the CAA to terminate all anti-backsliding provisions for the revoked 1-hour ozone standard, including Section 185 nonattainment fees. This Maintenance Plan also includes a demonstration that would ensure the area remains in attainment of the 1-hour ozone NAAQS through 2036. Therefore, SJVAPCD is requesting to be redesignated to attainment for the 1-hour ozone NAAQS and requesting termination of all anti-backsliding obligations.

#### PARTICULATE MATTER ATTAINMENT PLANS

In June 2007, the SJVAPCD Board adopted the *2007 $PM_{10}$ Maintenance Plan and Request for Redesignation* (SJVAPCD 2007b). This plan demonstrates how $PM_{10}$ attainment in the SJVAB will be maintained in the future. Effective November 12, 2008, USEPA redesignated the SJVAB to attainment for the $PM_{10}$ NAAQS and approved the 2007 $PM_{10}$ Maintenance Plan (USEPA 2008).

In April 2008, the SJVAB Board adopted the *2008 $PM_{2.5}$ Plan* and approved amendments to Chapter 6 of the *2008 $PM_{2.5}$ Plan* on June 17, 2010 (SJVAPCD 2008a). This plan was designed to addresses USEPA's annual $PM_{2.5}$ standard of 15 micrograms per cubic meter (µg/m³), which was established by USEPA in 1997. In December of 2012, the SJVAPCD adopted the *2012 $PM_{2.5}$ Attainment Plan*, which addresses USEPA's 24-hour $PM_{2.5}$ standard of 35 µg/m³, which was established by USEPA in 2006 (SJVAPCD 2012). In April 2015, the SJVAPCD Board adopted the *2015 Plan for the 1997 $PM_{2.5}$ Standard* that addresses the USEPA's annual and 24-hour $PM_{2.5}$ standards established in 1997 after the SJVAB experienced higher $PM_{2.5}$ levels in winter 2013–2014 due to the extreme drought, stagnation, strong inversions, and historically dry conditions, and the SJVAPCD was unable to meet the initial attainment date of December 31, 2015 (SJVAPCD 2015c).

SJVAPCD adopted the *2016 Moderate Area Plan for the 2012 $PM_{2.5}$ Standard* on September 15, 2016. This plan addresses the USEPA federal annual $PM_{2.5}$ standard of 12 µg/m³, established in 2012. This plan includes an attainment impracticability demonstration and request for reclassification of the Valley from Moderate nonattainment to Serious nonattainment (SJVAPCD 2016).

SJVAPCD adopted the *2018 Plan for the 1997, 2006, and 2012 $PM_{2.5}$ Standards* in November 2018. This plan addresses the USEPA federal 1997 annual $PM_{2.5}$ standard of 15 µg/m³ and the 24-hour $PM_{2.5}$

standard of 65 µg/m$^3$; the 2006 24-hour $PM_{2.5}$ standard of 35 µg/m$^3$; and the 2012 annual $PM_{2.5}$ standard of 12 µg/m$^3$. The plan demonstrates attainment of the federal $PM_{2.5}$ standards as expeditiously as practicable as required under the federal CAA (SJVAPCD 2018). The district is currently developing the 2023 Plan for the 2012 Annual $PM_{2.5}$ Standard.

## Local

### *Fresno County*

The Fresno County General Plan was adopted in October 2000. The Open Space Element contains air quality policies to reduce emissions from new developments (County of Fresno 2000). The following policies are applicable to the Project:

- **Policy OS-G.13:** The County shall include fugitive dust control measures as a requirement for subdivision maps, site plans, and grading permits. This will assist in implementing the SJVAPCD's $PM_{10}$ regulation (Regulation VIII). Enforcement actions can be coordinated with the Air District's Compliance Division.
- **Policy OS-G.14.** The County shall require all access roads, driveways, and parking areas serving new commercial and industrial development to be constructed with materials that minimize particulate emissions and are appropriate to the scale and intensity of use.

## Existing Ambient Air Quality

The SJVAPCD operates 10 air quality monitoring station in the SJVAB within Fresno County. The purpose of the monitoring stations is to measure ambient concentrations of pollutants and determine whether ambient air quality meets the California and federal standards. The nearest monitoring station is the Tranquility-32650 West Adams Avenue monitoring station, located at 32650 West Adams Avenue in Fresno, approximately 13 miles north of the Project site. This monitoring station measures only ozone and $PM_{2.5}$. For $PM_{10}$ and $NO_2$; therefore, additional data from the Fresno-Drummond Street monitoring station was used, which is located at 4706 East Drummond Street in Fresno, approximately 38 miles northeast of the Project site. In addition, data from the Fresno-Garland monitoring station, approximately 30-miles northeast of the Project site, is provided. Because monitoring is not generally conducted for pollutants for which the SJVAB is in attainment, there is no recent monitoring data available for CO or $SO_2$.

Table 4 indicates the number of days that each of the federal and state standards has been exceeded at monitoring stations near the Project site in each of the last three years for which data is available. The federal and State 8-hour ozone standards were exceeded in 2020 and 2021 at the Tranquility monitoring station. The federal and State 8-hour ozone standards were exceeded at the Fresno-Drummond and Fresno-Garland monitoring stations. Additionally, the $PM_{10}$ state standards were exceeded all 3 years at all three monitoring stations. The federal $PM_{10}$ standards were exceeded in 2020 at all three monitoring stations, and 2021 at the Fresno-Garland monitoring stations. The $PM_{2.5}$ federal standards were exceeded in 2020 and 2021 at the Tranquility monitoring station at in 2020, 2021, and 2022 at the Fresno-Garland monitoring station. No other federal or state standards were exceeded at this monitoring station.

**Table 4 Ambient Air Quality at the Monitoring Station**

| Pollutant | 2020 | 2021 | 2022 |
|---|---|---|---|
| **Tranquility 32650 West Adams Avenue Monitoring Station** | | | |
| **Ozone** | | | |
| 8 Hour Ozone (ppm), 8-Hr Maximum | 0.079 | 0.080 | 0.066 |
| Number of Days of State exceedances (>0.070) | 3 | 6 | 0 |
| Number of days of Federal exceedances (>0.070) | 3 | 5 | 0 |
| Ozone (ppm), Worst Hour | 0.087 | 0.088 | 0.074 |
| Number of days above State standard (>0.09 ppm) | 0 | 0 | 0 |
| **Respirable Particulate Matter, $PM_{10}$** | | | |
| Particulate Matter 10 microns, $\mu g/m^3$, Worst 24 Hours | -- | -- | -- |
| Number of days above State standard (>50 $\mu g/m^3$) | -- | -- | -- |
| Number of days above Federal standard (>150 $\mu g/m^3$) | -- | -- | -- |
| **Fine Particulate Matter, $PM_{2.5}$** | | | |
| Particulate Matter <2.5 microns, $\mu g/m^3$, Worst 24 Hours | 146.2 | 65.3 | 33.1 |
| Number of days above Federal standard (>35 $\mu g/m^3$) | 21 | 7 | 0 |
| **Nitrogen Dioxide, $NO_2$** | | | |
| Nitrogen Dioxide (ppb), Worst Hour | 66.8 | 64.5 | 58.3 |
| Number of days above State standard (>180 ppb) | 0 | 0 | 0 |
| Number of days above Federal standard (>100 ppb) | 0 | 0 | 0 |
| **Fresno-Drummond Street Monitoring Station** | | | |
| **Ozone** | | | |
| 8 Hour Ozone (ppm), 8-Hr Maximum | 0.091 | 0.099 | 0.089 |
| Number of Days of State exceedances (>0.070) | 27 | 41 | 8 |
| Number of days of Federal exceedances (>0.070) | 27 | 39 | 8 |
| Ozone (ppm), Worst Hour | 0.123 | 0.125 | 0.111 |
| Number of days above State standard (>0.09 ppm) | 11 | 9 | 3 |
| **Respirable Particulate Matter, $PM_{10}$** | | | |
| Particulate Matter 10 microns, $\mu g/m^3$, Worst 24 Hours | 350.4 | 151.8 | 73.4 |
| Number of days above State standard (>50 $\mu g/m^3$) | 25 | 20 | 133 |
| Number of days above Federal standard (>150 $\mu g/m^3$) | 1 | 0 | 0 |
| **Fine Particulate Matter, $PM_{2.5}$[1]** | | | |
| Particulate Matter <2.5 microns, $\mu g/m^3$, Worst 24 Hours | -- | -- | -- |
| Number of days above Federal standard (>35 $\mu g/m^3$) | -- | -- | -- |
| **Nitrogen Dioxide, $NO_2$** | | | |
| Nitrogen Dioxide (ppb), Worst Hour | 66.8 | 64.5 | 58.3 |
| Number of days above State standard (>180 ppb) | 0 | 0 | 0 |

| Pollutant | 2020 | 2021 | 2022 |
|---|---|---|---|
| Number of days above Federal standard (>100 ppb) | 0 | 0 | 0 |
| **Fresno-Garland Monitoring Station** | | | |
| **Ozone** | | | |
| 8 Hour Ozone (ppm), 8-Hr Maximum | 0.099 | 0.093 | 0.083 |
| Number of Days of State exceedances (>0.070) | 24 | 22 | 10 |
| Number of days of Federal exceedances (>0.070) | 24 | 18 | 10 |
| Ozone (ppm), Worst Hour | 0.119 | 0.112 | 0.096 |
| Number of days above State standard (>0.09 ppm) | 10 | 6 | 2 |
| **Respirable Particulate Matter, $PM_{10}$** | | | |
| Particulate Matter 10 microns, $\mu g/m^3$, Worst 24 Hours | 296.4 | 281.0 | 116.1 |
| Number of days above State standard (>50 $\mu g/m^3$) | 99 | 91 | 73 |
| Number of days above Federal standard (>150 $\mu g/m^3$) | 14 | 1 | 0 |
| **Fine Particulate Matter, $PM_{2.5}$** | | | |
| Particulate Matter <2.5 microns, $\mu g/m^3$, Worst 24 Hours | 163.2 | 99.9 | 53.3 |
| Number of days above Federal standard (>35 $\mu g/m^3$) | 62 | 58 | 61 |
| **Nitrogen Dioxide, $NO_2$** | | | |
| Nitrogen Dioxide (ppb), Worst Hour | 47.5 | 56.3 | 54.7 |
| Number of days above State standard (>180 ppb) | 0 | 0 | 0 |
| Number of days above Federal standard (>100 ppb) | 0 | 0 | 0 |

$\mu g/m^3$ = micrograms per cubic meter; ppb = parts per billion

[1] Air quality data for $PM_{2.5}$ is unavailable from the Fresno-Drummond Monitoring Station.

Source: California Air Resources Board 2023

## 2.2.2 Greenhouse Gases

### Federal Regulations

#### *Federal Clean Air Act*

The U.S. Supreme Court determined in *Massachusetts et al. v. Environmental Protection Agency et al.* ([2007] 549 U.S. 05-1120) that the USEPA has the authority to regulate motor vehicle GHG emissions under the federal CAA. The USEPA issued a Final Rule for mandatory reporting of GHG emissions in October 2009. This Final Rule applies to fossil fuel suppliers, industrial gas suppliers, direct GHG emitters, and manufacturers of heavy-duty and off-road vehicles and vehicle engines and requires annual reporting of emissions. In 2012, the USEPA issued a Final Rule that established the GHG permitting thresholds that determine when CAA permits under the New Source Review Prevention of Significant Deterioration and Title V Operating Permit programs are required for new and existing industrial facilities.

In *Utility Air Regulatory Group v. Environmental Protection Agency* (134 Supreme Court 2427 [2014]), the U.S. Supreme Court held the USEPA may not treat GHGs as an air pollutant for purposes of determining whether a source can be considered a major source required to obtain a Prevention of

Significant Deterioration or Title V permit. The Court also held that Prevention of Significant Deterioration permits otherwise required based on emissions of other pollutants may continue to require limitations on GHG emissions based on the application of Best Available Control Technology.

### *Final Rule to Revise Existing National GHG Emissions Standards for Passenger Cars and Light Trucks Through Model Year 2026.*

The USEPA finalized the federal GHG emissions standards for passenger cars and light trucks for model years 2023 through 2026 in February 2022. These standards will leverage current and future technologies to result in the avoidance of more than 3 billion tons of GHGs through 2050.

## State Regulations

CARB is responsible for the coordination and oversight of state and local air pollution control programs in California. There are numerous regulations aimed at reducing the state's GHG emissions. These initiatives are summarized below.

### *California Advanced Clean Cars Program*

Assembly Bill (AB) 1493 (2002), California's Advanced Clean Cars program (referred to as "Pavley"), requires CARB to develop and adopt regulations to achieve "the maximum feasible and cost-effective reduction of GHG emissions from motor vehicles." On June 30, 2009, the USEPA granted the waiver of CAA preemption to California for its GHG emission standards for motor vehicles, beginning with the 2009 model year, which allows California to implement more stringent vehicle emission standards than those promulgated by the USEPA. Pavley I regulates model years from 2009 to 2016 and Pavley II, now referred to as "LEV (Low Emission Vehicle) III GHG," regulates model years from 2017 to 2025. The Advanced Clean Cars program coordinates the goals of the LEV, Zero Emissions Vehicles (ZEV), and Clean Fuels Outlet programs and would provide major reductions in GHG emissions. By 2025, the rules will be fully implemented, and new automobiles will emit 34 percent fewer GHGs and 75 percent fewer smog-forming emissions from their model year 2016 levels (CARB 2011).

### *Assembly Bill 1007 (State Alternative Fuels Plan)*

AB 1007 (Chapter 371, Statutes of 2005) required the CEC to prepare a state plan to increase the use of alternative fuels in California. The CEC prepared the State Alternative Fuels Plan (SAF Plan) in partnership with CARB and in consultation with other federal, State, and local agencies. The SAF Plan presents strategies and actions California must take to increase the use of alternative non-petroleum fuels in a manner that minimizes costs to California and maximizes the economic benefits of in-state production. The SAF Plan assessed various alternative fuels and developed fuel portfolios to meet California's goals to reduce petroleum consumption, increase alternative fuels use, reduce GHG emissions, and increase in-State production of biofuels without causing a significant degradation of public health and environmental quality. The SAF Plan provided a framework for subsequent legislation, including AB 118 (Chapter 750, Statutes of 2007), to be passed, which currently provides 690 million dollars in funding for medium- and heavy-duty battery-electric and hydrogen infrastructure, and 77 million dollars for hydrogen refueling infrastructure (CARB 2007, CEC 2021b).

### *California Global Warming Solutions Act of 2006 (Assembly Bill 32 and Senate Bill 32)*

The "California Global Warming Solutions Act of 2006," (AB 32), outlines California's major legislative initiative for reducing GHG emissions. AB 32 codifies the statewide goal of reducing GHG emissions to 1990 levels by 2020 and requires CARB to prepare a Scoping Plan that outlines the main state strategies for reducing GHG emissions to meet the 2020 deadline. In addition, AB 32 requires CARB to adopt regulations to require reporting and verification of statewide GHG emissions. Based on this guidance, CARB approved a 1990 statewide GHG level and 2020 target of 431 MMT of $CO_2e$, which was achieved in 2016. CARB approved the Scoping Plan on December 11, 2008, which included GHG emission reduction strategies related to energy efficiency, water use, and recycling and solid waste, among others (CARB 2008). Many of the GHG reduction measures included in the Scoping Plan (e.g., Low Carbon Fuel Standard, Advanced Clean Car standards, and Cap-and-Trade) have been adopted since the Scoping Plan's approval.

The CARB approved the 2013 Scoping Plan update in May 2014. The update defined the CARB's climate change priorities for the next five years, set the groundwork to reach post-2020 statewide goals, and highlighted California's progress toward meeting the "near-term" 2020 GHG emission reduction goals defined in the original Scoping Plan. It also evaluated how to align the state's longer term GHG reduction strategies with other state policy priorities, including those for water, waste, natural resources, clean energy, transportation, and land use (CARB 2014).

On September 8, 2016, the governor signed Senate Bill (SB) 32 into law, extending the California Global Warming Solutions Act of 2006 by requiring the state to further reduce GHG emissions to 40 percent below 1990 levels by 2030 (the other provisions of AB 32 remain unchanged). On December 14, 2017, the CARB adopted the 2017 Scoping Plan, which provides a framework for achieving the 2030 target. The 2017 Scoping Plan relies on the continuation and expansion of existing policies and regulations, such as the Cap-and-Trade Program, and implementation of recently adopted policies and legislation, such as SB 1383 and SB 100. The 2017 Scoping Plan also puts an increased emphasis on innovation, adoption of existing technology, and strategic investment to support its strategies. As with the 2013 Scoping Plan update, the 2017 Scoping Plan does not provide project-level thresholds for land use development. Instead, it recommends that local governments adopt policies and locally appropriate quantitative thresholds consistent with statewide per capita goals of 6 MT of $CO_2e$ by 2030 and 2 MT of $CO_2e$ by 2050 (CARB 2017). As stated in the 2017 Scoping Plan, these goals may be appropriate for plan-level analyses (city, county, sub-regional, or regional level), but not for specific individual projects because they include all emissions sectors in the state.

CARB published the Final 2022 Scoping Plan for Achieving Carbon Neutrality (2022 Scoping Plan Update) in November 2022, as the third update to the initial plan that was adopted in 2008. The 2022 Scoping Plan Update is the most comprehensive and far-reaching Scoping Plan developed to date. It identifies a technologically feasible, cost-effective, and equity-focused path to achieve new targets for carbon neutrality by 2045 and to reduce anthropogenic GHG emissions to at least 85 percent below 1990 levels, while also assessing the progress California is making toward reducing its GHG emissions by at least 40 percent below 1990 levels by 2030, as called for in SB 32 and laid out in the 2017 Scoping Plan (CARB 2022c). The 2030 target is an interim but important stepping-stone along the critical path to the broader goal of deep decarbonization by 2045. The relatively longer path assessed in the 2022 Scoping Plan Update incorporates, coordinates, and leverages many existing and ongoing efforts to reduce GHGs and air pollution, while identifying new clean technologies and energy. Given the focus on carbon neutrality, the 2022 Scoping Plan Update also includes discussion for the first time of the natural and working lands sectors as sources for both sequestration and carbon storage, and as sources of emissions as a result of wildfires.

The 2022 Scoping Plan Update reflects existing and recent direction in the Governor's Executive Orders and State Statutes, which identify policies, strategies, and regulations in support of and implementation of the Scoping Plan. Among these include Executive Order B-55-18 and AB 1279 (the California Climate

Crisis Act), which identify the carbon neutrality and GHG reduction targets for 2045 incorporated into the Scoping Plan.

### *Senate Bill 375*

The Sustainable Communities and Climate Protection Act of 2008 (SB 375), signed in August 2008, enhances the state's ability to reach AB 32 goals by directing CARB to develop regional GHG emission reduction targets to be achieved from passenger vehicles by 2020 and 2035. SB 375 aligns regional transportation planning efforts, regional GHG reduction targets, and affordable housing allocations. Metropolitan Planning Organizations (MPO) are required to adopt a Sustainable Communities Strategy (SCS), which allocates land uses in the MPO's Regional Transportation Plan (RTP). Qualified projects consistent with an approved SCS or Alternative Planning Strategy (categorized as "transit priority projects") can receive incentives to streamline CEQA processing.

On March 22, 2018, CARB adopted updated regional targets for reducing GHG emissions from 2005 levels by 2020 and 2035. The Fresno Council of Governments (FCOG) was assigned targets of a 6 percent reduction in per capita GHG emissions from passenger vehicles by 2020 and a 13 percent reduction in per capita GHG emissions from passenger vehicles by 2035 (CARB 2018a). The FCOG is the regional planning agency for Fresno County and serves as a forum for regional issues relating to transportation, the economy, community development, and the environment. FCOG most recently prepared the *2018 Regional Transportation Plan and Sustainable Communities Strategy* (2018 RTP/SCS) for the region. The plan quantified a 5 percent reduction by 2020 and a 10 percent reduction by 2035 (FCOG 2018). In 2018, CARB accepted FCOG's quantification of GHG reductions and its determination the SCS, if implemented, would achieve FCOG targets. Project consistency with the 2018 RTP/SCS would therefore support AB 32 and SB 32 GHG reduction goals.

The 2022 RTP/SCS (2022 RTP) was approved by the Fresno COG on July 28, 2022. The 2022 RTP/SCS comprehensively assess all forms of transportation available in Fresno County as well as travel and goods movement needed through 2046. Implementation of the goals set forth in the 2022 RTP will help achieve the state health standards and climate goals associated with transportation impacts.

### *Senate Bill 1383*

Adopted in September 2016, SB 1383 (Lara, Chapter 395, Statutes of 2016) requires CARB to approve and begin implementing a comprehensive strategy to reduce emissions of short-lived climate pollutants. SB 1383 requires the strategy to achieve the following reduction targets by 2030:

- Methane – 40 percent below 2013 levels
- Hydrofluorocarbons – 40 percent below 2013 levels
- Anthropogenic black carbon – 50 percent below 2013 levels

SB 1383 also requires the California Department of Resources Recycling and Recovery (CalRecycle), in consultation with CARB, to adopt regulations that achieve specified targets for reducing organic waste in landfills.

### *Senate Bill 100*

Adopted on September 10, 2018, SB 100 supports the reduction of GHG emissions from the electricity sector by accelerating the state's Renewables Portfolio Standard (RPS) Program, which was last updated by SB 350 in 2015. SB 100 requires electricity providers to increase procurement from eligible renewable energy resources to 33 percent of total retail sales by 2020, 60 percent by 2030, and 100 percent by 2045.

### *Executive Order B-55-18*

On September 10, 2018, former Governor Brown issued Executive Order B-55-18, which established a new statewide goal of achieving carbon neutrality by 2045 and maintaining net negative emissions thereafter. This goal is in addition to the existing statewide GHG reduction targets established by SB 375, SB 32, SB 1383, and SB 100.

### *17 California Code of Regulations Section 95350 et seq.*

In 2010, CARB adopted the *Regulation for Reducing Sulfur Hexafluoride Emissions From Gas Insulated Switchgear* (Section 17 CCR Section 95350 et seq.). The purpose of this regulation is to achieve GHG emission reductions by reducing $SF_6$ emissions from gas-insulated switchgear. Owners of such switchgear must not exceed maximum allowable annual emissions rates, reduced each year until 2020, after which annual emissions must not exceed 1 percent. Owners must regularly inventory gas-insulated switchgear equipment, measure quantities of $SF_6$, and maintain records of these for at least three years. Additionally, by June 1 each year, owners also must submit an annual report to CARB's Executive Officer for emissions that occurred during the previous calendar year.

In December 2021, CARB adopted amendments to the Regulation for Reducing Sulfur Hexafluoride Emissions from Gas Insulated Switchgear, to update the phase out of $SF_6$ in gas-insulated switchgear. The new phase out schedule begins in January 2025 with all switchgear needing to be $SF_6$ free by January 2033. Under this resolution, CARB has developed a timeline for phasing out $SF_6$ equipment in California and created incentives to encourage owners to replace $SF_6$ equipment. The California Office of Administrative Law approved this rulemaking in December 2021 and the Resolution went into effect January 1, 2022.

### *California Advanced Clean Trucks Program*

In March 2021, CARB approved the Advanced Clean Trucks regulation, which requires manufacturers who certify Class 2b-8 chassis or complete vehicles with combustion engines to sell zero-emission trucks as an increasing percentage of their annual California sales from 2024 to 2035. In addition, the regulation requires company and fleet reporting for large employers and fleet owners with 50 or more trucks. By 2045, all new trucks sold in California must be zero-emission. Implementation of this regulation would reduce consumption of nonrenewable transportation fuels as trucks transition to alternative fuel sources.

### *California Advanced Clean Fleets Regulation*

In April 2023, CARB approved the Advanced Clean Fleets (ACF) regulation. The ACF regulation is part of California's strategy to accelerate the adoption of medium- and heavy-duty zero-emission vehicles (ZEV). It complements the Advanced Clean Trucks ACT regulation and aims to achieve public health, air quality, and climate goals. The ACF regulation applies to fleets performing drayage operations, those owned by State, local, and federal government agencies, and high priority fleets. The ACF regulation includes components such as a manufacturer sales mandate, drayage fleet registrations, requirements for drayage fleets to transition to zero-emission vehicles, and mandates for high priority and government fleets to purchase increasing percentages of ZEVs over time. The regulation provides flexibility and exemptions for cases where zero-emission trucks are not yet available. The ACF regulation is expected to significantly increase the number of ZEVs on California roads, leading to emissions reductions and health benefits. The Advanced Clean Trucks and ACF regulations together are expected to result in about 510,000, 1,350,000 and 1,690,000 ZEVs in California in 2035, 2045, and 2050, respectively.

### *Executive Order B-48-18 (Zero-Emission Vehicles)*

On January 26, 2018, Governor Brown signed Executive Order B-48-18 requiring all State entities to work with the private sector to have at least 5 million ZEVs on the road by 2030, as well as install 200 hydrogen fueling stations and 250,000 electric vehicle (EV) charging stations by 2025. It specifies that 10,000 of the EV charging stations should be direct current fast chargers. This order also requires all State entities to continue to partner with local and regional governments to streamline the installation of ZEV infrastructure. The Governor's Office of Business and Economic Development is required to publish a Plug-in Charging Station Design Guidebook and update the 2015 Hydrogen Station Permitting Guidebook to aid in these efforts. All State entities are required to participate in updating the 2016 Zero-Emissions Vehicle Action Plan, along with the 2018 ZEV Action Plan Priorities Update, which includes and extends the 2016 ZEV Action Plan (Governor's Interagency Working Group on Zero-Emission Vehicles 2016, 2018), to help expand private investment in ZEV infrastructure with a focus on serving low-income and disadvantaged communities.

### *Executive Order N-79-20 (Zero Emissions Vehicles Sales)*

Governor Gavin Newsom signed Executive Order N-79-20 in September 2020, which sets a statewide goal that 100 percent of all new passenger car and truck sales in the state will be zero-emissions by 2035. It also sets a goal that 100 percent of statewide new sales of medium- and heavy-duty vehicles will be zero emissions by 2045, where feasible, and for all new sales of drayage trucks to be zero emissions by 2035. Additionally, the Executive Order targets 100 percent of new off-road vehicle sales in the state to be zero emission by 2035. CARB is responsible for implementing the new vehicle sales regulation.

### *Senate Bill 1020*

SB 1020 signed into law on September 16, 2022, requires renewable energy and zero-carbon resources to supply 90 percent of all retail electricity sales by 2035, 95 percent by 2040, and 100 percent by 2045. All State agencies facilities must be served by 100 percent renewable and zero-carbon resources by 2030. SB 1020 also requires the California Public Utilities Commission, CEC, and CARB to issue a joint progress report outlining the reliability of the electrical grid with a focus on summer reliability and challenges and gaps. Additionally, SB 1020 requires the California Public Utilities Commission to define energy affordability and use energy affordability metrics to develop protections, incentives, discounts, or new programs for residential customers facing hardships due to energy or gas bills.

## Local Regulations

### *Fresno Council of Governments*

As discussed above, the FCOG developed the 2022 RTP/SCS as the region's strategy to fulfill the requirements of SB 375. The 2022 RTP/SCS establishes a development pattern for the region that, when integrated with the transportation network and other policies and measures, would reduce GHG emissions from transportation (excluding goods movement). Specifically, the 2020 RTP/SCS is a financially feasible plan that achieves health standards for clean air and addresses climate goals set by the state. The 2022 RTP/SCS does not require local general plans, specific plans, or zoning be consistent with it but provides incentives for consistency for governments and developers. As discussed above under SB 375, FCOG the 2022-2045 RTP for was approved on July 28, 2022.

### *San Joaquin Valley Air Pollution Control District*

In August 2008, the SJVAPCD's Governing Board adopted the *Climate Change Action Plan* (SJVAPCD 2008b). The *Climate Change Action Plan* directed the SJVAPCD Air Pollution Control Officer to develop guidance to assist lead agencies, project proponents, permit applicants, and interested parties in assessing and reducing the impacts of project-specific GHG emissions on global climate change.

In 2009, the SJVAPCD adopted the *Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects Under CEQA* and the *District Policy – Addressing GHG Emission Impacts for Stationary Source Projects Under CEQA When Serving as the Lead Agency*. The guidance and policy rely on the use of performance-based standards, otherwise known as Best Performance Standards (BPS), to assess significance of project-specific GHG emissions on global climate change during the environmental review process, as required by CEQA (SJVAPCD 2009b; 2009c).

Use of BPS was a method for CEQA streamlining, but they were not required measures. Projects implementing BPS could be determined to have a less than cumulatively significant GHG impact. Another option was to demonstrate a 29 percent reduction in GHG emissions from business-as-usual (BAU) conditions to determine that a project would have a less than cumulatively significant impact and be consistent with AB 32 2020 targets. The guidance does not limit a lead agency's authority in establishing its own thresholds for determining the significance of project-related GHG impacts (SJVAPCD 2009c). Since SJVAPCD's recommended BPS method and 29 percent below BAU method were designed with 2020 GHG reduction targets in mind, compliance with these BPS or demonstration of 29 percent below BAU are no longer applicable to determining the significance of GHG impacts for projects developed after 2020.

### *Fresno County General Plan*

There are no specific policies related to GHG emissions or climate change in the Fresno County 2000 General Plan. The General Plan includes energy efficiency goals and policies applicable to new and existing housing. These would not apply to the Project.

# 3 Methodology and Significance Criteria

This section presents the methodology and significance criteria used for the analysis of construction, operational, and decommissioning emissions for the Project. Criteria pollutant and GHG emissions for Project construction and operation were calculated using the California Emissions Estimator Model (CalEEMod), Version 2022.1.1.19. CalEEMod is a statewide land use emissions computer model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify potential criteria pollutant and GHG emissions associated with both construction and operations from a variety of land use projects. CalEEMod allows for the use of default data (e.g., emission factors, trip lengths, meteorology, source inventory) provided by the various California air districts to account for local requirements and conditions, and/or user-defined inputs. The calculation methodology and input data used in CalEEMod can be found in the CalEEMod User's Guide Appendices A, D, and E (California Air Pollution Control Officers Association 2022). The input data and construction and operation emission estimates for the Project are discussed below and provided in Appendix N-1. Emissions calculations made outside CalEEMod, such as determination of emissions for helicopter usage, utility task vehicles (UTV) usage, determination of $SF_6$ consumption, and the compiled emissions profiles are included in Appendix N-2. CalEEMod output files for the Project are included in Appendix N-3. The estimated emissions were then compared to applicable significance criteria.

## 3.1 Methodology

### Construction Emissions

Construction emissions of criteria air pollutants and GHG include emissions generated by construction equipment used on-site and emissions generated by vehicle trips associated with construction, such as worker and vendor trips. CalEEMod estimates construction emissions by multiplying the amount of time equipment is in operation by emission factors.

As there are two possible construction scenarios, an 18-month construction scenario and a 36-month construction scenario were modeled. Emissions were analyzed for both scenarios to account for the differences in construction equipment and the duration of construction phasing. Construction of the Project was modeled based on the Applicant-provided construction schedule for each scenario.

Construction equipment was estimated to operate 8 hours per day and used horsepower information provided by the Applicant and the CalEEMod defaults for load factor. Vendor and haul trips were modeled as exclusively heavy heavy-duty truck trips. The analysis conservatively assumes a one-way distance of 160 miles to account for sourcing materials from California ports within the air basin for the air quality analysis; or up to 251 miles from the main site to California ports to inform the GHG analysis. Soils excavated during construction are assumed to be balanced on-site. This analysis assumes that the Project would comply with all applicable regulatory standards. In particular, the Project would comply with SJVACPD Rule 8021. Rule 8021 control measures for construction, demolition, excavation, extraction, and other earthmoving activities were included in the model with the assumption that watering would occur twice a day and the vehicle speed on unpaved roads onsite would be 15 miles per hour.

Detailed assumptions including schedule and phasing for each construction scenario is included in Appendix N-1. Table 5 below includes the anticipated construction phases and dates for each of the construction scenarios. Phase 6, Green Hydrogen Facility, has been removed from the Project but not from modeled results; therefore, overall emissions and emissions presented in this analysis are inclusive of the green hydrogen facility and considered conservative.

**Table 5 Construction Schedules**

| | 18-Month Scenario | | | 36-Month Scenario | | |
|---|---|---|---|---|---|---|
| Phase | Start | End | Days | Start | End | days |
| Solar Facility, Substation and Gen-Tie | | | | | | |
| Phase 1: Site Preparation | 12/31/2025 | 4/30/2026 | 90 | 12/31/2025 | 7/31/2026 | 140 |
| Phase 2: PV Panel System | 2/28/2026 | 6/28/2027 | 320 | 5/31/2026 | 6/30/2028 | 500 |
| Phase 3: Inverters, Transformers, Substation, and Electrical | 5/28/2026 | 3/28/2027 | 200 | 5/30/2027 | 5/30/2028 | 240 |
| Phase 4: Gen-Tie | 1/30/2026 | 6/30/2026 | 100 | 11/30/2027 | 5/30/2028 | 120 |
| BESS Facility (Phase 5) | 10/28/2026 | 4/28/2027 | 120 | 1/30/2028 | 9/30/2028 | 160 |
| ~~Green Hydrogen Facility (Phase 6)~~ | ~~9/28/2026~~ | ~~4/28/2027~~ | ~~140~~ | ~~2/29/2028~~ | ~~12/29/2028~~ | ~~200~~ |
| Utility Switchyard (Phase 7) | 2/28/2026 | 11/28/2026 | 180 | 5/31/2026 | 3/31/2027 | 200 |

## Operational Emissions

In CalEEMod, operational sources of criteria pollutant and GHG emissions include area, energy, and mobile sources. The first year of operation was assumed to be 2027 based on the potential for an 18-month construction schedule. The facilities were modeled as refrigerated warehouses of 3,946,800 square feet to account for the energy requirements for maintaining a stable temperature for optimum battery effectiveness, although this energy consumption is anticipated to be offset by the power generated at the site. The 10,400 square foot O&M building proposed for the solar facility was modeled as an office, It is anticipated that the majority of the facilities would be solar powered using the power generated at the facility itself.

CalEEMod defaults were used to estimate emissions from annual architectural coating and consumer products use for the O&M buildings.

Water will be pumped from on-site wells and treated on-site for use. The energy associated with pumping and treating water is incorporated in the electrical demand for the facilities and is therefore not quantified separately.

Solid waste generation was based on CalEEMod defaults for the two O&M buildings.[4] Diesel or gasoline-fueled on-site equipment, workers, worker trips, and haul trips associated with each of the operational activities are included in Table 6. Operational activities are anticipated to occur 10 hours per day. CEC Appendix B Item (E) GHG requires "The emission rates of criteria pollutants and greenhouse gases ($CO_2$, $CH_4$, $N_2O$, and SF6) from the stack, cooling towers, fuels and materials handling processes, delivery and storage systems, and from all on-site secondary emission sources." The project does not include stacks, cooling towers, fuels and materials handling processes or delivery and storage systems. The onsite emissions sources are from the on-site use of off-road construction equipment, helicopters, UTVs, fugitive emissions of $SF_6$ from circuit breakers, as well as building operations and

[4] This analysis originally anticipated the O&M building would be 160,000 square foot, which is included in the modeling. This results in conservative solid waste haul trip and area source-related emission calculations, as these emissions are based on building size and not project-specific information. Therefore, it is anticipated that emissions from these sources would be less than what is analyzed in this report.

employee vehicle trips. Emissions factors for helicopters, UTVs and $SF_6$ consumption are included in Appendix N-2. Emission factors for off-road construction equipment, building emissions, and employee vehicle commutes are imbedded in the CalEEMod model.

**Table 6 Daily Operational Equipment Usage, Workers, and Vehicle Trips**

| Phase | Daily Count[1] | Horsepower | Load factor |
|---|---|---|---|
| **Road and Fence Repair** | | | |
| Skid Steer Loaders | 1 | 65 | 0.37 |
| Forklifts | 1 | 89 | 0.2 |
| Off-Highway Trucks | 1 | 376 | 0.38 |
| Workers | 5 | N/A | N/A |
| Worker Trips | 10 | N/A | N/A |
| **Road Reconditioning** | | | |
| Graders | 1 | 187 | 0.41 |
| Scrapers | 1 | 423 | 0.48 |
| Tractors/Loaders/Backhoes | 2 | 97 | 0.37 |
| Pavers | 1 | 81 | 0.42 |
| Rollers | 1 | 80 | 0.38 |
| Off-Highway Trucks | 3 | 500 | 0.38 |
| Workers | 5 | N/A | N/A |
| Worker Trips | 10 | N/A | N/A |
| **Solar Panel Washing** | | | |
| Tractors/Loaders/Backhoes | 1 | 84 | 0.37 |
| Off-Highway Trucks | 1 | 500 | 0.38 |
| Workers | 17 | N/A | N/A |
| Worker Trips | 42.5 | N/A | N/A |
| **General Maintenance** | | | |
| Workers | 16 | N/A | N/A |
| Worker Trips | 40 | N/A | N/A |
| **Vegetation and Pest Management** | | | |
| Tractor | 12 | 84 | 0.37 |
| Workers | 12 | N/A | N/A |
| Worker Trips | 30 | N/A | N/A |

1. The daily count shown is the number of equipment, workers or worker trips by phase

### *$SF_6$ Emissions*

The project would include 500-kV circuit breakers that contain $SF_6$. New circuit breaker designs have been developed over the past several years to minimize the potential for leakage(CARB 2018b). In addition, the equipment would comply with CARB's *Reducing Sulfur Hexafluoride Emissions from Gas*

*Insulated Switchgear* regulations. CARB's current regulations require that switchgear not exceed a maximum allowable annual $SF_6$ emissions rate (leakage rate) of 1 percent. The only equipment within the substations and switchyards that would have $SF_6$ gas would be the up-to-26 500-kV circuit breakers. The utility switchyard would require five circuit breakers; the step-up substation would require nine. Each breaker would contain up to 1,500 pounds (lbs) of $SF_6$, for a total of up to 21,000 lbs of $SF_6$ gas.

## Methodology for Determining Health Risks

Health impacts associated with TACs are generally from long-term exposure. Typical sources of TACs include industrial processes such as petroleum refining operations, commercial operations such as gasoline stations and dry cleaners, and diesel exhaust. Health impacts from TAC emissions during the operational phase of the Project could result from the use of on-site diesel equipment during Project operation. In addition, the use of large-scale off-road diesel equipment during Project construction may result in a short-term increase of TAC emissions. DPM would be the TAC emitted in the largest quantity during construction and is the primary contaminant of concern for the Project. Thus, health risks were assessed as they relate to DPM exposure.

The significance of health risk impacts is based on the number of excess health risk relative to an established threshold. Health effects from carcinogenic air toxins usually are described in terms of cancer risk. Non-carcinogenic hazards include chronic and acute effects. Acute effects are due to short-term exposure, while chronic effects are due to long-term exposure to a substance. For chronic and acute risks, the hazard index is calculated as the summation of the hazard quotients for all chemicals to which an individual would be exposed. CEC defines acute and chronic exposure as follows (Title 20 CCR Section 1704, Appendix B):

- An acute exposure is one which occurs over a time period of less than or equal to 1 hour.
- A chronic exposure is one which is greater than 12 percent of a lifetime of 70 years.

Average concentrations of DPM at the highest exposed existing sensitive receptors were used to estimate potential chronic and carcinogenic health risk. The health risk calculations were based on the standardized equations contained in the current Air Toxics Hot Spots Program Risk Assessment Guidelines (Office of Environmental Health Hazard Assessment [OEHHA] 2015) and guidelines from the SJVAPCD *Update to District's Risk Management Policy to Address OEHHA's Revised Risk Assessment Guidance Document Final Staff Report* (SJVAPCD 2015d). Toxicity values for the pollutants of concern were acquired from the OEHHA *Air Toxics Hot Spots Program Risk Assessment Guidelines and Inhalation RELs*[5] (OEHHA 2015). OEHHA provides chronic inhalation reference exposure levels for DPM and does not provide acute inhalation reference exposure levels for health risk assessments; therefore, only chronic risk is analyzed herein. The carcinogenic health risk equations follow a dose response relationship where the dosage is averaged over a particular timeframe. To provide a conservative analysis, the timeframe for construction and decommissioning activities were assumed to be equivalent and no adjustments were made to the exposure duration (i.e., exposure duration 100 percent of the time was assumed). Additionally, the high-end breathing rate (95th percentile) by age bin was used and no fraction of time at residence was applied. To assess a reasonable worst-case scenario, it was assumed that an individual could be exposed to construction and operational emissions as infants and children, and operational and decommissioning emissions as an adult over the course of a 70-year lifetime. Children are more affected by DPM emissions than adults because of the greater amount of air that they breathe on a daily basis compared to their body weight.

[5] OEHHA Reference Exposure Levels (RELs) are updated regularly at www.oehha.ca.gov/air/Allrels.html

The air dispersion modeling for the health risk assessment was performed using the USEPA AERMOD dispersion model, version 18081, that is part of the Air Dispersion Modeling and Risk Tool (ADMRT) version 21081 created by CARB. AERMOD is a steady-state, multiple-source, Gaussian dispersion model. AERMOD requires hourly meteorological data consisting of wind vector, wind speed, temperature, stability class, and mixing height. For this analysis, AERMOD-ready meteorological data from the Mendota station (Station ID 99005), which was pre-processed with AERMET version 18081, was obtained from the SJVAPCD. The meteorological data is from the years 2007 through 2011. The meteorological station is approximately 17-miles northwest from the nearest point of the Project site and is representative of the conditions at the Project site. The meteorological data used in modeling and the wind rose are included in Appendix N-6.

Based on the anticipated construction schedule, the average workday would be approximately 10 hours for a 5-day per week schedule. Therefore, the emission rates were assumed to be limited to the hours of 7:00 a.m. to 5:00 p.m. every weekday. The model was run to obtain the maximum 1-hour and average concentration. A total of 4,590 modeling points were identified and included in the dispersion model, including 555 sensitive receptors (residences) at 25-meter spacing to provide adequate coverage for the sensitive receptors. The remaining non-sensitive receptor modeling points were spaced at 100-meter intervals that encompassed an area of approximately 1,000 feet beyond the project border and was used to evaluate the Project's potential health impact and to verify if the modeled sensitive receptors accounted for the highest off-site exposure or the point of maximum impact (PMI). Receptor and modeling locations are shown in Figure 3.

The total $PM_{10}$ exhaust emissions for all on-site diesel equipment and on-site mobile emissions for the entire construction and operational period were divided by the working days and working hours per day to determine the maximum hourly emission rate. AERMOD was used to determine the non-pollutant specific concentration at receptor points by source using a unit emission rate of 1 gram per second (g/sec)). The non-pollutant specific concentration was then multiplied by the actual pollutant specific emission rates (i.e., annual average in pounds per year and maximum hourly in pounds per hour) to determine the cumulative source ground-level pollutant specific concentration (GLC) at each receptor subsequently used to determine cancer and non-cancer health impacts using the CARB Hot Spots Analysis and Reporting Program Version 2 (HARP 2) version 22118E.[6] Chronic and carcinogenic health risk were further refined by age bin based on the USEPA (2005) guidance on the use of early life exposure adjustment factors (*Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens*, EPA/630/R-003F) and standardized dose algorithms contained in the current OEHHA guidance. Consistent with CEC requirements for health risk assessment (HRA), this analysis used HARP 2 and cancer potency values and noncancer reference exposure levels approved by OEHHA (Title 20 CCR Section 1704, Appendix B).

Because HARP 2 does not include an option to evaluate health risk using partial years (i.e., 18 months for construction and 36 months for construction and decommissioning), carcinogenic health risk results presented herein were calculated using several iterations of HARP 2 in order to conservatively address risk. Risk was determined by age bin for each construction phase. Note that the estimated concentration is not a specific prediction of the actual concentrations that would occur at any one point or any specific time over the course of the construction period. Actual concentrations are dependent on many variables, particularly the number and type of equipment working at specific distances during time periods of adverse meteorology. Various activities would occur at different Project sites throughout the overall Project, and equipment would be close to adjacent receptors for a limited period of time, and then several miles from the same receptor at other times. Appendix N-5 provides

[6] See Appendix F for AERMOD output files and GLC period files used to calculate health risk.

input and output data for the HARP 2 Analysis. Electronic files for the AERMOD and HARP 2 modeling will be provided to the CEC under separate cover.

### Methodology for Ambient Air Quality Analysis

A localized analysis following the SJVAPCD modeling guidance documents was conducted to assess the potential impacts of construction and operational activities (SJVAPCD 2022c, 2010, 2015a, 2019). Daily and annual emissions burdens were estimated for the duration of the construction period based on provided construction schedule, number of pieces of construction equipment, horsepower rating of construction equipment, utilization of construction equipment, engine exhaust certifications, and construction activities as modeled. Refined air dispersion modeling of the daily emissions was conducted using AERMOD to show the project's maximum localized impacts from pollutants where mitigation does not reduce impacts to below the SJVAPCD's screening level thresholds for the anticipated construction scenarios and for Project operation. Emissions in AERMOD were set to 1 gram per sec (g/sec) and emissions were scaled in a stand-alone spreadsheet to account for actual project emissions.

Only the maximum localized pollutant levels related to on-site construction and operational activities were estimated and verified through AERMOD modeling. Emissions from mobile construction equipment were modeled as line volume or volume sources based on the size of the area modeled.

To account for the impact of localized pollutants in combination with pollution from other sources, the modeled results were added to the background level as recommended by USEPA and SJVAPCD (SJVPACD 2010, USEPA 2017). Unique background levels are based on the specific details of the applicable standards. The resulting pollutant concentrations (modeled result and background) were then compared to the applicable NAAQS and CAAQS. Dispersion modeling parameters and the receptor grid were consistent with those used for the health risk assessment.

## 3.2 Significance Criteria

The significance criteria used to evaluate the Project impacts to air quality are based on the recommendations provided in Appendix G of the *CEQA Guidelines* (14 CCR 15000 et seq.). For the purposes of this air quality analysis, a significant impact would occur if the Project would:

1. Conflict with or obstruct implementation of the applicable air quality plan
2. Result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is nonattainment under an applicable federal or state ambient air quality standard
3. Expose sensitive receptors to substantial pollutant concentrations
4. Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people

### Annual Criteria Air Pollutant Emissions

Appendix G of the *CEQA Guidelines* (14 CCR 15000 et seq.) indicates that, where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied on to determine whether a project would have a significant impact on air quality. The SJVAPCD recommends the use of quantitative thresholds to determine the significance of temporary construction-related pollutant emissions and long-term operational-related pollutant emissions. These thresholds are shown in Table 7.

**Table 7 SJVAPCD Air Quality Significance Thresholds**

| Pollutant | Operation Thresholds (Tons per Year) | Construction Thresholds (Tons Per Year) |
|---|---|---|
| $NO_X$ | 10 | 10 |
| ROG[1] | 10 | 10 |
| $PM_{10}$ | 15 | 15 |
| $PM_{2.5}$ | 15 | 15 |
| $SO_X$ | 27 | 27 |
| CO | 100 | 100 |

[1] ROG are formed during combustion and evaporation of organic solvents. ROG are also referred to as VOC.
Source: San Joaquin Valley Air Pollution Control District 2015a

## Daily Criteria Air Pollutant Emissions

In addition to the annual SJVAPCD thresholds outlined above, SJVAPCD has published the *Ambient Air Quality Analysis Project Daily Emissions Assessment* guidance, which is summarized in Section 8.4.2, *Ambient Air Quality Screening Tools*, of the SJVAPCD's *Guidance for Assessing and Mitigating Air Quality Impacts (GAMAQI)*, adopted in March 2015.

SJVAPCD recommends comparing project attributes with the following screening criteria as a first step to evaluating whether the project would result in the generation of CO concentrations that could substantially contribute to an exceedance of the significance thresholds. The project could result in a significant impact to localized CO concentrations if (SJVAPCD 2015a):

1. A traffic study for the project indicates that the Level of Service (LOS) on one or more streets or at one or more intersections in the project vicinity will be reduced to LOS E or F
2. A traffic study indicates that the project will substantially worsen an already existing LOS F on one or more streets at more one or more intersections in the project vicinity

In addition to the criteria pollutant thresholds outlined above, SJVAPCD has published the *Ambient Air Quality Analysis Project Daily Emissions Assessment* guidance, which is summarized in Section 8.4.2, *Ambient Air Quality Screening Tools*, of the GAMAQI. The GAMAQI provides a screening threshold of 100 pounds per day of any of the following pollutants: $NO_X$, ROG, $PM_{10}$, $PM_{2.5}$, sulfur oxide ($SO_X$), and CO. The screening threshold was used to evaluate localized construction activities and operational activities separately. Per SJVAPCD's GAMAQI and Rule 9510 – Indirect Source Review, when assessing the significance of project-related impacts on local air quality, the impacts *may* be significant if on-site emissions from construction or operational activities exceed the 100 pounds per day screening level after implementation of all enforceable mitigation measures. The Project would be subject to Rule 9510 because it would develop more than 9,000 square feet, which is the ambient air quality analysis screening level threshold for unconventional land use developments not identified as residential, commercial, or industrial (e.g., a solar facility).

If the screening criteria is exceeded for any pollutant, an ambient air quality assessment (AAQA) can be conducted following District Rule 2201 *AAQA Modeling*. An AAQA uses air dispersion modeling to determine if emission increases from a project's construction or operational activities would cause or contribute to a violation of the ambient air quality standards. If modeled concentrations combined with background concentrations would result in an exceedance of a NAAQS or CAAQS, then SJVAPCD Rule 2201 requires that the maximum modeled concentration of each pollutant be compared to its corresponding Significant Impact Level (SIL). If modeled concentrations do not exceed the SIL, then the project would not result in a violation of ambient air quality standards and mitigation for that pollutant is not required. The SIL are identified in Table 8.

## Table 8 AAQA Localized Thresholds (µg/m³)

| | NAAQS | | | | CAAQS | | | | SIL | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Averaging Time** | **1hr** | **8hr** | **24 hr** | **Annual** | **1hr** | **8hr** | **24hr** | **Annual** | **1 hr** | **8 hr** | **24 hr** | **Annual** |
| $NO_2$ | 188 | - | - | 100 | 339 | - | - | 57 | 7.5 | - | - | 1 |
| CO | 40,000 | 10,000 | - | - | 23,000 | 10,000 | - | - | 2,000 | 500 | - | - |
| $SO_2$ | 196 | - | - | - | 655 | - | 105 | - | 7.8 | - | - | - |
| $PM_{10}$ Exhaust | - | - | - | - | - | - | - | - | - | - | 5 | 1 |
| $PM_{10}$ Fugitive | - | - | - | - | - | - | - | - | - | - | 10.4 | 2.1 |

$NO_2$ = nitrogen dioxide; CO = carbon monoxide; $PM_{10}$ = coarse particles of a diameter of 10 microns or less; SIL = Significant Impact Level; $SO_2$ = sulfur dioxide

Source: San Joaquin Valley Air Pollution Control District 2015a, 2019

## Health Risk

The SJVAPCD has also established thresholds for health effects from carcinogenic and non-carcinogenic air toxics. The SJVAPCD recommends a carcinogenic (cancer) risk threshold of 20 in a million. The Chronic Hazard Index (HIC) is the sum of the individual substance chronic hazard indices for all TACs affecting the same target organ system. The SJVAPCD recommends a HIC significance threshold of 1.0 and an acute hazard index (HIA) of 1.0. No short-term, acute relative exposure values are established and regulated for DPM; therefore, acute exposure is not addressed in the HRA.

## Greenhouse Gases

The significance criteria used to evaluate the Project impacts to GHG emissions are based on the recommendations provided in Appendix G of the *CEQA Guidelines* (14 CCR 15000 et seq.). For the purposes of the GHG analysis, a significant impact would occur if the Project would:

1. Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment
2. Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs

The majority of individual projects do not generate sufficient GHG emissions to directly influence climate change. However, physical changes caused by a project can contribute incrementally to cumulative effects that are significant, even if individual changes resulting from a project are limited. The issue of climate change typically involves an analysis of whether a project's contribution towards an impact would be cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, other current projects, and probable future projects (*CEQA Guidelines*, Section 15064[h][1]).

### *Project-Level Significance Threshold*

For future projects, the significance of GHG emissions may be evaluated based on locally adopted quantitative thresholds, consistency with a regional GHG reduction plan, or consistency with statewide regulations adopted to reduce GHG emissions. A project may be found to have a less than significant impact related to GHG emissions if it complies with an adopted plan that includes specific measures to sufficiently reduce GHG emissions (14 CCR Section 15064[h][3]). According to the *CEQA Guidelines*, projects can tier from a qualified GHG reduction plan, which allows for project-level evaluation of GHG emissions through the comparison of the project's consistency with the GHG reduction policies included in that plan. The Association of Environmental Professionals considers this approach in its white paper, "Beyond Newhall and 2020," to be the most defensible approach presently available under CEQA to determine the significance of a project's GHG emissions (Association of Environmental Professionals 2016). However, the SJVAPCD's current GHG reduction strategy presented in the 2008 *Climate Change Action Plan* is based on AB 32 2020 emissions targets and does not address the SB 32 2030 emissions targets or AB 1279 2045 emissions targets. Because the GHG reduction plan does not specifically address the 2030 or 2045 targets and the project would become operational after 2020, tiering from the regional 2008 *Climate Change Action Plan* is not applicable.

Instead, the potential for the Project to conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing emissions of GHG was assessed by examining the Project's consistency with the GHG reduction measures detailed in CARB's 2022 Climate Change Scoping Plan. Under the

SJVAPCD's CEQA guidance for GHG, a project would not have a significant GHG impact if it is consistent with an applicable plan to reduce GHG emissions, and a CEQA compliant analysis was completed for the GHG reduction plan (SJVAPCD 2009b, 2015a). Project GHG emissions are quantified for informational purposes.

# 4 Impact Analysis

## 4.1 Project-Level Air Quality Impacts

| **Threshold 1:** | Would the Project conflict with or obstruct implementation of the applicable air quality plan? |
|---|---|

**Impact AQ-1 THE PROJECT WOULD CONFLICT WITH OR OBSTRUCT IMPLEMENTATION OF THE 2020 REASONABLY AVAILABLE CONTROL TECHNOLOGY (RACT) DEMONSTRATION FOR THE 2015 8-HOUR OZONE STANDARD AND THE 2013 PLAN FOR THE REVOKED 1-HOUR OZONE STANDARD, 2007 $PM_{10}$ MAINTENANCE PLAN AND REQUEST FOR RE-DESIGNATION, 2012 $PM_{2.5}$ PLAN, AND 2015 PLAN FOR THE 1997 $PM_{2.5}$ STANDARD WITHOUT MITIGATION. IMPACTS WOULD BE LESS THAN SIGNIFICANT WITH INCORPORATION OF MITIGATION.**

### Air Quality Management Plan Consistency

Construction, operation, and decommissioning of the Project would result in emissions of criteria pollutants including ozone precursors (such as ROG and $NO_X$) and PM. The SJVAPCD has prepared several air quality attainment plans to achieve ozone and particulate matter standards, the most recent of which include the *2020 Reasonably Available Control Technology (RACT) Demonstration for the 2015 8-Hour Ozone Standard* and the *2013 Plan for the Revoked 1-Hour Ozone Standard, 2007 $PM_{10}$ Maintenance Plan and Request for Re-designation, 2012 $PM_{2.5}$ Plan,* and *2015 Plan for the 1997 $PM_{2.5}$ Standard*. The SJVAB is in attainment for CO, $SO_2$, and Pb, and there are no attainment plans for those pollutants.

Per Section 7.12 of the *GAMAQI*, the SJVAPCD has determined that projects with emissions above the thresholds of significance for criteria pollutants would conflict with/obstruct implementation of the SJVAPCD's air quality plans (SJVAPCD 2015a). As discussed under Impact AQ-2, project construction and decommissioning would exceed $NO_X$ and PM annual significance thresholds for construction activities. Therefore, Project construction and decommissioning has the potential to conflict with existing air quality plans. Operational activities would not exceed the SJVAPCD thresholds for $NO_X$ and PM. Operation emissions would not conflict with implementation of existing air quality plans at a local level.

### Mitigation

The following mitigation measures would reduce impacts from $NO_X$ and PM. Implementation of Mitigation Measures AQ-1 and AQ-2 would reduce $NO_X$ and PM emissions from construction activities.

***Mitigation Measure AQ-1: Voluntary Emission Reduction Agreement***

The Applicant shall enter into a voluntary emissions reduction agreement (VERA) with the SJVAPCD to offset the $NO_X$ emissions above the 10 tons per year threshold. The VERA is a mechanism for the Applicant to fund programs to reduce $NO_X$ emissions in the SJVAB. The Applicant shall coordinate with SJVAPCD to ensure VERA funds are used for programs near the Project site to the extent feasible. The VERA shall be submitted and approved by the SJVAPCD prior to beginning construction activities.

If available and as feasible, electric equipment could be incorporated into the off-road equipment fleet to reduce $NO_X$ emissions that must be offset with the required VERA. In order to reduce the $NO_X$ emissions that must be offset with the required VERA, the Applicant shall provide commitment to available electric equipment to the CEC and the SJVAPCD prior to the issuance of a permit to construct and quantify the emissions reductions from the electric equipment. Documentation of the equipment operating on-site, shall be maintained on-site at all times during construction and decommissioning activities.

***Mitigation Measure AQ-2: Fugitive Dust Control Plan***

Prior to construction and decommissioning activities, the Applicant shall prepare a Fugitive Dust Control Plan. At a minimum, the Plan shall include the following: Control fugitive dust onsite during construction and decommissioning with a minimum of one watering across the site daily with the use of chemical stabilizers during construction activities. Additional water/chemical treatments will occur as needed based on daily site conditions and ground disturbance activities. Roads and other areas that experience high traffic volumes may be stabilized with water and/or chemicals up to four times a day. The method of monitoring site conditions for additional dust control needs shall be detailed in the plan. Chemical stabilizers shall be used for long-term fugitive dust control onsite. Specific stabilizers proposed for use and their location shall be included in the fugitive dust control plan for the project and records of watering and stabilizer application shall be kept. $PM_{10}$ reduction quantifications from this measure are to be applied prior to the finalization of a VERA for the Project.

## Significance after Mitigation

Implementation of Mitigation Measures AQ-1 and AQ-2 would reduce $NO_X$ and PM emissions from construction activities to below significance thresholds. Therefore, with the implementation of Mitigation Measure AQ-1 and AQ-2 the Project would not conflict with an applicable air quality plan and impacts would be less than significant.

| | |
|---|---|
| **Threshold 2** | Would the Project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard? |

**Impact AQ-2 PROJECT OPERATION WOULD NOT RESULT IN A CUMULATIVELY CONSIDERABLE NET INCREASE OF A CRITERIA POLLUTANT FOR WHICH THE PROJECT REGION IS IN NON-ATTAINMENT UNDER AN APPLICABLE FEDERAL OR STATE AMBIENT AIR QUALITY STANDARD. HOWEVER, PROJECT CONSTRUCTION ACTIVITIES WOULD EXCEED SIGNIFICANCE THRESHOLDS FOR $NO_X$, $PM_{10}$ AND $PM_{2.5}$, WHICH WOULD RESULT IN A CUMULATIVELY CONSIDERABLE NET IMPACT WITHOUT MITIGATION. IMPACTS WOULD BE LESS THAN SIGNIFICANT WITH THE IMPLEMENTATION OF MITIGATION.**

## Construction Impacts

### *Annual Criteria Air Pollutant Emissions*

Construction of the Project would require approximately 18 to 36 months of construction activity depending on the final construction scenario chosen. Construction would involve several overlapping phases. Refer to Table 5 in Section 3.1 for phasing specifics related to the Project construction schedule. Construction of the Project would generate air pollutant emissions from entrained dust, off-road equipment use, vehicle emissions, and architectural coatings. Off-site emissions would be generated by construction worker daily commute trips and heavy-duty diesel haul and vendor truck trips. Construction emissions would vary substantially from day to day, depending on the level of activity, the specific type of operation, and, for dust, the prevailing weather conditions. Table 9 shows the estimated annual construction emissions by construction phase and by year. The majority of PM emissions are fugitive emissions. As shown, for both the 18-Month and 36-Month construction scenarios, $NO_X$ and CO emissions exceed significance thresholds. In addition, the 18-Month construction scenario exceeds the annual $PM_{10}$ emissions threshold. Because annual emissions from Project construction would exceed significance thresholds, the Project could contribute cumulatively to a net increase in criteria pollutants without mitigation. Impacts would be potentially significant.

The green hydrogen facility in Phase 6 has since been removed from the Project. This change reduces the emissions shown in Table 9; however, removal of the hydrogen facility does not change the exceedance of thresholds for $NO_x$ and CO.

### Table 9 Annual Construction Emissions

| Phase | | Emissions (tons per year by phase) | | | | | |
|---|---|---|---|---|---|---|---|
| | | ROG | $NO_X$ | CO | $SO_X$ | $PM_{10}$ | $PM_{2.5}$ |
| **36-Month Construction Scenario – By Phase** | | | | | | | |
| Phase 1: Site Preparation | | 0.62 | 5.52 | 29.93 | 0.06 | 3.60 | 1.81 |
| Phase 2: PV Panel System | | 2.69 | **32.33** | **108.22** | 0.19 | 5.35 | 2.33 |
| Phase 3: Inverters, Transformers, Substation, and Electrical | | 0.67 | 8.87 | 29.85 | 0.21 | 0.78 | 0.44 |
| Phase 4: Gen-Tie | | 0.86 | 9.22 | 8.73 | 0.53 | 1.09 | 0.91 |
| Phase 5: BESS | | 0.21 | 5.05 | 6.82 | 0.04 | 0.75 | 0.25 |
| ~~Phase 6: Green Hydrogen Facility~~ | | ~~1.61~~ | **~~20.07~~** | ~~81.29~~ | ~~0.16~~ | ~~5.03~~ | ~~2.31~~ |
| Phase 7: Utility Switchyard | | 0.54 | 6.57 | 25.36 | 0.05 | 1.12 | 0.54 |
| Threshold | | 10 | 10 | 100 | 27 | 15 | 15 |
| Exceed Threshold? | | No | **Yes** | **Yes** | No | No | No |
| **36-Month Construction Scenario – By Year** | | | | | | | |
| 2025 | Solar Facility, Step-Up Substation, and Gen-Tie (Phases 1 to 4) | 0.02 | 0.05 | 0.30 | 0.02 | 0.04 | 0.03 |
| 2026 | Solar Facility, Step-Up Substation, and Gen-Tie (Phases 1 to 4) | 2.23 | 24.77 | 93.90 | 0.19 | 6.73 | 3.19 |
| | Utility Switchyard (Phase 7) | 0.54 | 6.57 | 25.36 | 0.05 | 1.12 | 0.54 |
| | **Total 2026** | **2.77** | **31.34** | **119.25** | **0.24** | **7.85** | **3.74** |
| 2027 | Solar Facility, Step-Up Substation, and Gen-Tie (Phases 1 to 4) | 3.38 | 41.36 | 138.11 | 0.25 | 6.19 | 2.65 |
| | Utility Switchyard(Phase 7) | 0.16 | 1.94 | 7.55 | 0.02 | 0.33 | 0.17 |
| | **Total 2027** | **3.54** | **43.30** | **145.65** | **0.28** | **6.52** | **2.83** |
| 2028 | Solar Facility, Step-Up Substation, and Gen-Tie (Phases 1 to 4) | 2.38 | 27.07 | 62.56 | 0.80 | 3.58 | 2.12 |
| | BESS (Phase 5) | 0.21 | 5.05 | 6.82 | 0.04 | 0.75 | 0.25 |
| | ~~Green Hydrogen Facility (Phase 6)~~ | ~~1.61~~ | ~~20.07~~ | ~~81.29~~ | ~~0.16~~ | ~~5.03~~ | ~~2.31~~ |
| | **Total 2028** | **4.21** | **52.19** | **150.67** | **0.99** | **9.36** | **4.68** |
| Maximum Annual | | 4.21 | **52.19** | **150.67** | 0.99 | 9.36 | 4.68 |
| Threshold | | 10 | 10 | 100 | 27 | 15 | 15 |
| Exceed Threshold? | | No | **Yes** | **Yes** | No | No | No |

| Phase | | Emissions (tons per year by phase) | | | | | |
|---|---|---|---|---|---|---|---|
| | | ROG | $NO_X$ | CO | $SO_X$ | $PM_{10}$ | $PM_{2.5}$ |
| **18-Month Construction Scenario – By Phase** | | | | | | | |
| Phase 1: Site Preparation | | 1.82 | **19.02** | 31.36 | 0.06 | 5.39 | 2.92 |
| Phase 2: PV Panel System | | 2.95 | **32.25** | **131.90** | 0.20 | 6.47 | 3.01 |
| Phase 3: Inverters, Transformers, Substation, and Electrical | | 1.06 | **12.84** | 38.05 | 0.24 | 1.21 | 0.62 |
| Phase 4: Gen-Tie | | 1.14 | 12.05 | 11.21 | 0.71 | 1.42 | 1.21 |
| Phase 5: BESS | | 0.22 | 4.39 | 10.02 | 0.02 | 0.46 | 0.15 |
| ~~Phase 6: Green Hydrogen Facility~~ | | ~~0.68~~ | ~~8.92~~ | ~~33.42~~ | ~~0.08~~ | ~~3.05~~ | ~~1.43~~ |
| Phase 7: Utility Switchyard | | 0.82 | 9.76 | 31.77 | 0.07 | 2.10 | 1.05 |
| Threshold | | 10 | 10 | 100 | 27 | 15 | 15 |
| Exceed Threshold? | | No | **Yes** | **Yes** | No | No | No |
| **18-Month Construction Scenario – By Year** | | | | | | | |
| 2025 | Solar Facility, Step-Up Substation, and Gen-Tie (Phases 1 to 4) | 0.03 | 0.17 | 0.42 | 0.01 | 0.07 | 0.04 |
| 2026 | Solar Facility, Step-Up Substation, and Gen-Tie (Phases 1 to 4) | 6.97 | 76.16 | 212.52 | 1.21 | 14.49 | 7.76 |
| | BESS (Phase 5) | 0.15 | 2.82 | 6.37 | 0.02 | 0.30 | 0.11 |
| | ~~Green Hydrogen Facility (Phase 6)~~ | ~~0.66~~ | ~~8.62~~ | ~~32.30~~ | ~~0.08~~ | ~~2.91~~ | ~~1.34~~ |
| | **Total 2026** | **7.78** | **87.60** | **251.20** | **1.31** | **17.70** | **9.22** |
| 2027 | Solar Facility, Step-Up Substation, and Gen-Tie (Phases 1 to 4) | 1.59 | 17.73 | 70.52 | 0.14 | 3.23 | 1.48 |
| | BESS (Phase 5) | 0.22 | 4.39 | 10.02 | 0.02 | 0.46 | 0.15 |
| | ~~Green Hydrogen Facility (Phase 6)~~ | ~~0.68~~ | ~~8.92~~ | ~~33.42~~ | ~~0.08~~ | ~~3.05~~ | ~~1.43~~ |
| | Utility Switchyard (Phase 7) | 0.82 | 9.76 | 31.77 | 0.07 | 2.10 | 1.05 |
| | **Total 2027** | **3.31** | **40.80** | **145.74** | **0.31** | **8.84** | **4.11** |
| Maximum Annual | | 7.78 | **87.60** | **251.20** | 1.31 | **17.70** | 9.22 |
| Threshold | | 10 | 10 | 100 | 27 | 15 | 15 |
| Exceed Threshold? | | No | **Yes** | **Yes** | No | **Yes** | No |

$NO_X$= Nitrous Oxides; ROG = Reactive Organic Gases; $PM_{10}$ = Particulate matter with a diameter of 10 microns or less; $PM_{1.5}$ = Particulate Matter with a diameter of 2.5 microns or less

Notes: Rounded values shown; columns may not total exactly. See Appendix N-2 for calculations. Bold numbers indicate an exceedance of applicable thresholds.

The Project would comply with SJVAPCD Rule 9510, Indirect Source Review, which requires large development projects to reduce exhaust emissions from construction equipment by 20 percent for $NO_X$ and 45 percent for $PM_{10}$ compared to the statewide average, or demonstrate use of a clean fleet (such US EPA Tier 4 equipment). Because the Project would use all US EPA Tier 4 equipment, the project is consistent with Rule 9510, Indirect Source Review. Compliance with SJVAPCD Rule 9510 does not result in additional emissions reductions quantification for this environmental analysis because the Project would use all US EPA Tier 4 equipment, which is accounted for in this air quality modeling. Further, in addition to the Rule 9510 requirement, the Project would comply with dust mitigation per Rule 8021 which would reduce dust emissions. Requirements of Rule 8021 are detailed in the Regional Setting above; the Project's fugitive dust control plan would comply with all applicable measures required by SJVAPCD in Rule 8021.

### *Daily Criteria Air Pollutant Emissions*

The SJVAB is a nonattainment area for ozone, $PM_{10}$, and $PM_{2.5}$ under the NAAQS and/or CAAQS. The current air quality in the SJVAB is the result of cumulative emissions from motor vehicles, off-road equipment, commercial and industrial facilities, and other emission sources. Projects that emit these pollutants or their precursors (i.e., ROG and $NO_X$ for ozone) potentially contribute to poor air quality. Construction activities would exceed the SJVAPCD's recommended 100 pounds per day screening threshold during construction, as shown in Table 10, for $NO_X$ and CO for the 36-Month construction scenario and for $NO_X$, CO, $PM_{10}$, and $PM_{2.5}$ for the 18-Month construction scenario. Because daily emissions from Project construction would exceed significance thresholds, the Project could contribute cumulatively to a net increase in criteria pollutants without mitigation. Impacts would be potentially significant.

The green hydrogen facility has since been removed from the Project. This change reduces the emissions shown in in Table 10; however, removal of the hydrogen facility does not change the exceedance of thresholds for $NO_x$ and CO.

**Table 10 Maximum Daily Construction Emissions**

| | Emissions (lbs/day) by year | | | | | |
|---|---|---|---|---|---|---|
| | ROG | $NO_X$ | CO | $SO_X$ | $PM_{10}$[1] | $PM_{2.5}$[1] |
| **36-Month Construction Schedule** | | | | | | |
| 2025 | 9 | 76 | **427** | 1 | 51 | 26 |
| 2026 | 37 | **379** | **1,570** | 3 | 98 | 48 |
| 2027 | 30 | **364** | **1,244** | 2 | 48 | 22 |
| 2028 | 49 | **574** | **2,139** | 4 | 89 | 41 |
| Maximum Daily | 49 | **574** | **2,139** | 4 | 89 | 41 |
| Screening Level | 100 | 100 | 100 | 100 | 100 | 100 |
| Exceeds Screening Level? | No | **Yes** | **Yes** | No | No | No |
| **18-Month Construction Schedule** | | | | | | |
| 2025 | 38 | **389** | **637** | 1 | **117** | 64 |
| 2026 | 79 | **857** | **3,175** | 5 | **201** | **104** |
| 2027 | 60 | **708** | **2,817** | 5 | **145** | 68 |
| Maximum Daily | 79 | **857** | **3,175** | 5 | **201** | **104** |
| Screening Level | 100 | 100 | 100 | 100 | 100 | 100 |
| Exceeds Screening Level? | No | **Yes** | **Yes** | No | **Yes** | **Yes** |

[1]Includes compliance with Rule 8021 dust control measures, which accounts for watering.

Bold values indicate where thresholds are exceeded.

Lbs/day = pounds per day; $NO_X$= Nitrous Oxides; ROG = Reactive Organic Gases; $PM_{10}$ = Particulate matter with a diameter of 10 microns or less; $PM_{1.5}$ = Particulate Matter with a diameter of 2.5 microns or less

### *Ambient Air Quality Impact Assessment*

As shown in Table 16, mitigation would reduce $NO_X$, $PM_{10}$ and $PM_{2.5}$ to below the 100 pounds per day threshold. Therefore, only CO would remain above the screening level and would be subject to an AAQA to determine whether modeled concentrations of CO from Project construction combined with background concentrations would result in an exceedance of a NAAQS or CAAQS. As shown in Table 11, unmitigated Project construction would not exceed the SJVAPCD NAAQS or CAAQS ambient daily concentrations for CO under any construction schedule. While CO impacts exceed regional thresholds, the AAQA demonstrates that Project construction emissions of CO would not exceed the ambient air quality standards and, therefore, would not result in significant impacts. The green hydrogen facility, which is included in the Option I Project Components in Table 11, has since been removed from the Project; the removal of this component does not change that the Project would not exceed the thresholds shown in Table 11.

**Table 11 Maximum Refined Daily Construction Emissions**

| Pollutant | Averaging Period | (μg/m³) Background | Project | Project + Background | CAAQS | NAAQS | SIL | Exceed |
|---|---|---|---|---|---|---|---|---|
| CO | 1hr | 3,986.7 | 2,100 | 6,087 | 23,000 | 40,000 | 2,000 | No |
| | 8hr | 2,864.0 | 691 | 3,555 | 10,000 | 10,000 | 500 | No |
| **18 Month Construction Schedule -Option 1 Project Components** | | | | | | | | |
| CO | 1hr | 3,986.7 | 7,781 | 11,768 | 23,000 | 40,000 | 2,000 | No |
| | 8hr | 2,864.0 | 1,610 | 4,474 | 10,000 | 10,000 | 500 | No |

Concentration calculations are included in Appendix N-6 and N-7.

## Operational Impacts

### *Annual and Daily Criteria Air Pollutants*

The Project would have up to 16 personnel on-site daily depending on the activities that would occur during that day. As a conservative estimate of daily emissions, it was assumed that all activities associated with the operational phase could occur on the same day resulting in 53 personnel accessing the site during a given day. Annual emissions are based on the average days of activity for each operational and maintenance activity. The analysis also accounts for occasional equipment and material delivery. The proposed solar facility would include one to two O&M buildings. As shown in Table 12, operational emissions from the Project would not exceed SJVAPCD annual thresholds for any criteria pollutant. As shown in Table 13, daily thresholds for CO would be exceeded and an AAQA was conducted (detailed below under *Ambient Air Quality Impact Assessment)* to determine if impacts would exceed the NAAQS or CAAQS. Operation and maintenance of the utility switchyard would be performed remotely by PG&E and therefore would result in nominal emissions from infrequent vehicle trips to and from the utility switchyard during operation. No diesel generators or other non-electric equipment would be used that result in emissions of criteria air pollutants. The green hydrogen facility has since been removed from the Project, which reduces the number of on-site personnel and daily traffic trips. The removal of this component does not change that the Project would not exceed the thresholds shown in Table 12, nor does it change that the Project would exceed the threshold for CO shown in Table 13.

## Table 12 Estimated Annual Operational Emissions

| Source | Emissions | | | | | |
|---|---|---|---|---|---|---|
| | ROG | $NO_X$ | CO | $SO_X$ | $PM_{10}$ | $PM_{2.5}$ |
| Solar Facility | 1.25 | 0.33 | 2.79 | 5.08 | 0.07 | 0.03 |
| Road and Fence Repair | 0.02 | 0.08 | 0.11 | 0.01 | 0.01 | 0.01 |
| Road Reconditioning | 0.07 | 0.50 | 0.70 | <0.01 | 0.06 | 0.03 |
| Solar Panel Washing | 0.05 | 0.27 | 0.44 | 0.01 | 0.02 | 0.02 |
| Vegetation and Pest Management | 0.2 | 1.95 | 3.84 | 0.01 | 0.08 | 0.06 |
| ~~Green Hydrogen Facility Personnel~~ | ~~0.77~~ | ~~0.71~~ | ~~1.90~~ | ~~1.99~~ | ~~0.07~~ | ~~0.02~~ |
| Total (tons/year) | 2.02 | 1.04 | 4.69 | 7.07 | 0.14 | 0.04 |
| Threshold | 10 | 10 | 27 | 100 | 15 | 15 |
| Exceed Threshold? | No | No | No | No | No | No |
| ~~Alternate Green Hydrogen Facility O&M Building~~ | ~~0.04~~ | ~~0~~ | ~~0~~ | ~~0~~ | ~~0~~ | ~~0~~ |
| ~~Green Hydrogen Facility Personnel~~ | ~~0.77~~ | ~~0.71~~ | ~~1.90~~ | ~~1.99~~ | ~~0.07~~ | ~~0.02~~ |
| Solar Facility | 1.25 | 0.33 | 2.79 | 5.08 | 0.07 | 0.03 |
| Total (tons/year) | 2.07 | 1.04 | 4.69 | 7.07 | 0.14 | 0.04 |
| Threshold | 10 | 10 | 27 | 100 | 15 | 15 |
| Exceed Threshold? | No | No | No | No | No | No |

$NO_X$= Nitrous Oxides; ROG = Reactive Organic Gases; $PM_{10}$ = Particulate matter with a diameter of 10 microns or less; $PM_{1.5}$ = Particulate Matter with a diameter of 2.5 microns or less; lbs/day = pounds per day

Totals may not add up due to rounding vehicles. See Appendix N-2 for calculations.

## Table 13 Estimated Daily Operational Emissions

| Source | Emissions (lbs/day) | | | | | |
|---|---|---|---|---|---|---|
| | ROG | $NO_X$ | CO | $SO_X$ | $PM_{10}$ | $PM_{2.5}$ |
| Option 1 Total Daily Operations | 15.77 | 86.06 | 127.15 | 0.24 | 7.90 | 4.23 |
| *SJVAPCD Operational Threshold* | *100* | *100* | *100* | *100* | *100* | *100* |
| Exceed Threshold? | No | No | **Yes** | No | No | No |
| ~~Alternate Green Hydrogen Total Daily Operations~~ | ~~30.79~~ | ~~86.06~~ | ~~127.15~~ | ~~0.24~~ | ~~7.90~~ | ~~4.23~~ |
| ~~*SJVAPCD Operational Threshold*~~ | ~~*100*~~ | ~~*100*~~ | ~~*100*~~ | ~~*100*~~ | ~~*100*~~ | ~~*100*~~ |
| ~~Exceed Threshold?~~ | ~~No~~ | ~~No~~ | ~~**Yes**~~ | ~~No~~ | ~~No~~ | ~~No~~ |

$NO_X$= Nitrous Oxides; ROG = Reactive Organic Gases; $PM_{10}$ = Particulate matter with a diameter of 10 microns or less; $PM_{1.5}$ = Particulate Matter with a diameter of 2.5 microns or less; lbs/day = pounds per day

Totals may not add up due to rounding vehicles. See Appendix N-2 for calculations. Bold numbers indicate an exceedance of applicable thresholds.

### *Ambient Air Quality Impact Assessment*

Operational activities would exceed the SJVAPCD's recommended 100 pounds per day screening threshold for CO as shown in Table 12. Therefore, an AAQA for CO was conducted for operational activities. As shown in Table 14, Project operation would not exceed the NAAQS or CAAQS ambient concentrations. Therefore, emissions of CO during Project operation would not contribute substantially to an existing or projected air quality violation. Impacts would be less than significant. The green hydrogen facility has since been removed from the Project; the removal of this component does not change that the Project would not exceed the thresholds shown in Table 14.

**Table 14 Maximum Refined Daily Operational Emissions**

| Pollutant | Averaging Period | (μg/m³) Background | Project | Project + Background | CAAQS | NAAQS | SIL | Exceed |
|---|---|---|---|---|---|---|---|---|
| CO | 1hr | 3,986.7 | 53.2 | 4039.9 | 23,000 | 40,000 | NA | No |
| | 8hr | 2,864.0 | 14.9 | 2878.9 | 10,000 | 10,000 | NA | No |

NA = not applicable

Concentrations determination included in Appendix N-6 and N-7.

## Decommissioning Impacts

Decommissioning activities at the end of the Project's useful life (anticipated to be 35 years) would completely remove all project components from the site, except for the utility switchyard. At this time, it is not possible to quantitatively evaluate potential air quality impacts that would result from Project decommissioning since technology and construction practices available at that time would be speculative. Therefore, based on current decommissioning practices and as a reasonable worst-case scenario, this analysis assumes that air quality impacts generated during future decommissioning would be similar to air quality impacts generated during the construction phase of the Project.

The Project would comply with SJVAPCD Rule 8021, which requires implementation of dust control measures, and SJVAPCD Rule 9510, Indirect Source Review, which requires reduction of engine exhaust emissions of $NO_X$ and $PM_{10}$. Moreover, emissions would be reduced due to the more stringent USEPA emission standards for diesel engines and cleaner vehicles in later years. As such, decommissioning activities on the Project site could result in exceedances of SJVAPCD thresholds for $NO_X$, $PM_{10}$, and $PM_{2.5}$ for an 18-month decommissioning phase similar to construction activities and would result in potentially significant impacts.

## Mitigation

Implement Mitigation Measures AQ-1 to AQ-2 to reduce $NO_X$, $PM_{2.5}$ and $PM_{10}$ emissions from construction activities.

## Significance after Mitigation

Implementation of Mitigation Measures AQ-1 and AQ-2 would reduce $NO_X$ emissions from the 36-month construction schedule and $NO_X$, $PM_{10}$, and $PM_{2.5}$ emissions from the 18-Month construction schedule to below significance thresholds. Table 15 shows mitigated construction emissions. While CO impacts exceed regional thresholds, the Ambient Air Quality Analysis demonstrates that CO impacts would not exceed the ambient air quality standards and, therefore, would not result in significant impacts. As shown in Table 16, implementation of Mitigation Measures AQ-1 and AQ-2 would reduce impacts to less than significant levels for NOx, PM10 and PM2.5. CO exceedances of daily thresholds are analyzed as part of an Ambient Air Quality Analysis as discussed above, and as shown in Table 11, unmitigated CO emissions would not exceed AAQS. Therefore, with the implementation of Mitigation Measure AQ-1 and AQ-2, $NO_X$, $PM_{10}$ and $PM_{2.5}$ emissions would be reduced to less than significant levels. The green hydrogen facility has since been removed from the Project, reducing overall emissions. Even with the removal of the hydrogen facility, significance findings would not change.

## Table 15 Mitigated Annual Construction Emissions

| Phase | | ROG | $NO_X$ | CO | $SO_X$ | $PM_{10}$ | $PM_{2.5}$ |
|---|---|---|---|---|---|---|---|
| | | Emissions (tons per year by phase) | | | | | |
| **36-Month Construction Scenario** | | | | | | | |
| 2025 | Total 2025 | 0.02 | 0.05 | 0.30 | 0.02 | 0.04 | 0.03 |
| 2026 | Total 2026 | 2.77 | 31.34 | 119.25 | 0.24 | 7.85 | 3.74 |
| 2027 | Total 2027 | 3.54 | 43.30 | 145.65 | 0.28 | 6.52 | 2.83 |
| 2028 | Total 2028 | 4.21 | 52.19 | 150.67 | 0.99 | 9.36 | 4.68 |
| **Maximum Annual** | | **4.21** | **52.19** | **150.67** | **0.99** | **9.36** | **4.68** |
| 2025 VERA Offset | | - | (0.00) | - | - | - | - |
| 2026 VERA Offset | | - | (21.39) | - | - | - | - |
| 2027 VERA Offset | | - | (33.35 | - | - | - | - |
| 2028 VERA Offset | | - | (42.24) | - | - | - | - |
| Total VERA Offsets (total Tons) | | | (96.98) | | | | |
| Maximum Annual With Mitigation[1] (VERA annually) | | | 9.95 | | | | |
| Threshold | | 10 | 10 | 100 | 27 | 15 | 15 |
| Exceed Threshold? | | No | No | **Yes[2]** | No | No | No |
| **18-Month Construction Scenario** | | | | | | | |
| 2025 | Total 2025 | 0.03 | 0.17 | 0.42 | 0.01 | 0.07 | 0.04 |
| 2026 | Total 2026 | 7.78 | 87.60 | 251.20 | 1.31 | 17.70 | 9.22 |
| 2027 | Total 2027 | 3.31 | 40.80 | 145.74 | 0.31 | 8.84 | 4.11 |
| **Maximum Annual** | | 7.78 | **87.60** | **251.20** | 1.31 | **17.70** | 9.22 |
| 2025 VERA Offset | | - | (0.00) | - | - | - | - |
| 2026 VERA Offset | | - | (21.39) | - | - | - | - |
| 2027 VERA Offset | | - | (33.35 | - | - | - | - |
| Total VERA Offsets (total Tons) | | | (108.50) | | | (1.75) | |
| Maximum Annual With VERA[1] (VERA annually) | | | 9.95 | | | 14.95 | |
| Threshold | | 10 | 10 | 100 | 27 | 15 | 15 |
| Exceed Threshold? | | No | No | **Yes[2]** | No | No | No |

$NO_X$= Nitrous Oxides; ROG = Reactive Organic Gases; $PM_{10}$ = Particulate matter with a diameter of 10 microns or less; $PM_{1.5}$ = Particulate Matter with a diameter of 2.5 microns or less

Notes: Rounded values shown; columns may not total exactly. See Appendix N-2 for calculations.

The mitigated emissions estimates shown in this table are for illustrative purposes. Depending on the ultimate availability of electric construction equipment, as allowed for by Mitigation Measure AQ-1, the final VERA offset amounts may differ from those shown in this table.

[1] VERA offsets would be required for the total project not just the maximum year.

[2] CO exceedances of thresholds are analyzed as part of an Ambient Air Quality Analysis discussed above, and as shown in Table 11 unmitigated CO emissions would not exceed ambient air quality standards

**Table 16 Maximum Mitigated Daily Construction Emissions**

| | Emissions (lbs/day) by year | | | | | |
|---|---|---|---|---|---|---|
| | ROG | $NO_X$ | CO | $SO_X$ | $PM_{10}$[1] | $PM_{2.5}$[1] |
| **36-Month Construction Schedule** | | | | | | |
| 2025 | 9 | 76 | **427** | 1 | 51 | 26 |
| 2026 | 37 | **379** | **1,570** | 3 | 98 | 48 |
| 2027 | 30 | **364** | **1,244** | 2 | 48 | 22 |
| 2028 | 49 | **574** | **2,139** | 4 | 89 | 41 |
| Maximum Daily | 49 | **574** | **2,139** | 4 | 89 | 41 |
| Screening Level | 100 | 100 | 100 | 100 | 100 | 100 |
| Exceeds Screening Level? | No | **No** | **Yes**[2] | No | No | No |
| **18-Month Construction Schedule** | | | | | | |
| 2025 | 38 | **389** | **637** | 1 | **117** | 64 |
| 2026 | 79 | **857** | **3,175** | 5 | **201** | **104** |
| 2027 | 60 | **708** | **2,817** | 5 | **145** | 68 |
| Maximum Daily | 79 | **857** | **3,175** | 5 | **201** | **104** |
| Max with MM AQ-1 (VERA) | | 77 | | | **115** | |
| Max with MM AQ-2 | | | | | **90** | **82** |
| Screening Level | 100 | 100 | 100 | 100 | 100 | 100 |
| Exceeds Screening Level? | No | **No** | **Yes**[2] | No | **No** | **No** |

Lbs/day = pounds per day; $NO_X$= Nitrous Oxides; ROG = Reactive Organic Gases; $PM_{10}$ = Particulate matter with a diameter of 10 microns or less; $PM_{1.5}$ = Particulate Matter with a diameter of 2.5 microns or less

[1]Includes compliance with Rule 8021 dust control measures, which accounts for watering.

[2]CO exceedances of thresholds are analyzed as part of an Ambient Air Quality Analysis discussed above, and as shown in Table 14 unmitigated CO emissions would not exceed ambient air quality standards

Similar to construction activities, decommissioning impacts would be reduced to a less than significant level with the incorporation of Mitigation Measures AQ-1 and AQ-2. Therefore, the proposed decommissioning activities, similar to construction activities, would result in less than significant impacts with implementation of Mitigation Measures AQ-1 and AQ-2.

| **Threshold 3:** | Would the Project expose sensitive receptors to substantial pollutant concentrations? |
|---|---|

**Impact AQ-3** CONSTRUCTION AND OPERATION OF THE PROJECT WOULD NOT RESULT IN EMISSIONS OF TACS SUFFICIENT TO EXCEED APPLICABLE HEALTH RISK CRITERIA. THE PROJECT WOULD NOT INCREASE CARBON MONOXIDE CONCENTRATIONS SUCH THAT IT WOULD CREATE CARBON MONOXIDE HOTSPOTS. HOWEVER, THE PROJECT MAY EXPOSE WORKERS AND NEARBY RECEPTORS TO VALLEY FEVER WITHOUT MITIGATION. IMPACTS WOULD BE LESS THAN SIGNIFICANT WITH IMPLEMENTATION OF MITIGATION.

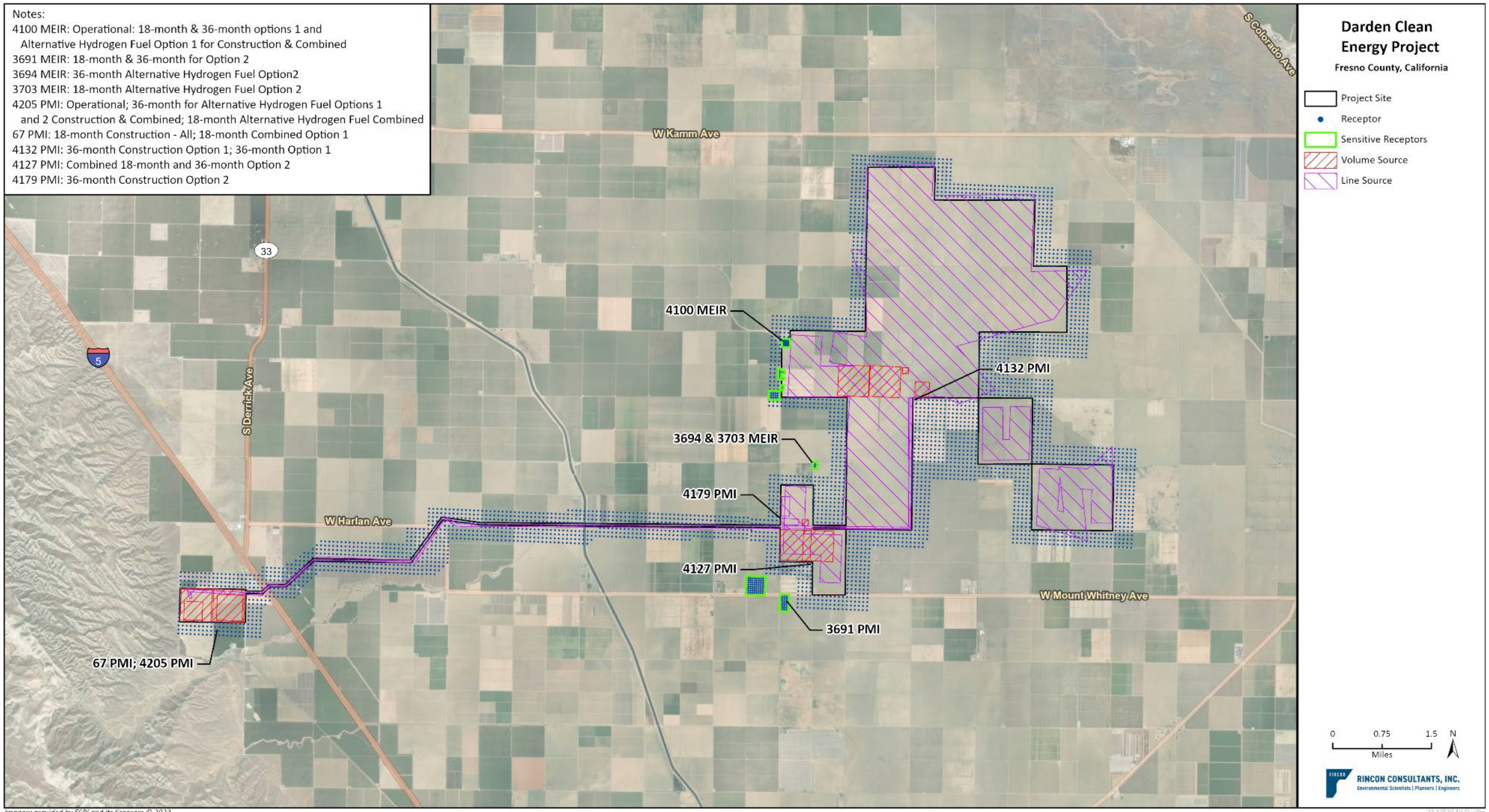
## Toxic Air Containments

### *Construction Health Risk Assessment*

As described in Section 1.3, *Project Description*, Project components would be constructed over a period of 18 to 36 months. Construction of the Project would require use of heavy-duty construction equipment and diesel trucks which would emit DPM. Figure 4 shows the receptor grids used to model health risk, the receptor grid off-site PMI, and the maximum exposed individual resident (MEIR).

The carcinogenic and chronic health risks at the MEIR and non-sensitive receptor PMI from construction and cumulative (construction, decommissioning and operational) risks are contained in Table 17 (refer to Appendix N-6 for detailed health risk calculations). The cancer risks shown in Table 17 represent the maximum risk at the location of an individual receptor or modeling point at a specific age. It is assumed in the HRA that the MEIR would be exposed to construction exhaust emissions while they are a third trimester fetus and a two-year-old child. Decommissioning was conservatively assumed to equal the risk of construction activities. Note that the chronic risk hazard quotient is a unitless value that represents non-carcinogenic risk, and this value is based on the maximum annual concentration. The Project MEIR was determined to be at a single-family residential property east of South Sonoma Avenue south of Elkhorn Avenue or the single-family residential properties at the southwest corner of South Sonoma Avenue and Mount Whitney Avenue depending on the construction option chosen (as shown in Figure 4). As shown in Table 17, excess cancer risk and chronic risk associated with Project construction would be up to 0.20 per million at the MEIR and up to 2.0 per million at the PMI, which would not exceed the significance threshold of 20 per million. Chronic risk would not exceed the threshold of 1.0 hazard index. It is conservatively assumed that decommissioning would be similar to construction risk. Construction and decommissioning risk would not exceed the significance thresholds at the PMI or the MEIR even if construction occurred at all parcels simultaneously. Impacts would be less than significant. The green hydrogen facility has since been removed from the Project, reducing overall emissions. As impacts related to this threshold are already less than significant, removal of this Project component does not change the significance findings.

**Figure 4 Sources, Sensitive Receptors, and PMI and MEIR Locations and Results**



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## Table 17 Health Risks Associated with Diesel Particulate Emissions During Project Construction, Operation, and Decommissioning

| | Cancer Risk (per one million)[5] | | | | Chronic Risk | | | |
|---|---|---|---|---|---|---|---|---|
| **Construction Phase** | **Option 1** | ~~**Option 2**~~ | ~~**Alt Opt 1**~~ | ~~**Alt Opt 2**~~ | **Option 1** | ~~**Option 2**~~ | ~~**Alt Opt 1**~~ | ~~**Alt Opt 2**~~ |
| **36-Month Construction Schedule** | | | | | | | | |
| Phase 1 – Site Preparation | 0.0066 | ~~0.0066~~ | ~~0.0066~~ | ~~0.0066~~ | 2.6E-05 | ~~2.6E-05~~ | ~~2.6E-05~~ | ~~2.6E-05~~ |
| Phase 2 – PV Panel System | 0.0572 | ~~0.0572~~ | ~~0.0572~~ | ~~0.0572~~ | 1.1E-04 | ~~1.1E-04~~ | ~~1.1E-04~~ | ~~1.1E-04~~ |
| Phase 3 – Inverters, Transformers, and Electrical Collection System | 0.0155 | ~~0.0248~~ | ~~0.0155~~ | ~~0.0248~~ | 2.2E-03 | ~~1.8E-03~~ | ~~2.2E-03~~ | ~~1.8E-03~~ |
| Phase 4 – Gen-Tie | 0.0010 | ~~0.0010~~ | ~~0.0010~~ | ~~0.0010~~ | 1.4E-05 | ~~1.4E-05~~ | ~~1.4E-05~~ | ~~1.4E-05~~ |
| Phase 5 – BESS | 0.0016 | ~~0.0037~~ | ~~0.0016~~ | ~~0.0037~~ | 4.4E-04 | ~~2.2E-04~~ | ~~4.4E-04~~ | ~~1.4E-05~~ |
| ~~Phase 6 – Green Hydrogen Facility~~ | ~~0.0482~~ | ~~0.0556~~ | ~~0.0024~~ | ~~0.0024~~ | ~~7.9E-04~~ | ~~1.7E-03~~ | ~~2.9E-03~~ | ~~2.9E-03~~ |
| Phase 7 – Switchyard | 0.0009 | ~~0.0009~~ | ~~0.0009~~ | ~~0.0009~~ | 2.0E-03 | ~~2.0E-03~~ | ~~2.0E-03~~ | ~~2.0E-03~~ |
| Total MEIR[1] | 0.1253 | ~~0.1253~~ | ~~0.0810~~ | ~~0.0823~~ | 1.8E-04 | ~~2.0E-04~~ | ~~9.0E-05~~ | ~~9.7E-05~~ |
| Combined MEIR[2] | 0.4331 | ~~0.4289~~ | ~~0.3443~~ | ~~0.3224~~ | NA | ~~NA~~ | ~~NA~~ | ~~NA~~ |
| PMI[3] | 1.6948 | ~~1.3395~~ | ~~1.4741~~ | ~~1.4742~~ | 3.0E-03 | ~~4.2E+03~~ | ~~3.0E-03~~ | ~~3.0E-03~~ |
| Combined PMI[4] | 4.0395 | ~~3.6115~~ | ~~5.7621~~ | ~~5.7623~~ | NA | ~~NA~~ | ~~NA~~ | ~~NA~~ |
| Threshold | 20 | ~~20~~ | ~~20~~ | ~~20~~ | 1 | ~~1~~ | ~~1~~ | ~~1~~ |
| Exceed Threshold | No | ~~No~~ | ~~No~~ | ~~No~~ | No | ~~No~~ | ~~No~~ | ~~No~~ |
| **18 – Month Construction Schedule** | | | | | | | | |
| Phase 1 – Site Prep | 0.0744 | ~~0.0744~~ | ~~0.0745~~ | ~~0.0745~~ | 1.3E-04 | ~~1.3E-04~~ | ~~1.3E-04~~ | ~~1.3E-04~~ |
| Phase 2 – PV Panel System | 0.0659 | ~~0.0659~~ | ~~0.0659~~ | ~~0.0659~~ | 5.4E-05 | ~~5.4E-05~~ | ~~5.4E-05~~ | ~~5.4E-05~~ |
| Phase 3 – Inverters, Transformers, and Electrical Collection System | 0.0133 | ~~0.0213~~ | ~~0.0133~~ | ~~0.0213~~ | 2.7E-05 | ~~1.8E-06~~ | ~~2.7E-05~~ | ~~1.8E-06~~ |
| Phase 4 – Gen-Tie | 0.0019 | ~~0.0019~~ | ~~0.0019~~ | ~~0.0019~~ | 1.8E-06 | ~~1.8E-06~~ | ~~1.8E-06~~ | ~~1.8E-06~~ |
| Phase 5 – BESS | 0.0035 | ~~0.0078~~ | ~~0.0035~~ | ~~0.0078~~ | 7.0E-06 | ~~1.6E-05~~ | ~~7.0E-06~~ | ~~1.6E-05~~ |
| ~~Phase 6 – Green Hydrogen Facility~~ | ~~0.0526~~ | ~~0.0607~~ | ~~0.0026~~ | ~~0.0026~~ | ~~8.0E-05~~ | ~~9.2E-05~~ | ~~4.0E-06~~ | ~~4.0E-06~~ |
| Phase 7 – Switchyard | 0.0017 | ~~0.0017~~ | ~~0.0017~~ | ~~0.0017~~ | 2.6E-06 | ~~2.6E-06~~ | ~~2.6E-06~~ | ~~2.6E-06~~ |
| Total MEIR[1] | 0.2045 | ~~0.1831~~ | ~~0.1562~~ | ~~0.1542~~ | 2.9E-04 | ~~2.3E-04~~ | ~~2.2E-04~~ | ~~1.9E-04~~ |

| Construction Phase | Cancer Risk (per one million)[5] | | | | Chronic Risk | | | |
|---|---|---|---|---|---|---|---|---|
| | Option 1 | ~~Option 2~~ | ~~Alt Opt 1~~ | ~~Alt Opt 2~~ | Option 1 | ~~Option 2~~ | ~~Alt Opt 1~~ | ~~Alt Opt 2~~ |
| Combined MEIR[2] | 0.6402 | ~~0.5921~~ | ~~0.5435~~ | ~~0.5205~~ | NA | ~~NA~~ | ~~NA~~ | ~~NA~~ |
| PMI[3] | 1.9285 | ~~1.9287~~ | ~~2.0458~~ | ~~2.0459~~ | 3.2E-03 | ~~2.9E-03~~ | ~~3.1E-03~~ | ~~3.1E-03~~ |
| Combined PMI[4] | 4.2479 | ~~4.2691~~ | ~~7.0812~~ | ~~7.0814~~ | NA | ~~NA~~ | ~~NA~~ | ~~NA~~ |
| Threshold | 20 | ~~20~~ | ~~20~~ | ~~20~~ | 1 | ~~1~~ | ~~1~~ | ~~1~~ |
| Exceed Threshold | No | ~~No~~ | ~~No~~ | ~~No~~ | No | ~~No~~ | ~~No~~ | ~~No~~ |

[1] Total risk is the sum of the risk for each phase by receptor. Total risk will not equal the sum of the individual phases as the maximum for each individual phase was reported regardless of receptor location. Total represents maximum residential receptor (MEIR)

[2] Combined MEIR is the maximum risk for a residential receptor, including construction, operational, and decommissioning (assumed as equal to construction as a conservative estimate) risk.

[3] PMI is the maximum non-sensitive receptor off-site risk.

[4] Combined PMI is the maximum risk for all receptors (residential and non-sensitive receptor), including construction, operational and decommissioning (assumed as equal to construction as a conservative estimate) risk.

[5] Cancer risk is presented for the following scenarios:

Option 1: Construction scenario that includes all Option 1 site components for step-up substation, BESS, and green hydrogen facility. Removal of the green hydrogen facility from the Project does not change the conclusions.

Option 2: Construction scenario that includes all Option 2 site components for step-up substation, BESS, and green hydrogen facility. This option has subsequently been removed from the Project.

Alt Opt 1: Construction Scenario that includes that includes Option 1 site components for step-up substation and BESS, and alternate site for green hydrogen facility. This option has subsequently been removed from the Project.

Alt Opt 2: Construction Scenario that includes that includes Option 2 site components for step-up substation and BESS, and alternate site for green hydrogen facility. This option has subsequently been removed from the Project.

Modeling results are included in Appendix N-6.

### *Operation*

As previously discussed, health impacts due to DPM are largely related to construction equipment exhaust. Operational activities throughout the Project site would use some diesel-fueled off-road equipment. Operational activities would, therefore, result in potential health risk impacts. Operational activities were modeled for a 30-year exposure consistent with procedures described in Methodology. Both 27.5- and 28.5-year operational exposures were modeled to add to the 36-month and 18-month construction schedules to determine the combined construction and operational risk as shown in Table 17 Increased cancer risk is 0.37 per million at the MEIR and 5.69 per million at the PMI for operational activities. Non-cancer risk is 0.0001 for the MEIR and 0.002 for the PMI location. Operational risk impacts would be less than significant. Combined risk for the Project is the combination of the health risk from construction, decommissioning, and operational activities at receptor locations. As shown in Table 17, the combined cancer risk is up to 0.64 per million at the MEIR and 7.08 per million at the PMI, which would not exceed the significance threshold of 20 per million. Chronic risk is annually assessed and, therefore, maximum chronic risk is equal to the individual chronic risks for construction, operation, and decommissioning. The green hydrogen facility has since been removed from the Project, reducing overall emissions. As impacts related to this threshold are already less than significant, removal of this Project component does not change the significance findings.

## CO Hotspots

A CO hotspot is a localized concentration of CO that is above a CO ambient air quality standard. Localized CO hotspots can occur at intersections with heavy peak hour traffic. Specifically, hotspots can be created at intersections where traffic levels are sufficiently high such that the local CO concentration exceeds the federal one-hour standard of 35.0 parts per million (ppm) or the federal and state eight-hour standard of 9.0 ppm (SJVAPCD 2022a).

The entire SJVAB is in conformance with state and federal carbon monoxide standards and no air quality monitoring stations report carbon monoxide levels in the SJVAPCD jurisdiction. Additionally, CARB no longer reports carbon monoxide concentrations anywhere in California. Based on the low background level of carbon monoxide in the SJVAB (indicated by the lack of monitoring at state or local levels), the low and the ever-improving emissions standards for new sources in accordance with state and federal regulations, and the fact that the project would result in a maximum of 60 trips per day as estimated by the Applicant during operational and maintenance activities. The Project would not cause the LOS on affected roadways to be reduced to LOS E or F and would not substantially worsen an existing LOS F roadway. Therefore, the project would not create new carbon monoxide hotspots. Additionally, as demonstrated under Impact AQ-2, CO emissions during construction and operation for the overall project, including mobile sources, would not exceed ambient air quality standards. Therefore, the project would not expose sensitive receptors to substantial carbon monoxide concentrations, and localized air quality impacts related to carbon monoxide hot spots would be less than significant.

## Valley Fever

Construction activities that include ground disturbance can result in fugitive dust, which can cause fungus *Coccidioides* spores to become airborne if they are present in the soil. These spores can cause Valley Fever. Workers who disturb soil where fungal spores are found, whether by digging, operating earthmoving equipment, driving vehicles, or by working in dusty, wind-blown areas, are more likely to breathe in spores and become infected. It is not a contagious disease and secondary infections are rare. The eastern portion of the Project site is located in western Fresno County where the risk is higher compared to other parts of the County (Fresno County 2023). Construction activities associated with the Project would include ground-disturbing activities that could result in an increased potential for exposure of nearby residents and on-site workers to airborne spores, if they are present. Compliance with dust control measured required by SJVAPCD Rule 8021 (as detailed in Table 3) would minimize personnel and public exposure to Valley Fever and reduce the potential risk of nearby resident and on-site worker exposure to Valley Fever. However, without additional controls, impacts resulting from the Project would still be potentially significant. Mitigation Measures AQ-2 and AQ-3 are provided to ensure that personnel and public exposure to Valley Fever is minimized to the greatest extent feasible. Therefore, impacts would be less than significant with implementation of Mitigation Measures AQ-2 and AQ-3.

## Mitigation

### *AQ-3 Minimize Personnel and Public Exposure to Valley Fever*

Prior to site preparation, grading activities, or ground disturbance, the Applicant shall prepare a Fugitive Dust Control Plan for the Project. The Fugitive Dust Control Plan shall include the following at a minimum:

- Equipment, vehicles, and other items shall be cleaned thoroughly of dust before they are moved off-site to other work locations.
- Wherever possible, grading, and trenching work shall be phased so that earth-moving equipment works well ahead or down-wind of workers on the ground.
- The area immediately behind grading or trenching equipment shall be sprayed with water before ground workers move into the area.
- If a water truck runs out of water before dust is dampened sufficiently, ground workers exposed to dust are to leave the area until a full truck resumes water spraying.
- All heavy-duty earth-moving vehicles shall be closed-cab and equipped with a High Efficiency Particulate Arrestance (HEPA) filtered air system.
- N95 respirators shall be provided to onsite workers for the duration of the construction period.
- Workers shall receive training to recognize the symptoms of Valley Fever and shall be instructed to promptly report suspected symptoms of work-related Valley Fever to a supervisor. Evidence of training shall be provided to the Fresno County Planning and Community Development Department within 24 hours of the training session.
- A Valley Fever informational handout shall be provided to all on-site construction personnel. The handout shall provide, at a minimum, information regarding the symptoms, health effects, preventative measures, and treatment.

## Significance After Mitigation.

Mitigation Measure AQ-3 would ensure that personnel and public exposure to Valley Fever is minimized to the greatest extent possible. Mitigation Measure AQ-2 would provide additional reduction in fugitive dust generation. Therefore, impacts would be less than significant with implementation of Mitigation Measures AQ-2 and AQ-3.

| **Threshold 4:** | Would the Project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people? |
|---|---|

**Impact AQ-4** **THE PROJECT WOULD NOT GENERATE ODORS ADVERSELY AFFECTING A SUBSTANTIAL NUMBER OF PEOPLE DURING CONSTRUCTION OR OPERATION. IMPACTS WOULD BE LESS THAN SIGNIFICANT.**

Substantial objectionable odors are normally associated with agriculture, wastewater treatment, industrial uses, or landfills. The Project would involve the construction, operation and maintenance, and decommissioning of a solar energy facility and associated infrastructure that do not produce objectionable odors. During construction activities, only short-term, temporary odors from vehicle exhaust and construction equipment engines would occur. Construction-related odors would disperse and dissipate and would not cause substantial odors at the closest sensitive receptors (adjacent residences). In addition, construction-related odors would be short-term and would cease upon completion of construction. Operation of the Project would also emit construction-related odors based on the equipment used to facilitate the activities. Impacts would be less than significant. The green hydrogen facility has since been removed from the Project, reducing overall emissions.

## 4.2 Cumulative Air Quality Impacts

The geographic scope for the cumulative air quality impact analysis is the SJVAB. Because the SJVAB is designated as non-attainment for the ozone, $PM_{10}$, and $PM_{2.5}$ NAAQS and CAAQS, there is an existing adverse cumulative effect in the SJVAB relative to these pollutants. The green hydrogen facility has since been removed from the Project, reducing overall emissions; however, removal of this Project component does not change the significance findings documented throughout this document.

Based on SJVAPCD thresholds in the GAMAQI, a project would have a significant cumulative impact if it is inconsistent with the applicable adopted federal and state air quality plans. As discussed under Impacts AQ-1 and Impact AQ-2, the Project would exceed SJVAPCD thresholds for $NO_X$, CO, and PM. CO, while exceeding regional thresholds, was modeled per the SJVAPCD AAQA methodology and compared to ambient air quality standards, as discussed in Impact AQ-2. CO concentrations would not exceed the ambient air quality standards and, therefore, CO impacts would be less than significant. With implementation of Mitigation Measures AQ-1 and AQ-2 emissions of $NO_X$ and PM would be reduced to below significance thresholds. Therefore, as discussed above under Impact AQ-1, the Project would not conflict with or obstruct implementation of the SJVAPCD's air quality plan with mitigation, and the Project's contribution to cumulative air quality impacts would be less than significant with mitigation.

The SJVAPCD considers TAC emissions to be a localized issue. In general, TAC concentrations are typically highest near the emissions sources and decline with increased distance. CARB recommends distances that should be incorporated when siting new sources or sensitive receptors near a source of TACs. This generally ranges from 500 to 1,000 feet depending on the source category (CARB 2005). Therefore, in the absence of any specific guidance from the SJVAPCD, the potential cumulative impacts from TACs were analyzed based on a radius of 1,000 feet measured from the Project site boundary. The Project is not located within 1,000 feet of any existing or planned projects that would generate TACs affecting a substantial number of people. Therefore, cumulative health risk impacts would be less than significant, as demonstrated in Impact AQ-3.

As discussed under Impact AQ-3, construction, operation, and decommissioning-related traffic is not anticipated to create a CO hotspot, as construction and decommissioning would be short-term and the nearest intersection is more than one mile from any sensitive receptor. Therefore, the Project's contribution to cumulative impacts related to CO hotspots would be less than significant.

## 4.3 Project-Level Greenhouse Gas Impacts

| | |
|---|---|
| **Threshold 1:** | Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? |
| **Threshold 2:** | Would the project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases? |

**Impact GHG-1 CONSTRUCTION, OPERATION, AND DECOMMISSIONING OF THE PROJECTS WOULD DIRECTLY AND INDIRECTLY GENERATE GHG EMISSIONS. CONSTRUCTION, OPERATION, AND DECOMMISSIONING OF THE PROJECTS WOULD BE CONSISTENT WITH APPLICABLE PLANS, POLICIES, AND REGULATIONS ADOPTED FOR THE PURPOSE OF REDUCING GHG EMISSIONS. IMPACTS WOULD BE LESS THAN SIGNIFICANT.**

### Emissions Quantifications

*Construction and Decommissioning Emissions*

Project-related construction and decommissioning emissions are confined to a relatively short period in relation to the overall life of the Project. Construction-related and decommissioning-related GHG emissions were quantified for informational purposes. Table 18 shows that Project construction would result in a total of approximately 75,498 MT $CO_2e$ for the 36-Month construction period and 62,440 MT $CO_2e$ for the 18-Month construction period. Decommissioning is conservatively assumed to be equal to construction emissions. However, this assumption is conservative as it is assumed additional carbon neutral technologies for construction equipment used in decommissioning will be implemented within the project lifespan. Emissions were then amortized over the lifetime of the Project (i.e., 35 years). As shown in Table 18, amortized construction emissions would be 2,157 MT $CO_2e$ per year for the 36-Month construction period and 1,784 MT $CO_2e$ per year for the 18-Month construction period. Amortized decommissioning emissions would be consistent with the amortized construction emissions.

**Table 18 Estimated Construction GHG Emissions**

| | Project Emissions (MT $CO_2e$) | |
|---|---|---|
| **Construction Phase** | **36-Month Schedule** | **18-Month Schedule** |
| **Solar Facility, Substation and Gen-Tie** | | |
| Phase 1: Site Prep | 5,459 | 5,251 |
| Phase 2: PV Panel | 45,270 | 30,716 |
| Phase 3: Inverters etc. | 11,074 | 11,069 |
| Phase 4: Gen-Tie | 3,081 | 3,536 |
| **Subtotal** | **64,884** | **50,572** |
| BESS Facility (Phase 5) | 3,987 | 5,203 |
| ~~Green Hydrogen Facility (Phase 6)~~ | 0 | 0 |
| Utility Switchyard (Phase 7) | 6,627 | 6,665 |
| Overall Project | 75,498 | 62,440 |

| Construction Phase | Project Emissions (MT $CO_2e$) 36-Month Schedule | 18-Month Schedule |
|---|---|---|
| **Amortized (35 years)** | **2,157** | **1,784** |

NA = Not applicable. Phases may or may not be active during a given year based on the provided construction schedule.
MT = metric tons
$CO_2e$ = carbon dioxide equivalents
Source: Appendix N-2.

### *Operational Emissions*

The Project would generate GHG emissions during operation from minimal area source, energy consumption and mobile emissions.[7] Operation-related GHG emissions were quantified for informational purposes and are shown in Table 19. As shown in Table 19, the Project would generate approximately 20,625 MT of $CO_2e$ per year from operation of the solar facility, gen-tie, utility switchyard, step-up substation and BESS. With the inclusion of amortized construction and decommissioning emissions, the Project would result in approximately 24,939 MT of $CO_2e$ per year with a 36-Month construction and decommissioning schedule and 24,193 MT of $CO_2e$ per year with an 18-Month construction and decommissioning schedule.

Although the Project would emit a total between 24,193 MT $CO_2e$ and 24,939 MT $CO_2e$ per year, the Project could offset GHG emissions by replacing fossil-fueled power plants and fossil-fuel powered vehicle use. Based on the Project's anticipated annual electricity generation and the GHG emissions generated due to fossil-fuel combustion to generate the same level of electricity only, the Project has the potential to displace 457,643 MT $CO_2e$ per year; conservatively. The net generation of annual GHG emissions would be between --432,704 MT $CO_2e$, and -433,451 MT $CO_2e$ in the first year as shown in Table 19.[8] As the amount of renewable energy in California increases towards 100 percent, the annual offset of the project will decrease to 0, leaving the project at a status of net zero for GHG emissions. As such, the project would be consistent with state GHG reduction plans such as SB 32. Further, the Project could result in an overall lifetime reduction of between 4,113,714 MT $CO_2e$ and 16,017,506 MT $CO_2e$ and would therefore be regionally beneficial.[9]

[7] Area sources for this project refer to consumer products (such as aerosol cleaners), and architectural coating (maintenance re-coating activities for battery storage).
[8] 24,939 MT $CO_2e$ -457,463 MT $CO_{2e}$ = -457,643 MT $CO_2e$; 24,193 MT $CO_{2e}$ – 457,643 MT $CO_2e$ = -433,451 MT $CO_2e$
[9] 457,643 MT $CO_2e$ * 35 years = 16,017,506 MT $CO_2e$ over the lifetime of the project assuming a static renewable percentage from 2023 over the 35 years. The 4,113,714 assumes a steady decrease in non-renewable resources across the board. Based on the 2023 power mix, approximately 7,248 MT CO2e is associated with each percentage of non-renewable energy included in the CA Power Mix. This value takes into account the type of non-renewable energy and the emissions per type. As it is unknown how the non-renewable energy systems will be removed from the CA Power Mix, the 7,248 MT CO2e per percentage was used to estimate the annual reduction in offset based on the increase in renewable energy per year needed to meet the 2045 goal of 100 percent renewable energy production within California.

### Table 19 Annual GHG Emissions

| Construction Phase | Project Emissions MT $CO_2e$ 36-Month Schedule | Project Emissions MT $CO_2e$ 18-Month Schedule |
|---|---|---|
| **Solar Facility, Step-Up Substation and BESS (Option 1), and Gen-Tie, and Utility Switchyard** | | |
| Road and Fence Repair | 30 | 30 |
| Road Reconditioning | 130 | 130 |
| Solar Panel Washing | 124 | 124 |
| Vegetation and Pest Management | 536 | 536 |
| O&M Facility | 47 | 47 |
| BESS - Battery Cooling | 17,415 | 17,415 |
| SF6 - Step-up Substation | 1,506 | 1,506 |
| SF6 - Utility Switchyard | 837 | 837 |
| **Subtotal** | 20,625 | 20,625 |
| **Construction and Decommissioning** | | |
| Amortized Construction | 2,157 | 1,784 |
| Amortized Decommissioning | 2,157 | 1,784 |
| **Combined Operational, Construction and Decommissioning with Option 1** | | |
| Solar Facility, Step-Up Substation and BESS (Option 1), and Gen-Tie, and Utility Switchyard | 20,625 | 20,625 |
| Construction & Decommissioning | 4,314 | 3,568 |
| **Total Operational, Construction, and Decommissioning** | **24,939** | **24,193** |
| **Annual Displaced Emissions** | **457,6439** | **457,643** |
| **Net Project Emissions** | **(432,704)** | **(433,451** |

Note: Parenthetical notation represents negative numbers.
$SF_6$ = Sulphur hexafluoride; MT = Metric Tons; $CO_2e$ = carbon dioxide equivalent
Source: Appendix N-2.

Approximately 11 percent of total operational emissions are associated with the emissions of $SF_6$, which is a component in the circuit breakers of the project. The Project would include up to 14 high voltage circuit breakers to support substation (9 circuit breakers) and utility Switchyard (5 circuit breakers) associated with the operation of Option 1 which would be implemented as the project is implemented. As detailed in the methodology section (Section 3.1), the use of $SF_6$ in electric utility systems and switchgear, including circuit breakers, poses a concern, because this pollutant has an extremely high global warming potential (one pound of $SF_6$ is the equivalent warming potential of approximately 24,600 pounds of $CO_2$). The circuit breakers used at the Project site would contain up to 1,500 pounds (lbs) of $SF_6$ each, for a total of 21,000 lbs of $SF_6$ gas. Assuming $SF_6$ leakage would not exceed 1 percent annually, total annual $SF_6$ leakage would be 210 lbs (0.10 MT). Based on the global warming potential of $SF_6$, the circuit breakers would result in 2,343 MT of $CO_2e$ emissions, annually.

In compliance with CARB regulations, the Applicant would be required to regularly inventory gas-insulated switchgear equipment, measure quantities of $SF_6$ and submit an annual report to CARB. In addition, the analysis assumed that all circuit breakers would contain $SF_6$ as a conservative analysis. As discussed in the regulatory section, CARB has implemented phasing requirements for the elimination of

$SF_6$ from electrical equipment, including circuit breakers. While the analysis assumes that all circuit breakers would contain $SF_6$, it is possible that circuit breakers in the later phases may not contain $SF_6$ and/or as circuit breakers are replaced they would be replaced with non-$SF_6$ technology. Additionally, as discussed in the methodology section, the analysis assumed the maximum amount of $SF_6$ per circuit breaker and depending on the circuit breaker actually used, $SF_6$ content may be substantially less than assumed in the analysis. Therefore, GHG emissions reported for the Project are conservative.

The Project would address the limitations of the electric grid and the increasing demand for renewable energy by increasing storage capability which improves the reliability of the grid and makes it more resilient to disturbances and peaks in energy demand. As the use of renewable energy increases, the need for battery storage to maintain electrical supply during both peak demand and when the renewable systems are not generating electricity also increases. It is anticipated that the reduction in GHG emissions from non-renewable electricity generating facilities would more than offset the annual GHG emissions anticipated from the Project, as more renewable energy facilities come online and non-renewable electricity generating facilities are taken offline. It is unknown how much growth in future demand would require the continuation of the use of the existing fossil fuel generation system even with the operation of energy storage systems. However, the project would eliminate the need to create new non-renewable energy generation sources to accommodate future energy demand. Therefore, the project is anticipated to result in a net benefit and overall reduction with respect to GHG emissions as shown in Table 19.

## Plan Consistency

### *2022 Scoping Plan*

The principal state GHG reduction plans and policies are AB 32, the California Global Warming Solutions Act of 2006, and the subsequent legislation, SB 32 and AB 1279. The goal of SB 32 is to reduce GHG emissions to 40 percent below 1990 levels by 2030. In 2022, the State passed AB 1279, which declares the State would achieve net-zero GHG emissions by 2045 and would reduce GHG emissions by 85 percent below 1990 levels by 2045. The latest iteration of the Scoping Plan is the 2022 Scoping Plan, which focuses on outcomes needed to achieve carbon neutrality by assessing paths for clean technology, energy deployment, natural and working lands, and others, and is designed to meet the state's long-term climate objectives and support a range of economic, environmental, energy security, environmental justice, and public health priorities. The 2022 Scoping Plan's strategies that apply to the proposed project include the following:

- Reducing fossil fuel use, energy demand and vehicle miles traveled (VMT);
- Building decarbonization; and
- Maximizing recycling and diversion from landfills

The proposed project would be consistent with these goals by reducing fossil fuel use by generating renewable energy, as well as through the implementation of the BESS facility that would store electrical energy for additional grid support during peak demand. In addition, the proposed building structures would not incorporate natural gas or propane, and the majority of the Project's electrical needs would be offset by the Project's operations. The Project's utility switchyard would be run by PG&E and would enhance the capacity of the transmission system and allow for the delivery of wholesale renewable electricity to the statewide grid. The Project would generate solar energy that would supplement PG&E's requirement to increase its renewable energy procurement in accordance with SB 100 targets. Therefore, the proposed project would not conflict with the 2022 Scoping Plan and GHG impacts would be less than significant.

## 4.4 Cumulative Greenhouse Gas Impacts

The geographic scope for related projects considered in the cumulative impact analysis for GHG emissions is global because impacts of climate change are experienced on a global scale regardless of the location of GHG emission sources. As discussed in Section 8.9.1 of the *GAMAQI*, GHG emissions and climate change are, by definition, cumulative impacts. Thus, the issue of climate change involves an analysis of whether a project’s contribution towards an impact is cumulatively considerable. As discussed under Impact GHG-1, Project impacts related to GHG emissions would be less than significant since the Project would be consistent with the state plans for reducing GHG emissions. Therefore, the Project’s contribution to cumulative GHG impacts would be less than significant.

# 5 References

California Air Pollution Control Officers Association. 2022. California Emissions Estimator Model User Guide: Version 2022.1. Prepared by ICF in collaboration with Sacramento Metropolitan Air Quality Management District, Fehr & Peers, STI, and Ramboll. April 2022. https://www.caleemod.com/documents/user-guide/CalEEMod_User_Guide_v2022.1.pdf (accessed January 2023).

California Air Resources Board (CARB). 2005. Air Quality and Land Use Handbook: A Community Health Perspective. http://www.aqmd.gov/docs/default-source/ceqa/handbook/california-air-resources-board-air-quality-and-land-use-handbook-a-community-health-perspective.pdf (accessed September 2023).

______. 2007. Resolution No. 07-103106. October 31, 2007.

______. 2008. Climate Change Scoping Plan. https://ww2.arb.ca.gov/sites/default/files/classic/cc/scopingplan/document/adopted_scoping_plan.pdf (accessed September 2023).

______. 2014. First Update to the Climate Change Scoping Plan. May. https://ww2.arb.ca.gov/sites/default/files/classic/cc/scopingplan/2013_update/first_update_climate_change_scoping_plan.pdf (accessed July 2021).

______. 2017. California's 2017 Climate Change Scoping Plan. December 14, 2017. https://www.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf (accessed July 2021).

______. 2018a. SB 375 Regional Plan Climate Targets. https://ww2.arb.ca.gov/our-work/programs/sustainable-communities-program/regional-plan-targets (accessed September 2023).

______. 2018b. 2020 Business-as-Usual (BAU) Emissions Projection – 2014 Edition. Last modified: June 22, 2018. www.arb.ca.gov/cc/inventory/data/bau.htm (accessed October 2018).

______. 2022a. Inhalable Particulate Matter and Health (PM2.5 and PM10). https://ww2.arb.ca.gov/resources/inhalable-particulate-matter-and-health (accessed September 2023).

______. 2022b. Overview: Diesel Exhaust & Health. https://ww2.arb.ca.gov/resources/overview-diesel-exhaust-and-health (accessed September 2023).

______. 2022c. 2022 Scoping Plan for Achieving Carbon Neutrality. November 16, 2022. https://ww2.arb.ca.gov/sites/default/files/2022-12/2022-sp_1.pdf (accessed September 2023).

______. 2023. iADAM: Air Quality Data Statistics Top 4 Summary. N.d. https://www.arb.ca.gov/adam/topfour/topfour1.php (accessed September 2023).

California Climate Change Center (CCCC). 2006. Climate Scenarios for California.

California Department of Public Health. 2021. Valley Fever Fact Sheet. Last Updated June 2021. https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/ValleyFeverFactSheet.pdf (accessed June 2023).

______. 2023. Coccidioidomycosis in California Provisional Monthly Report January-April 2023. April. https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/CocciinCAProvisionalMonthlyReport.pdf (accessed June 2023).

California Department of Water Resources. 2018. Indicators of Climate Change in California. May 2018. https://oehha.ca.gov/media/downloads/climate-change/report/2018caindicatorsreportmay2018.pdf (accessed August 2021).

California Department of Food and Agriculture. 2020. "California Agricultural Production Statistics." https://www.cdfa.ca.gov/statistics/ (accessed July 2021).

California Natural Resources Agency. 2009. 2009 California Climate Adaptation Strategy. March 2009. http://resources.ca.gov/docs/climate/Statewide_Adaptation_Strategy.pdf (accessed July 2021).

Fresno, County of. 2000. Fresno County General Plan Policy Document. October 3, 2000. https://www.fresnocountyca.gov/files/sharedassets/county/v/1/vision-files/files/18117-2000-general-plan-policy-document.pdf (accessed September 2023).

______. 2012. *County of Fresno Government Operations Greenhouse Gas Emissions Inventory, 2010 Baseline Year Narrative Report*. December 2012.

______. 2023. Public Health. https://www.fresnocountyca.gov/Departments/Public-Health (accessed September 2023).

Fresno Council of Governments (FCOG). 2018. Regional Transportation Plan Sustainable Communities Strategy 2018-2042. https://fresnocog.wpenginepowered.com/wp-content/uploads/2017/02/2018-RTP-Cover-Intro-table-of-contents-etc.Final-Draft.pdf (accessed September 2023).

Intergovernmental Panel on Climate Change (IPCC). 2018. Summary for Policymakers. In: Global warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty. https://www.ipcc.ch/sr15/ (accessed July 2021).

______. 2021a. Climate Change 2021 The Physical Science Basis. August. https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Full_Report.pdf (accessed August 2021).

______. 2021b. The Earth's Energy Budget, Climate Feedbacks and Climate Sensitivity Supplementary Material. https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Chapter07_SM.pdf (accessed September 2023).

______. 2023. Climate Change 2023 Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change, Core Writing Team, H. Lee and J. Romero (eds.), Geneva, Switzerland. https://www.ipcc.ch/report/ar6/syr/downloads/report/IPCC_AR6_SYR_FullVolume.pdf (accessed September 2023).

Kirkland and Fierey. 1996. Coccidioidomycosis: A Reemerging Infectious Disease. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2626789/ (accessed June 2023).

Los Angeles County Health Department. 2013. Preventing Work-Related Coccidioidomycosis (Valley Fever). June. http://publichealth.lacounty.gov/acd/docs/ValleyFeverPreventionforWorkFlyer.pdf (accessed June 2023).

National Oceanic and Atmospheric Administration. 2020. “Global Climate Report for Annual 2019.” State of the Climate. January 2020. https://www.ncdc.noaa.gov/sotc/global/201813 (accessed September 2023).

Office of Environmental Health Hazard Assessment (OEHHA). 2015. Air Toxics Hot Spots Program Risk Assessment Guidelines - The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments. February. https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf (accessed August 2021).

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2004. Rule 8021 Construction, Demolition, Excavation, Extraction, and Other Earthmoving Activities. Adopted November 15, 2001, Amended August 19, 2004. www.valleyair.org/rules/currntrules/r8021.pdf (accessed July 2021).

______. 2007a. 2007 Ozone Plan. Adopted June 14, 2007. http://www.valleyair.org/Air_Quality_Plans/docs/AQ_Ozone_2007_Adopted/2007_8HourOzone_CompletePlan.pdf (accessed July 2021).

______. 2007b. 2007 $PM_{10}$ Maintenance Plan and Request for Redesignation. September. http://www.valleyair.org/Air_Quality_Plans/docs/Maintenance%20Plan10-25-07.pdf (accessed July 2021).

______. 2008a. 2018 $PM_{2.5}$ Plan. April. http://www.valleyair.org/Air_Quality_Plans/AQ_Final_Adopted_PM25_2008.htm (accessed July 2021).

______.2008b. Climate Change Action Plan. https://www.valleyair.org/Programs/CCAP/CAPP%20Staff%20Report%202008Nov12.pdf (accessed November 2008).

______. 2009a. 2009 Reasonably Available Control Technology (RACT) Demonstration for Ozone State Implementation Plans (SIP). April 16, 2009. http://valleyair.org/Air_Quality_Plans/docs/RACTSIP-2009.pdf (accessed July 2021).

______. 2009b. Guidance for Valley Land-Use Agencies in Addressing GHG Emission Impacts for New Projects Under CEQA. December. http://www.valleyair.org/Programs/CCAP/12-17-09/3%20CCAP%20-%20FINAL%20LU%20Guidance%20-%20Dec%2017%202009.pdf (accessed July 2021).

______.2009c. Final Staff Report Addressing Greenhouse Gas Emissions Impacts Under the California Environmental Quality Act. December. https://www.valleyair.org/Programs/CCAP/12-17-09/1%20CCAP%20-%20FINAL%20CEQA%20GHG%20Staff%20Report%20-%20Dec%2017%202009.pdf (accessed July 2021).

______. Procedure for Determining NO2 Monitor Background Values (Design Values) for use in Calculating NAAQS Compliance. http://www.valleyair.org/busind/pto/tox_resources/airqualitymonitoring.htm#modeling_guidance (accessed September 2023).

______. 2012. 2012 $PM_{2.5}$ Plan. Adopted December 20, 2012. http://www.valleyair.org/Air_Quality_Plans/PM25Plan2012/CompletedPlanbookmarked.pdf (accessed July 2021).

______. 2013a. 2013 Plan for the Revoked 1-Hour Ozone Standard. September 19, 2013. http://valleyair.org/Air_Quality_Plans/OzoneOneHourPlan2013/AdoptedPlan.pdf (accessed July 2021).

______. 2013b. Rule 4702 Internal Combustion Engine. Adopted August 21, 2003, Amended November 14, 2013. https://www.valleyair.org/rules/currntrules/R4702_Clean.pdf (accessed August 2021).

______. 2014. 2014 Reasonably Available Control Technology (RACT) Demonstration for the 8-Hour Ozone State Implementation Plan (SIP). June 19, 2014. http://valleyair.org/Air_Quality_Plans/docs/2014-RACT-SIP.PDF (accessed July 2021).

______. 2015a. *Guide for Assessing and Mitigating Air Quality Impacts*, March 19, 2015. www.valleyair.org/transportation/GAMAQI_3-19-15.pdf (accessed July 2021).

______. 2015b. San Joaquin Valley Air Pollution Control District 2015 Annual Report, Indirect Source Review Program, Reporting Period: July 1, 2014 to June 30, 2015. December 17, 2015. www.valleyair.org/isr/Documents/2015-ISR-Annual-Report.pdf (accessed July 2021).

______. 2015c. 2015 Plan for the 1997 $PM_{2.5}$ Standard. Adopted April 2015. www.valleyair.org/Air_Quality_Plans/docs/PM25-2015/2015-PM2.5-Plan_Bookmarked.pdf (accessed July 2021).

______. 2015d. Update to District's Risk Management Policy to Address OEHHA's Revised Risk Assessment Guidance Document Final Staff Report. http://valleyair.org/busind/pto/staff-report-5-28-15.pdf (accessed September 2023).

______. 2016. 2016 Moderate Area Plan for the 2012 $PM_{2.5}$ Standard. Adopted September 15, 2016. www.valleyair.org/Air_Quality_Plans/docs/PM25-2016/2016-Plan.pdf (accessed July 2021).

______. 2017. Rule 9510 (Indirect Source Review). December 15, 2005. Amended December 21, 2017, but not in effect until March 21, 2018. www.valleyair.org/rules/currntrules/r9510.pdf (accessed July 2021).

______. 2018. 2018 Plan for the 1997, 2006, and 2012 $PM_{2.5}$ Standards. Adopted November 15, 2018. http://www.valleyair.org/pmplans/documents/2018/pm-plan-adopted/2018-Plan-for-the-1997-2006-and-2012-PM2.5-Standards.pdf (accessed July 2021).

______. 2019. PR 1924 Policy for District Rule 2201 AAQA Modeling. http://www.valleyair.org/policies_per/Policies/APR-1925.pdf (accessed September 2023).

______. 2020. 2020 Reasonably Available Control Technology (RACT) Demonstration for the 2015 8-Hour Ozone Standard. Adopted June 18, 2020. http://valleyair.org/Air_Quality_Plans/docs/2020-RACT-Demonstration.pdf (accessed July 2021).

______. 2022a. Ambient Air Quality Standards & Valley Attainment Status. https://www.valleyair.org/aqinfo/attainment.htm (accessed September 2023).

______. 2022b. 2022 Plan for the 2015 8-Hour Ozone Standard. December 15, 2022. https://ww2.valleyair.org/media/q55posm0/0000-2022-plan-for-the-2015-8-hour-ozone-standard.pdf (accessed September 2023).

______. 2022c. Guidance for Air Dispersion Modeling. September 2022. http://www.valleyair.org/busind/pto/tox_resources/Modeling_Guidance.pdf (accessed September 2023).

______. 2023. Proposed 2023 Maintenance Plan and Redesignation Request for the Revoked 1-Hour Ozone Standard. May 16, 2023. https://www.valleyair.org/Workshops/postings/2023/06-15-23/maintenance-plan.pdf (accessed September 2023).

Sierra Club v. EPA, 671 F.3d 955 *Sierra Club v. United States Environmental Protection Agency*, 671 F.3d 955 (9th Cir. 2012) https://www.courtlistener.com/opinion/621235/sierra-club-v-usepa/? (accessed September 2023).

United States Environmental Protection Agency (USEPA). 2008. Redesignation of the San Joaquin Valley SJVAB PM-10 Nonattainment Area to Attainment. Federal Register. November 12, 2008. www.federalregister.gov/documents/2008/11/12/E8-26500/approval-and-promulgation-of-implementation-plans-designation-of-areas-for-air-quality-planning (accessed September 2023).

____. 2013. Policy Assessment for the Review of the Lead National Ambient Air Quality Standards, External Review Draft. https://www3.epa.gov/ttn/naaqs/standards/pb/data/010913_pb-draft-pa.pdf (accessed July 2021).

_____. 2017. Revisions to the Guideline on Air Quality Models: Enhancements to the AERMOD Dispersion Modeling System and Incorporation of Approaches to Address Ozone and Fine Particulate Matter. January 2017. Vol. 82, No. 10. https://www.federalregister.gov/documents/2017/01/17/2016-31747/revisions-to-the-guideline-on-air-quality-models-enhancements-to-the-aermod-dispersion-modeling (accessed September 2023).

____. 2021a. "Criteria Air Pollutants." https://www.epa.gov/criteria-air-pollutants (accessed July 2021).

______. 2022. NAAQS Designations Process. https://www.epa.gov/criteria-air-pollutants/naaqs-designations-process#:~:text=If%20the%20air%20quality%20in%20a%20geographic%20area,meet%20the%20national%20standard%20are%20called%20nonattainment%20areas (accessed September 2023).

______. 2023a. "Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2019." Last updated: January 25, 2023. https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2019 (accessed September 2023).

______. 2023b. "Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act." Last updated: April 4, 2023. https://www.epa.gov/climate-change/endangerment-and-cause-or-contribute-findings-greenhouse-gases-under-section-202a (accessed September 2023).

# Appendix N-1

Assumptions

# Appendix N-2

Calculations

# Darden Renewable Energy Project
# Construction CalEEMod
# All Tier 4 Annual - 36 Month

**Ph1: Site Prep / Grading (2025) [Table 3.13]**

| | | TOG | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Category | tons/year | | | | | | | | | | |
| | Off-Road | 0.005 | 0.005 | 0.03 | 0.15 | 0.005 | 0.005 | | 0.005 | 0.005 | | 0.005 |
| | Dust | | | | | | | 0.02 | 0.02 | | 0.01 | 0.01 |
| | On-Site Truck | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Worker | 0.005 | 0.005 | 0.005 | 0.005 | 0 | 0 | 0.005 | 0.005 | 0 | 0.005 | 0.005 |
| | Vendor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 160 | Hauling 160 mi | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| | **Total** | **0.02** | **0.02** | **0.05** | **0.17** | **0.02** | **0.02** | **0.04** | **0.04** | **0.02** | **0.03** | **0.03** |
| 60 | Hauling 60 mi | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 |

**Ph1: Site Prep / Grading (2026) [3.15]**

| | TOG | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/year | | | | | | | | | | |
| Off-Road | 0.53 | 0.53 | 5.04 | 29.1 | 0.05 | 0.1 | | 0.1 | 0.1 | | 0.1 |
| Dust | | | | | | | 3.27 | 3.27 | | 1.65 | 1.65 |
| On-Site Truck | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Worker | 0.09 | 0.08 | 0.05 | 0.63 | 0 | 0 | 0.12 | 0.12 | 0 | 0.03 | 0.03 |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hauling 160 mi | 0.01 | 0.01 | 0.43 | 0.08 | 0.01 | 0.01 | 0.11 | 0.11 | 0.01 | 0.03 | 0.03 |
| **Total** | **0.633333333** | **0.623333333** | **5.516666667** | **29.81** | **0.063333333** | **0.113333333** | **3.496666667** | **3.596666667** | **0.113333333** | **1.706666667** | **1.806666667** |
| Hauling 60 mi | 0.005 | 0.005 | 0.16 | 0.03 | 0.005 | 0.005 | 0.04 | 0.04 | 0.005 | 0.01 | 0.01 |

# Darden Renewable Energy Project
# Construction CalEEMod
# All Tier 4 Annual - 36 Month

**Ph2: PV Panel System / 1st Site Prep (2026) [3.1]**

| Category | TOG | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | tons/year | | | | | | | | | | |
| Off-Road | 1.26 | 1.23 | 16 | 58.9 | 0.1 | 0.23 | | 0.23 | 0.23 | | 0.23 |
| Fugitive Dust | | | | | | | 1.64 | 1.64 | | 0.77 | 0.77 |
| On-site Truck | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Worker | 0.36 | 0.33 | 0.21 | 2.6 | 0 | 0 | 0.49 | 0.49 | 0 | 0.12 | 0.12 |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hauling 160 mi | 0.08 | 0.03 | 2.96 | 0.51 | 0.03 | 0.05 | 0.72 | 0.77 | 0.05 | 0.21 | 0.27 |
| **Total** | **1.7** | **1.586666667** | **19.17** | **62.00666667** | **0.126666667** | **0.283333333** | **2.85** | **3.133333333** | **0.283333333** | **1.103333333** | **1.386666667** |
| Hauling 60 mi | 0.03 | 0.01 | 1.11 | 0.19 | 0.01 | 0.02 | 0.27 | 0.29 | 0.02 | 0.08 | 0.1 |

**Ph2: PV Panel System / 1st Site Prep (2027) [3.3]**

| Category | TOG | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | tons/year | | | | | | | | | | |
| Off-Road | 2.14 | 2.08 | 27 | 100 | 0.16 | 0.4 | | 0.4 | 0.39 | | 0.39 |
| Fugitive Dust | | | | | | | 2.78 | 2.78 | | 1.31 | 1.31 |
| On-site Truck | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Worker | 0.54 | 0.53 | 0.32 | 4.07 | 0 | 0 | 0.84 | 0.84 | 0 | 0.2 | 0.2 |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hauling 160 mi | 0.13 | 0.05 | 4.88 | 0.83 | 0.03 | 0.08 | 1.25 | 1.33 | 0.08 | 0.35 | 0.43 |
| **Total** | **2.813333333** | **2.663333333** | **32.2** | **104.8966667** | **0.186666667** | **0.48** | **4.873333333** | **5.353333333** | **0.47** | **1.856666667** | **2.326666667** |
| Hauling 60 mi | 0.05 | 0.02 | 1.83 | 0.31 | 0.01 | 0.03 | 0.47 | 0.5 | 0.03 | 0.13 | 0.16 |

# Darden Renewable Energy Project
# Construction CalEEMod
# All Tier 4 Annual - 36 Month

**Ph2: PV Panel System / 1st Site Prep (2028) [3.5]**

| Category | TOG | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | tons/year | | | | | | | | | | |
| Off-Road | 0.71 | 0.69 | 8.95 | 33.2 | 0.05 | 0.13 | | 0.13 | 0.13 | | 0.13 |
| Fugitive Dust | | | | | | | 0.92 | 0.92 | | 0.44 | 0.44 |
| On-Site Truck | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Worker | 0.17 | 0.16 | 0.1 | 1.26 | 0 | 0 | 0.28 | 0.28 | 0 | 0.07 | 0.07 |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hauling 160 mi | 0.05 | 0.03 | 1.57 | 0.27 | 0.01 | 0.03 | 0.40 | 0.45 | 0.03 | 0.11 | 0.13 |
| **Total** | **0.933333333** | **0.876666667** | **10.62333333** | **34.72666667** | **0.063333333** | **0.156666667** | **1.6** | **1.783333333** | **0.156666667** | **0.616666667** | **0.773333333** |
| Hauling 60 mi | 0.02 | 0.01 | 0.59 | 0.1 | 0.005 | 0.01 | 0.15 | 0.17 | 0.01 | 0.04 | 0.05 |

Ph3: Inverters, etc / 1st Building Construction (2027) [3.17]

| Category | TOG | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | tons/year | | | | | | | | | | |
| Off-Road | 0.51 | 0.51 | 6.98 | 27.9 | 0.04 | 0.09 | | 0.09 | 0.09 | | 0.09 |
| On-Site Truck | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Worker | 0.13 | 0.13 | 0.08 | 1 | 0 | 0 | 0.21 | 0.21 | 0 | 0.05 | 0.05 |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hauling 160 mi | 0.05 | 0.03 | 1.79 | 0.29 | 0.01 | 0.03 | 0.45 | 0.48 | 0.03 | 0.13 | 0.16 |
| **Total** | **0.693333333** | **0.666666667** | **8.846666667** | **29.19333333** | **0.053333333** | **0.116666667** | **0.663333333** | **0.78** | **0.116666667** | **0.183333333** | **0.3** |
| Hauling 60 mi | 0.02 | 0.01 | 0.67 | 0.11 | 0.005 | 0.01 | 0.17 | 0.18 | 0.01 | 0.05 | 0.06 |

# Darden Renewable Energy Project
# Construction CalEEMod
# All Tier 4 Annual - 36 Month

**Ph3: Inverters, etc / 1st Building Construction (2028) [3.19]**

| | TOG | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/year | | | | | | | | | | |
| Off-Road | 0.28 | 0.28 | 3.88 | 15.5 | 0.02 | 0.05 | | 0.05 | 0.05 | | 0.05 |
| On-Site Truck | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Worker | 0.07 | 0.07 | 0.04 | 0.52 | 0 | 0 | 0.11 | 0.11 | 0 | 0.03 | 0.03 |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hauling 160 mi | 0.03 | 0.01 | 0.96 | 0.16 | 0.01 | 0.03 | 0.24 | 0.27 | 0.03 | 0.08 | 0.08 |
| **Total** | **0.376666667** | **0.363333333** | **4.88** | **16.18** | **0.033333333** | **0.076666667** | **0.35** | **0.426666667** | **0.076666667** | **0.11** | **0.16** |
| Hauling 60 mi | 0.01 | 0.005 | 0.36 | 0.06 | 0.005 | 0.01 | 0.09 | 0.1 | 0.01 | 0.03 | 0.03 |

**Ph4: Gen-tie / 2nd Building Construction (2027) [3.21]**

| | TOG | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lbs/day | | | | | | | | | | |
| Off-Road | 0.01 | 0.01 | 0.38 | 0.69 | 0.005 | 0.005 | | 0.005 | 0.005 | | 0.005 |
| On-Site Truck | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Worker | 0.01 | 0.01 | < 0.005 | 0.06 | 0 | 0 | 0.01 | 0.01 | 0 | 0.005 | 0.005 |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hauling 160 mi | 0.01 | 0.01 | 0.16 | 0.03 | 0.01 | 0.01 | 0.05 | 0.05 | 0.01 | 0.01 | 0.03 |
| **Total** | **0.033333333** | **0.033333333** | **0.54** | **0.776666667** | **0.018333333** | **0.018333333** | **0.063333333** | **0.068333333** | **0.018333333** | **0.018333333** | **0.036666667** |
| Hauling 60 mi | 0.005 | 0.005 | 0.06 | 0.01 | 0.005 | 0.005 | 0.02 | 0.02 | 0.005 | 0.005 | 0.01 |

# Darden Renewable Energy Project
# Construction CalEEMod
# All Tier 4 Annual - 36 Month

**Ph4: Gen-tie / 2nd Building Construction (2028) [3.23]**

| | TOG | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lbs/day | | | | | | | | | | |
| Off-Road | 0.06 | 0.06 | 1.62 | 2.95 | < 0.005 | 0.01 | | 0.01 | 0.01 | | 0.01 |
| On-Site Truck | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Worker | 0.03 | 0.03 | 0.02 | 0.24 | 0 | 0 | 0.05 | 0.05 | 0 | 0.01 | 0.01 |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hauling 160 mi | 0.03 | 0.01 | 0.67 | 0.11 | 0.01 | 0.01 | 0.19 | 0.19 | 0.01 | 0.05 | 0.05 |
| **Total** | **0.116666667** | **0.103333333** | **2.306666667** | **3.296666667** | **0.013333333** | **0.023333333** | **0.236666667** | **0.246666667** | **0.023333333** | **0.063333333** | **0.073333333** |
| Hauling 60 mi | 0.01 | 0.005 | 0.25 | 0.04 | 0.005 | 0.005 | 0.07 | 0.07 | 0.005 | 0.02 | 0.02 |

**Darden Renewable Energy Project**
**Construction CalEEMod**
**All Tier 4 Annual - 36 Month**

**Ph5: Battery Storage / 3rd Building Construction (2028) [3.25]**

| | TOG | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lbs/day | | | | | | | | | | |
| Off-Road | 0.13 | 0.13 | 2.78 | 5.96 | 0.01 | 0.02 | | 0.02 | 0.02 | | 0.02 |
| On-Site Truck | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Worker | 0.05 | 0.05 | 0.03 | 0.39 | 0 | 0 | 0.09 | 0.09 | 0 | 0.02 | 0.02 |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hauling 160 mi | 0.08 | 0.03 | 2.24 | 0.40 | 0.03 | 0.05 | 0.59 | 0.64 | 0.05 | 0.16 | 0.21 |
| **Total** | **0.26** | **0.206666667** | **5.05** | **6.75** | **0.036666667** | **0.073333333** | **0.676666667** | **0.75** | **0.073333333** | **0.18** | **0.253333333** |
| Hauling 60 mi | 0.03 | 0.01 | 0.84 | 0.15 | 0.01 | 0.02 | 0.22 | 0.24 | 0.02 | 0.06 | 0.08 |

| | TOG | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lbs/day | | | | | | | | | | |
| Off-Road | | | | | | | | | | | |
| On-Site Truck | | | | | | | | | | | |
| Worker | | | | | | | | | | | |
| Vendor | | | | | | | | | | | |
| Hauling | | | | | | | | | | | |
| **Total** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** |

# Darden Renewable Energy Project
# Construction CalEEMod
# All Tier 4 Annual - 36 Month

**Ph6: Hydrogen / 2nd Site Prep (2028) [3.7]**

| Category | TOG | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | lbs/day | | | | | | | | | | |
| Off-Road | 1.47 | 1.47 | 14.4 | 79.4 | 0.13 | 0.27 | | 0.27 | 0.27 | | 0.27 |
| Dust | | | | | | | 3.03 | 3.03 | | 1.49 | 1.49 |
| On-site Truck | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Worker | 0.1 | 0.09 | 0.06 | 0.73 | 0 | 0 | 0.16 | 0.16 | 0 | 0.04 | 0.04 |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hauling 160 mi | 0.16 | 0.05 | 5.60 | 0.99 | 0.03 | 0.11 | 1.47 | 1.57 | 0.11 | 0.40 | 0.51 |
| **Total** | **1.73** | **1.613333333** | **20.06** | **81.11666667** | **0.156666667** | **0.376666667** | **4.656666667** | **5.033333333** | **0.376666667** | **1.93** | **2.306666667** |
| Hauling 60 mi | 0.06 | 0.02 | 2.1 | 0.37 | 0.01 | 0.04 | 0.55 | 0.59 | 0.04 | 0.15 | 0.19 |

| Category | TOG | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | lbs/day | | | | | | | | | | |
| Off-Road | | | | | | | | | | | |
| Dust | | | | | | | | | | | |
| On-site Truck | | | | | | | | | | | |
| Worker | | | | | | | | | | | |
| Vendor | | | | | | | | | | | |
| Hauling | | | | | | | | | | | |
| **Total** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** |

# Darden Renewable Energy Project
## Construction CalEEMod
## All Tier 4 Annual - 36 Month

Ph7: Utility Switchyard / 3rd Site Prep (2026) [3.11]

| | TOG | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | | | | | | lbs/day | | | | | |
| Off-Road | 0.49 | 0.49 | 5.85 | 24.9 | 0.04 | 0.09 | | 0.09 | 0.09 | | 0.09 |
| Dust | | | | | | | 0.77 | 0.77 | | 0.38 | 0.38 |
| On-Site Truck | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Worker | 0.05 | 0.04 | 0.03 | 0.35 | 0 | 0 | 0.07 | 0.07 | 0 | 0.02 | 0.02 |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hauling 160 mi | 0.03 | 0.01 | 0.69 | 0.11 | 0.01 | 0.01 | 0.16 | 0.19 | 0.01 | 0.05 | 0.05 |
| **Total** | **0.566666667** | **0.543333333** | **6.573333333** | **25.35666667** | **0.053333333** | **0.103333333** | **1** | **1.116666667** | **0.103333333** | **0.453333333** | **0.543333333** |
| Hauling 60 mi | 0.01 | 0.005 | 0.26 | 0.04 | 0.005 | 0.005 | 0.06 | 0.07 | 0.005 | 0.02 | 0.02 |

Ph7: Utility Switchyard / 3rd Site Prep (2027) [3.13]

| | | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | | | | | | lbs/day | | | | | |
| Off-Road | 0.14 | 0.14 | 1.74 | 7.42 | 0.01 | 0.03 | | 0.03 | 0.03 | | 0.03 |
| Dust | | | | | | | 0.23 | 0.23 | | 0.11 | 0.11 |
| On-Site Truck | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Worker | 0.01 | 0.01 | 0.01 | 0.1 | 0 | 0 | 0.02 | 0.02 | 0 | 0.005 | 0.005 |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hauling 160 mi | 0.01 | 0.01 | 0.19 | 0.03 | 0.01 | 0.01 | 0.05 | 0.05 | 0.01 | 0.03 | 0.03 |
| **Total** | **0.163333333** | **0.163333333** | **1.936666667** | **7.546666667** | **0.023333333** | **0.043333333** | **0.303333333** | **0.333333333** | **0.043333333** | **0.141666667** | **0.171666667** |
| Hauling 60 mi | 0.005 | 0.005 | 0.07 | 0.01 | 0.005 | 0.005 | 0.02 | 0.02 | 0.005 | 0.01 | 0.01 |

**Darden Renewable Energy Project**
**Construction CalEEMod**
**All Tier 4 Annual - 36 Month**

Max Daily

| Category | TOG | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | lbs/day | | | | | | | | | | |
| Daily - Summer (Max) | | | | | | | | | | | |
| 2026 | 38.1 | 36.9 | 379 | 1570 | 2.63 | 5.94 | 92.5 | 98.4 | 5.88 | 42.3 | 48.2 |
| 2027 | 30.3 | 29.2 | 323 | 1187 | 1.97 | 4.58 | 36.4 | 41 | 4.52 | 13.9 | 18.4 |
| 2028 | 51.2 | 49 | 569 | 2139 | 3.75 | 8.34 | 80.3 | 88.6 | 8.29 | 32.4 | 40.6 |
| Daily - Winter (Max) | | | | | | | | | | | |
| 2025 | 9.03 | 8.89 | 75.6 | 427 | 0.71 | 1.46 | 49.2 | 50.7 | 1.46 | 24.3 | 25.8 |
| 2026 | 28.2 | 27.3 | 306 | 1133 | 1.92 | 4.48 | 49.2 | 50.7 | 4.42 | 24.3 | 25.8 |
| 2027 | 31.7 | 30.2 | 364 | 1244 | 2.09 | 4.85 | 43.2 | 47.7 | 4.79 | 18 | 22.4 |
| 2028 | 50.2 | 47.9 | 574 | 2126 | 3.75 | 8.34 | 80.3 | 88.6 | 8.29 | 32.4 | 40.6 |
| Max by Year | | | | | | | | | | | |
| 2025 | 9 | 9 | 76 | 427 | 1 | 1 | 49 | 51 | 1 | 24 | 26 |
| 2026 | 38 | 37 | 379 | 1570 | 3 | 6 | 93 | 98 | 6 | 42 | 48 |
| 2027 | 32 | 30 | 364 | 1244 | 2 | 5 | 43 | 48 | 5 | 18 | 22 |
| 2028 | 51 | 49 | 574 | 2139 | 4 | 8 | 80 | 89 | 8 | 32 | 41 |
| Screening Level | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Exceed? | No | No | Yes | Yes | No | No | No | No | No | No | No |

# Darden Renewable Energy Project
# Construction CalEEMod
# All Tier 4 Annual - 36 Month

**Ph1: Site Prep / Grading (2025) [Table 3.13]**

| | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | tons/year | | | | | | | | | |
| **CalEEMod** | **0.023333333** | **0.048333333** | **0.168333333** | **0.018333333** | **0.018333333** | **0.038333333** | **0.043333333** | **0.018333333** | **0.028333333** | **0.033333333** |
| **UTV** | **8.03E-06** | **5.13E-03** | **1.32E-01** | **2.45E-08** | | | **6.65E-08** | | | **1.94E-07** |
| **2025 TOTAL** | **0.023341358** | **0.053459081** | **0.299894188** | **0.018333358** | **0.018333333** | **0.038333333** | **0.0433334** | **0.018333333** | **0.028333333** | **0.033333528** |

**Ph1: Site Prep / Grading (2026) [3.15]**

| | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | tons/year | | | | | | | | | |
| **CalEEMod** | **0.623333333** | **5.516666667** | **29.81** | **0.063333333** | **0.113333333** | **3.496666667** | **3.596666667** | **0.113333333** | **1.706666667** | **1.806666667** |
| **UTV** | **1.12E-03** | **4.60E-03** | **1.18E-01** | **3.40E-06** | **0.00E+00** | **0.00E+00** | **9.25E-06** | **0.00E+00** | **0.00E+00** | **2.70E-05** |
| **2026 TOTAL** | **0.624448808** | **5.521263305** | **29.92798038** | **0.063336732** | **0.113333333** | **3.496666667** | **3.596675914** | **0.113333333** | **1.706666667** | **1.806693667** |

**Ph1: Site Prep**

| | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | tons/year | | | | | | | | | |
| **2025** | **0.02** | **0.05** | **0.30** | **0.02** | **0.02** | **0.04** | **0.04** | **0.02** | **0.03** | **0.03** |
| **2026** | **0.62** | **5.52** | **29.93** | **0.06** | **0.11** | **3.50** | **3.60** | **0.11** | **1.71** | **1.81** |

**Darden Renewable Energy Project**
**Construction CalEEMod**
**All Tier 4 Annual - 36 Month**

**Ph2: PV Panel System / 1st Site Prep (2026) [3.1]**

| | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | tons/year | | | | | | | | | |
| **CalEEMod** | **1.586666667** | **19.17** | **62.00666667** | **0.126666667** | **0.283333333** | **2.85** | **3.133333333** | **0.283333333** | **1.103333333** | **1.386666667** |
| **UTV** | **1.85E-02** | **7.64E-02** | **1.96E+00** | **5.65E-05** | **0.00E+00** | **0.00E+00** | **1.54E-04** | **0.00E+00** | **0.00E+00** | **4.49E-04** |
| **2026 TOTAL** | **1.605204417** | **19.24639017** | **63.9673478** | **0.126723146** | **0.283333333** | **2.85** | **3.133487006** | **0.283333333** | **1.103333333** | **1.387115384** |

**Ph2: PV Panel System / 1st Site Prep (2027) [3.3]**

| | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | tons/year | | | | | | | | | |
| **CalEEMod** | **2.663333333** | **32.2** | **104.8966667** | **0.186666667** | **0.48** | **4.873333333** | **5.353333333** | **0.47** | **1.856666667** | **2.326666667** |
| **UTV** | **3.14E-02** | **1.29E-01** | **3.32E+00** | **9.57E-05** | **0.00E+00** | **0.00E+00** | **2.60E-04** | **0.00E+00** | **0.00E+00** | **7.60E-04** |
| **2027 TOTAL** | **2.694751208** | **32.32946646** | **108.2196392** | **0.186762388** | **0.48** | **4.873333333** | **5.353593779** | **0.47** | **1.856666667** | **2.327427155** |

**Ph2: PV Panel System / 1st Site Prep (2028) [3.5]**

| | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | tons/year | | | | | | | | | |
| **CalEEMod** | **0.876666667** | **10.62333333** | **34.72666667** | **0.063333333** | **0.156666667** | **1.6** | **1.783333333** | **0.156666667** | **0.616666667** | **0.773333333** |
| **UTV** | **3.14E-02** | **4.22E-02** | **1.08E+00** | **9.57E-05** | **0.00E+00** | **0.00E+00** | **2.60E-04** | **0.00E+00** | **0.00E+00** | **7.60E-04** |
| **2028 TOTAL** | **0.908084542** | **10.66549674** | **35.8088608** | **0.063429055** | **0.156666667** | **1.6** | **1.783593779** | **0.156666667** | **0.616666667** | **0.774093822** |

**Darden Renewable Energy Project**
**Construction CalEEMod**
**All Tier 4 Annual - 36 Month**

**Ph2: PV Panel System**

| | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | tons/year | | | | | | | | | |
| **2026** | **1.61** | **19.25** | **63.97** | **0.13** | **0.28** | **2.85** | **3.13** | **0.28** | **1.10** | **1.39** |
| **2027** | **2.69** | **32.33** | **108.22** | **0.19** | **0.48** | **4.87** | **5.35** | **0.47** | **1.86** | **2.33** |
| **2028** | **0.91** | **10.67** | **35.81** | **0.06** | **0.16** | **1.60** | **1.78** | **0.16** | **0.62** | **0.77** |

**Ph3: Inverters, etc / 1st Building Construction (2027) [3.17]**

| | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | tons/year | | | | | | | | | |
| CalEEMod | 0.666666667 | 8.846666667 | 29.19333333 | 0.053333333 | 0.116666667 | 0.663333333 | 0.78 | 0.116666667 | 0.183333333 | 0.3 |
| UTV | 6.22E-03 | 2.56E-02 | 6.58E-01 | 1.89E-05 | 0.00E+00 | 0.00E+00 | 5.16E-05 | 0.00E+00 | 0.00E+00 | 1.51E-04 |
| **2027 TOTAL** | **0.672886042** | **8.872295405** | **29.85113761** | **0.053352282** | **0.116666667** | **0.663333333** | **0.780051557** | **0.116666667** | **0.183333333** | **0.300150544** |

# Darden Renewable Energy Project
# Construction CalEEMod
# All Tier 4 Annual - 36 Month

**Ph3: Inverters, etc / 1st Building Construction (2028) [3.19]**

| | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | tons/year | | | | | | | | | |
| CalEEMod | 0.363333333 | 4.88 | 16.18 | 0.033333333 | 0.076666667 | 0.35 | 0.426666667 | 0.076666667 | 0.11 | 0.16 |
| UTV | 9.63E-05 | 1.59E-03 | 4.07E-02 | 2.93E-07 | 0.00E+00 | 0.00E+00 | 7.98E-07 | 0.00E+00 | 0.00E+00 | 2.33E-06 |
| Helicopter | 0.252 | 2.30292 | 1.79892 | 0.17226 | | | 0.28026 | | | 0.27774 |
| **2028 TOTAL** | **0.615429633** | **7.184507328** | **18.01966143** | **0.205593627** | **0.076666667** | **0.35** | **0.706927465** | **0.076666667** | **0.11** | **0.437742331** |

**Ph3: Inverters, etc**

| | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | tons/year | | | | | | | | | |
| **2027** | **0.67** | **8.87** | **29.85** | **0.05** | **0.12** | **0.66** | **0.78** | **0.12** | **0.18** | **0.30** |
| **2028** | **0.62** | **7.18** | **18.02** | **0.21** | **0.08** | **0.35** | **0.71** | **0.08** | **0.11** | **0.44** |

**Ph4: Gen-tie / 2nd Building Construction (2027) [3.21]**

| | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | tons/year | | | | | | | | | |
| CalEEMod | 0.013333333 | 0.16 | 0.026666667 | 0.013333333 | 0.013333333 | 0.053333333 | 0.053333333 | 0.013333333 | 0.013333333 | 0.026666667 |
| UTV | 9.63E-05 | 3.97E-04 | 1.02E-02 | 2.93E-07 | 0.00E+00 | 0.00E+00 | 7.98E-07 | 0.00E+00 | 0.00E+00 | 2.33E-06 |
| **2027 TOTAL** | **0.01** | **0.16** | **0.04** | **0.01** | **0.01** | **0.05** | **0.05** | **0.01** | **0.01** | **0.03** |

# Darden Renewable Energy Project
# Construction CalEEMod
# All Tier 4 Annual - 36 Month

**Ph4: Gen-tie / 2nd Building Construction (2028) [3.23]**

| | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | tons/year | | | | | | | | | |
| CalEEMod | 0.103333333 | 2.306666667 | 3.296666667 | 0.013333333 | 0.023333333 | 0.236666667 | 0.246666667 | 0.023333333 | 0.063333333 | 0.073333333 |
| UTV | 9.63E-05 | 1.59E-03 | 4.07E-02 | 2.93E-07 | 0.00E+00 | 0.00E+00 | 7.98E-07 | 0.00E+00 | 0.00E+00 | 2.33E-06 |
| Helicopter | 0.756 | 6.90876 | 5.39676 | 0.51678 | 0.84078 | | 0.84078 | 0.83322 | | 0.83322 |
| **2028 TOTAL** | **0.86** | **9.22** | **8.73** | **0.53** | **0.86** | **0.24** | **1.09** | **0.86** | **0.06** | **0.91** |

**Ph4: Gen-tie**

| | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | tons/year | | | | | | | | | |
| **2027** | **0.01** | **0.16** | **0.04** | **0.01** | **0.01** | **0.05** | **0.05** | **0.01** | **0.01** | **0.03** |
| **2028** | **0.86** | **9.22** | **8.73** | **0.53** | **0.86** | **0.24** | **1.09** | **0.86** | **0.06** | **0.91** |

# Darden Renewable Energy Project
# Construction CalEEMod
# All Tier 4 Annual - 36 Month

**Ph5: Battery Storage / 3rd Building Construction (2028) [3.25]**

| | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | tons/year | | | | | | | | | |
| CalEEMod | 0.206666667 | 5.05 | 6.75 | 0.036666667 | 0.073333333 | 0.676666667 | 0.75 | 0.073333333 | 0.18 | 0.253333333 |
| UTV | 6.42E-04 | 2.65E-03 | 6.79E-02 | 1.96E-06 | 0.00E+00 | 0.00E+00 | 5.32E-06 | 0.00E+00 | 0.00E+00 | 1.55E-05 |
| 2028 TOTAL | 0.207308667 | 5.052645547 | 6.817902377 | 0.036668623 | 0.073333333 | 0.676666667 | 0.750005322 | 0.073333333 | 0.18 | 0.253348873 |

**0**

| | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | tons/year | | | | | | | | | |
| CalEEMod | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| UTV | | | | | | | | | | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Ph5: Battery Storage**

| | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | tons/year | | | | | | | | | |
| 2028 | 0.21 | 5.05 | 6.82 | 0.04 | 0.07 | 0.68 | 0.75 | 0.07 | 0.18 | 0.25 |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

**Darden Renewable Energy Project**
**Construction CalEEMod**
**All Tier 4 Annual - 36 Month**

**Ph6: Hydrogen / 2nd Site Prep (2028) [3.7]**

| | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | tons/year | | | | | | | | | |
| CalEEMod | **1.613333333** | **20.06** | **81.11666667** | **0.156666667** | **0.376666667** | **4.656666667** | **5.033333333** | **0.376666667** | **1.93** | **2.306666667** |
| UTV | **1.61E-03** | **6.61E-03** | **1.70E-01** | **4.89E-06** | **0.00E+00** | **0.00E+00** | **1.33E-05** | **0.00E+00** | **0.00E+00** | **3.89E-05** |
| **2028 TOTAL** | **1.614938333** | **20.06661387** | **81.28642261** | **0.156671557** | **0.376666667** | **4.656666667** | **5.033346638** | **0.376666667** | **1.93** | **2.306705517** |

**0**

| | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | tons/year | | | | | | | | | |
| CalEEMod | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** |
| UTV | | | | | | | | | | |
| **2029 TOTAL** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** |

**Ph6: Hydrogen**

| | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | tons/year | | | | | | | | | |
| **2028** | **1.61** | **20.07** | **81.29** | **0.16** | **0.38** | **4.66** | **5.03** | **0.38** | **1.93** | **2.31** |
| **2029** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** |

## Darden Renewable Energy Project
## Construction CalEEMod
## All Tier 4 Annual - 36 Month

**Ph7: Utility Switchyard**

| | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | tons/year | | | | | | | | | |
| **2026** | **0.54** | **6.57** | **25.36** | **0.05** | **0.10** | **1.00** | **1.12** | **0.10** | **0.45** | **0.54** |
| **2027** | **0.16** | **1.94** | **7.55** | **0.02** | **0.04** | **0.30** | **0.33** | **0.04** | **0.14** | **0.17** |

## Darden Renewable Energy Project
## ATV Emissions Calculations - 36-Month

### ***Assumptions***

| ATV/UTV | HP | |
|---|---|---|
| Honda Pioneer 700 | 36.1 | |
| Polaris XP 1000 | 82 | 0 |
| Kawaski Mule Pro-FXT | 47 | |
| Polaris Ranger 500 | 32 | |
| #VALUE! | 82 | |
| CAN-AM DEFENDER MAX HD10 LONE STAR | 82 | |
| Honda Pioneer 700 | 72 | |
| POLARIS GENERAL XP 4 1000 DELUXE | 100 | |
| POLARIS RANGER CREW XP 1000 PREMIUM | 82 | |
| YAMAHA VIKING VI EPS RANCH EDITION | N/A | |

Note: Top 10 UTVs of 2022

| ***Ph1: Site Prep (2025)*** | | |
|---|---|---|
| HP assumed for analysis | 100 | |
| # UTVs | 10 | |
| Hrs of Operation | 5 | |
| Total UTV hours of operation per day | 50 | |
| days per year | 1 | 12/31/2025 |
| Total UTV Hours of operation per year | 50 | |

**Darden Renewable Energy Project**
**ATV Emissions Calculations - 36-Month**

***<u>Emissions Calculations</u>***

g/hpH[1]

| | |
|---|---|
| NOx | 0.6 |
| CO | 15.4 |

Emissions

| | g/HPh | hpH/day | g/day | lbs/gr | lbs/day | days/yr | lbs/year |
|---|---|---|---|---|---|---|---|
| NOx | 0.6 | 50 | 30 | 0.002205 | 0.066139 | 155 | 10.2515 |
| CO | 15.4 | 50 | 770 | 0.002205 | 1.697559 | 155 | 263.1217 |
| CO2e | | | | | | | |

| | lbs/year | tons/lb | tons/yr |
|---|---|---|---|
| NOx | 10.2515 | 0.0005 | 0.005126 |
| CO | 263.1217 | 0.0005 | 0.131561 |

1 CARB 2022. Off-Highway Recreational Vehicle Emissions Certification Requirements. https://ww2.arb.ca.gov/highway-recreational-vehicle-emissions-certification-requirements

| | |
|---|---|
| 15 | miles per hour |
| 50 | hours per day |
| 750 | miles per hour |
| 10 | miles per gallon |
| 75 | gallons per day |

| emissions per gallon | ROG | SOx | PM10 | PM2.5 | CO2 | MT CO2e |
|---|---|---|---|---|---|---|
| tons/gallon | 1.07E-07 | 3.26E-10 | 8.87E-10 | 2.59E-09 | 2.42E-05 | |
| tons/day | 8.03E-06 | 2.45E-08 | 6.65E-08 | 1.94E-07 | 1.82E-03 | |
| tons/year | 8.03E-06 | 2.45E-08 | 6.65E-08 | 1.94E-07 | 1.82E-03 | 1.65E-03 |
| lbs/day | 1.61E-02 | 4.89E-05 | 1.33E-04 | 3.89E-04 | 3.63E+00 | |

**Darden Renewable Energy Project**
**ATV Emissions Calculations - 36-Month**

| ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|
| 8.03E-06 | 0.005125748 | 1.32E-01 | 2.45E-08 | | | 6.65E-08 | | | 1.94E-07 |

| ***Ph1: Site Prep (2026)*** | | |
|---|---|---|
| HP assumed for analysis | 8.03E-06 | |
| # UTVs | 10 | |
| Hrs of Operation | 5 | |
| Total UTV hours of operation per day | 50 | |
| days per year | 139 | based on provided start/end dates and number of days per phase |
| Total UTV Hours of operation per year | 6950 | |

g/hpH[1]

| | |
|---|---|
| NOx | 0.6 |
| CO | 15.4 |

Emissions

| | **g/HPh** | **hpH/day** | **g/day** | **lbs/gr** | **lbs/day** | **days/yr** | **lbs/year** |
|---|---|---|---|---|---|---|---|
| NOx | 0.6 | 50 | 30 | 0.002205 | 0.066139 | 139 | 9.193276 |
| CO | 15.4 | 50 | 770 | 0.002205 | 1.697559 | 139 | 235.9608 |
| CO2e | | | | | | | |

| | **lbs/year** | **tons/lb** | **tons/yr** |
|---|---|---|---|
| NOx | 9.193276 | 0.0005 | 0.004597 |
| CO | 235.9608 | 0.0005 | 0.11798 |

**Darden Renewable Energy Project**
**ATV Emissions Calculations - 36-Month**

15 miles per hour
50 hours per day
750 miles per hour
10 miles per gallon
75 gallons per day

| emissions per gallon | ROG | SOx | PM10 | PM2.5 | CO2 | MT CO2e |
|---|---|---|---|---|---|---|
| tons/gallon | 1.07E-07 | 3.26E-10 | 8.87E-10 | 2.59E-09 | 2.42E-05 | |
| tons/day | 8.03E-06 | 2.45E-08 | 6.65E-08 | 1.94E-07 | 1.82E-03 | |
| tons/year | 1.12E-03 | 3.40E-06 | 9.25E-06 | 2.70E-05 | 2.52E-01 | 2.29E-01 |
| lbs/day | 1.61E-02 | 4.89E-05 | 1.33E-04 | 3.89E-04 | 3.63E+00 | |

| ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|
| 1.12E-03 | 0.004596638 | 1.18E-01 | 3.40E-06 | | | 9.25E-06 | | | 2.70E-05 |

**Darden Renewable Energy Project**
**ATV Emissions Calculations - 36-Month**

***Ph2: PV Panel System (2026)***

| | | |
|---|---|---|
| HP assumed for analysis | 100 | |
| # UTVs | 150 | |
| Hrs of Operation | 5 | |
| Total UTV hours of operation per day | 750 | |
| days per year | 154 | 5/1/2026 to 12/31/2026 |
| Total UTV Hours of operation per year | 115500 | |

***Emissions Calculations***

| g/hpH[1] | |
|---|---|
| NOx | 0.6 |
| CO | 15.4 |

| Emissions | **g/HPh** | **hpH/day** | **g/day** | **lbs/gr** | **lbs/day** | **days/yr** | **lbs/year** |
|---|---|---|---|---|---|---|---|
| NOx | 0.6 | 750 | 450 | 0.002205 | 0.99208 | 154 | 152.7803 |
| CO | 15.4 | 750 | 11550 | 0.002205 | 25.46339 | 154 | 3921.362 |
| CO2e | | | | | | | |

| | **lbs/year** | **tons/lb** | **tons/yr** |
|---|---|---|---|
| NOx | 152.7803 | 0.0005 | 0.07639 |
| CO | 3921.362 | 0.0005 | 1.960681 |

| | |
|---|---|
| 15 | miles per hour |
| 750 | hours per day |
| 11250 | miles per hour |
| 10 | miles per gallon |
| 1125 | gallons per day |

**Darden Renewable Energy Project**
**ATV Emissions Calculations - 36-Month**

***Ph2: PV Panel System (2026)***

| emissions per gallon | ROG | SOx | PM10 | PM2.5 | CO2 | MT CO2e |
|---|---|---|---|---|---|---|
| tons/gallon | 1.07E-07 | 3.26E-10 | 8.87E-10 | 2.59E-09 | 2.42E-05 | |
| tons/day | 1.20E-04 | 3.67E-07 | 9.98E-07 | 2.91E-06 | 2.72E-02 | |
| tons/year | 1.85E-02 | 5.65E-05 | 1.54E-04 | 4.49E-04 | 4.19E+00 | 3.80E+00 |
| lbs/day | 2.41E-01 | 7.34E-04 | 2.00E-03 | 5.83E-03 | 5.45E+01 | |

| ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|
| 1.85E-02 | 0.076390174 | 1.96E+00 | 5.65E-05 | | | 1.54E-04 | | | 4.49E-04 |

***Ph2: PV Panel System (2027)***

| | | |
|---|---|---|
| HP assumed for analysis | 100 | |
| # UTVs | 150 | |
| Hrs of Operation | 5 | |
| Total UTV hours of operation per day | 750 | |
| days per year | 261 | 1/1/2027 to 12/31/2027 |
| Total UTV Hours of operation per year | 195750 | |

***Emissions Calculations***

| g/hpH[1] | |
|---|---|
| NOx | 0.6 |
| CO | 15.4 |

| Emissions | **g/HPh** | **hpH/day** | **g/day** | **lbs/gr** | **lbs/day** | **days/yr** | **lbs/year** |
|---|---|---|---|---|---|---|---|
| NOx | 0.6 | 750 | 450 | 0.002205 | 0.99208 | 261 | 258.9329 |
| CO | 15.4 | 750 | 11550 | 0.002205 | 25.46339 | 261 | 6645.945 |
| CO2e | | | | | | | |

| | **lbs/year** | **tons/lb** | **tons/yr** |
|---|---|---|---|
| NOx | 258.9329 | 0.0005 | 0.129466 |
| CO | 6645.945 | 0.0005 | 3.322973 |

**Darden Renewable Energy Project**
**ATV Emissions Calculations - 36-Month**

***Ph2: PV Panel System (2026)***

| | |
|---|---|
| 15 | miles per hour |
| 750 | hours per day |
| 11250 | miles per hour |
| 10 | miles per gallon |
| 1125 | gallons per day |

| emissions per gallon | ROG | SOx | PM10 | PM2.5 | CO2 | MT CO2e |
|---|---|---|---|---|---|---|
| tons/gallon | 1.07E-07 | 3.26E-10 | 8.87E-10 | 2.59E-09 | 2.42E-05 | |
| tons/day | 1.20E-04 | 3.67E-07 | 9.98E-07 | 2.91E-06 | 2.72E-02 | |
| tons/year | 3.14E-02 | 9.57E-05 | 2.60E-04 | 7.60E-04 | 7.11E+00 | 6.45E+00 |
| lbs/day | 2.41E-01 | 7.34E-04 | 2.00E-03 | 5.83E-03 | 5.45E+01 | |

| ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|
| 3.14E-02 | 0.129466463 | 3.32E+00 | 9.57E-05 | | | 2.60E-04 | | | 7.60E-04 |

***Ph2: PV Panel System (2028)***

| | | |
|---|---|---|
| HP assumed for analysis | 100 | |
| # UTVs | 150 | |
| Hrs of Operation | 5 | |
| Total UTV hours of operation per day | 750 | |
| days per year | 85 | 1/1/2028 to 4/30/2028 |
| Total UTV Hours of operation per year | 63750 | |

***<u>Emissions Calculations</u>***

| | g/hpH[1] |
|---|---|
| NOx | 0.6 |
| CO | 15.4 |

**Darden Renewable Energy Project**
**ATV Emissions Calculations - 36-Month**

***Ph2: PV Panel System (2026)***

| Emissions | g/HPh | hpH/day | g/day | lbs/gr | lbs/day | days/yr | lbs/year |
|---|---|---|---|---|---|---|---|
| NOx | 0.6 | 750 | 450 | 0.002205 | 0.99208 | 85 | 84.32682 |
| CO | 15.4 | 750 | 11550 | 0.002205 | 25.46339 | 85 | 2164.388 |
| CO2e | | | | | | | |

| | lbs/year | tons/lb | tons/yr |
|---|---|---|---|
| NOx | 84.32682 | 0.0005 | 0.042163 |
| CO | 2164.388 | 0.0005 | 1.082194 |

| | |
|---|---|
| 15 | miles per hour |
| 750 | hours per day |
| 11250 | miles per hour |
| 10 | miles per gallon |
| 1125 | gallons per day |

| emissions per gallon | ROG | SOx | PM10 | PM2.5 | CO2 | MT CO2e |
|---|---|---|---|---|---|---|
| tons/gallon | 1.07E-07 | 3.26E-10 | 8.87E-10 | 2.59E-09 | 2.42E-05 | |
| tons/day | 1.20E-04 | 3.67E-07 | 9.98E-07 | 2.91E-06 | 2.72E-02 | |
| tons/year | 3.14E-02 | 9.57E-05 | 2.60E-04 | 7.60E-04 | 7.11E+00 | 6.45E+00 |
| lbs/day | 2.41E-01 | 7.34E-04 | 2.00E-03 | 5.83E-03 | 5.45E+01 | |

| ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|
| 3.14E-02 | 0.042163408 | 1.08E+00 | 9.57E-05 | | | 2.60E-04 | | | 7.60E-04 |

**Darden Renewable Energy Project**
**ATV Emissions Calculations - 36-Month**

***Ph3: Inverters, Transformers, Substation, Electrical (2027)***

| | | |
|---|---|---|
| HP assumed for analysis | 100 | |
| # UTVs | 50 | |
| Hrs of Operation | 5 | |
| Total UTV hours of operation per day | 250 | |
| days per year | 155 | 5/30/2027 to 12/31/2027 |
| Total UTV Hours of operation per year | 38750 | |

***<u>Emissions Calculations</u>***

| g/hpH[1] | |
|---|---|
| NOx | 0.6 |
| CO | 15.4 |

| Emissions | **g/HPh** | **hpH/day** | **g/day** | **lbs/gr** | **lbs/day** | **days/yr** | **lbs/year** |
|---|---|---|---|---|---|---|---|
| NOx | 0.6 | 250 | 150 | 0.002205 | 0.330693 | 155 | 51.25748 |
| CO | 15.4 | 250 | 3850 | 0.002205 | 8.487797 | 155 | 1315.609 |
| CO2e | | | | | | | |

| | **lbs/year** | **tons/lb** | **tons/yr** |
|---|---|---|---|
| NOx | 51.25748 | 0.0005 | 0.025629 |
| CO | 1315.609 | 0.0005 | 0.657804 |

| | |
|---|---|
| 15 | miles per hour |
| 250 | hours per day |
| 3750 | miles per hour |
| 10 | miles per gallon |
| 375 | gallons per day |

**Darden Renewable Energy Project**
**ATV Emissions Calculations - 36-Month**

***Ph3: Inverters, Transformers, Substation, Electrical (2027)***

| emissions per gallon | ROG | SOx | PM10 | PM2.5 | CO2 | MT CO2e |
|---|---|---|---|---|---|---|
| tons/gallon | 1.07E-07 | 3.26E-10 | 8.87E-10 | 2.59E-09 | 2.42E-05 | |
| tons/day | 4.01E-05 | 1.22E-07 | 3.33E-07 | 9.71E-07 | 9.08E-03 | |
| tons/year | 6.22E-03 | 1.89E-05 | 5.16E-05 | 1.51E-04 | 1.41E+00 | 1.28E+00 |
| lbs/day | 8.03E-02 | 2.45E-04 | 6.65E-04 | 1.94E-03 | 1.82E+01 | |

| ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|
| 6.22E-03 | 0.025628738 | 6.58E-01 | 1.89E-05 | | | 5.16E-05 | | | 1.51E-04 |

***Ph3: Inverters, Transformers, Substation, Electrical (2028)***

| | | |
|---|---|---|
| HP assumed for analysis | 100 | |
| # UTVs | 50 | |
| Hrs of Operation | 5 | |
| Total UTV hours of operation per day | 250 | |
| days per year | 85 | 1/1/2028 to 4/29/2028 |
| Total UTV Hours of operation per year | 21250 | |

***Emissions Calculations***

| g/hpH[1] | |
|---|---|
| NOx | 0.6 |
| CO | 15.4 |

| Emissions | **g/HPh** | **hpH/day** | **g/day** | **lbs/gr** | **lbs/day** | **days/yr** | **lbs/year** |
|---|---|---|---|---|---|---|---|
| NOx | 0.6 | 250 | 150 | 0.002205 | 0.330693 | 85 | 28.10894 |
| CO | 15.4 | 250 | 3850 | 0.002205 | 8.487797 | 85 | 721.4628 |
| CO2e | | | | | | | |

| | **lbs/year** | **tons/lb** | **tons/yr** |
|---|---|---|---|
| NOx | 28.10894 | 0.0005 | 0.014054 |
| CO | 721.4628 | 0.0005 | 0.360731 |

**Darden Renewable Energy Project**
**ATV Emissions Calculations - 36-Month**

***Ph3: Inverters, Transformers, Substation, Electrical (2027)***

| | |
|---|---|
| 15 | miles per hour |
| 250 | hours per day |
| 3750 | miles per hour |
| 10 | miles per gallon |
| 375 | gallons per day |

| emissions per gallon | ROG | SOx | PM10 | PM2.5 | CO2 | MT CO2e |
|---|---|---|---|---|---|---|
| tons/gallon | 1.07E-07 | 3.26E-10 | 8.87E-10 | 2.59E-09 | 2.42E-05 | |
| tons/day | 4.01E-05 | 1.22E-07 | 3.33E-07 | 9.71E-07 | 9.08E-03 | |
| tons/year | 1.00E-02 | 3.06E-05 | 8.32E-05 | 2.43E-04 | 2.27E+00 | 2.06E+00 |
| lbs/day | 8.03E-02 | 2.45E-04 | 6.65E-04 | 1.94E-03 | 1.82E+01 | |

| ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|
| 1.00E-02 | 0.014054469 | 3.61E-01 | 3.06E-05 | | | 8.32E-05 | | | 2.43E-04 |

**Darden Renewable Energy Project**
**ATV Emissions Calculations - 36-Month**

| | | |
|---|---|---|
| ***Ph4: Gen-tie (2027)*** | | |
| HP assumed for analysis | 100 | |
| # UTVs | 5 | |
| Hrs of Operation | 5 | |
| Total UTV hours of operation per day | 25 | |
| days per year | 24 | 11/30/2027 to 12/31/2027 |
| Total UTV Hours of operation per year | 600 | |

***Emissions Calculations***

| g/hpH[1] | |
|---|---|
| NOx | 0.6 |
| CO | 15.4 |

| Emissions | **g/HPh** | **hpH/day** | **g/day** | **lbs/gr** | **lbs/day** | **days/yr** | **lbs/year** |
|---|---|---|---|---|---|---|---|
| NOx | 0.6 | 25 | 15 | 0.002205 | 0.033069 | 24 | 0.793664 |
| CO | 15.4 | 25 | 385 | 0.002205 | 0.84878 | 24 | 20.37071 |
| CO2e | | | | | | | |

| | **lbs/year** | **tons/lb** | **tons/yr** |
|---|---|---|---|
| NOx | 0.793664 | 0.0005 | 0.000397 |
| CO | 20.37071 | 0.0005 | 0.010185 |

| | |
|---|---|
| 15 | miles per hour |
| 25 | hours per day |
| 375 | miles per hour |
| 10 | miles per gallon |
| 37.5 | gallons per day |

**Darden Renewable Energy Project**
**ATV Emissions Calculations - 36-Month**

***Ph4: Gen-tie (2027)***

| emissions per gallon | ROG | SOx | PM10 | PM2.5 | CO2 | MT CO2e |
|---|---|---|---|---|---|---|
| tons/gallon | 1.07E-07 | 3.26E-10 | 8.87E-10 | 2.59E-09 | 2.42E-05 | |
| tons/day | 4.01E-06 | 1.22E-08 | 3.33E-08 | 9.71E-08 | 9.08E-04 | |
| tons/year | 9.63E-05 | 2.93E-07 | 7.98E-07 | 2.33E-06 | 2.18E-02 | 1.98E-02 |
| lbs/day | 8.03E-03 | 2.45E-05 | 6.65E-05 | 1.94E-04 | 1.82E+00 | |

| ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|
| 9.63E-05 | 0.000396832 | 1.02E-02 | 2.93E-07 | | | 7.98E-07 | | | 2.33E-06 |

***Ph4: Gen-tie (2028)***

| | | |
|---|---|---|
| HP assumed for analysis | 100 | |
| # UTVs | 5 | |
| Hrs of Operation | 5 | |
| Total UTV hours of operation per day | 25 | |
| days per year | 96 | 1/1/2028 to 5/15/2028 |
| Total UTV Hours of operation per year | 2400 | |

***Emissions Calculations***

g/hpH[1]

| | |
|---|---|
| NOx | 0.6 |
| CO | 15.4 |

| Emissions | **g/HPh** | **hpH/day** | **g/day** | **lbs/gr** | **lbs/day** | **days/yr** | **lbs/year** |
|---|---|---|---|---|---|---|---|
| NOx | 0.6 | 25 | 15 | 0.002205 | 0.033069 | 96 | 3.174657 |
| CO | 15.4 | 25 | 385 | 0.002205 | 0.84878 | 96 | 81.48285 |
| CO2e | | | | | | | |

| | **lbs/year** | **tons/lb** | **tons/yr** |
|---|---|---|---|
| NOx | 3.174657 | 0.0005 | 0.001587 |
| CO | 81.48285 | 0.0005 | 0.040741 |

**Darden Renewable Energy Project**
**ATV Emissions Calculations - 36-Month**

***Ph4: Gen-tie (2027)***

| | |
|---|---|
| 15 | miles per hour |
| 25 | hours per day |
| 375 | miles per hour |
| 10 | miles per gallon |
| 37.5 | gallons per day |

| emissions per gallon | ROG | SOx | PM10 | PM2.5 | CO2 | MT CO2e |
|---|---|---|---|---|---|---|
| tons/gallon | 1.07E-07 | 3.26E-10 | 8.87E-10 | 2.59E-09 | 2.42E-05 | |
| tons/day | 4.01E-06 | 1.22E-08 | 3.33E-08 | 9.71E-08 | 9.08E-04 | |
| tons/year | 9.63E-05 | 2.93E-07 | 7.98E-07 | 2.33E-06 | 2.18E-02 | 1.98E-02 |
| lbs/day | 8.03E-03 | 2.45E-05 | 6.65E-05 | 1.94E-04 | 1.82E+00 | |

| ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|
| 9.63E-05 | 0.001587328 | 4.07E-02 | 2.93E-07 | | | 7.98E-07 | | | 2.33E-06 |

**Darden Renewable Energy Project**
**ATV Emissions Calculations - 36-Month**

***Ph5: Battery Storage (2028)***

| | | |
|---|---|---|
| HP assumed for analysis | 100 | |
| # UTVs | 5 | |
| Hrs of Operation | 5 | |
| Total UTV hours of operation per day | 25 | |
| days per year | 160 | 1/30/2028 to 9/8/2028 |
| Total UTV Hours of operation per year | 4000 | |

***<u>Emissions Calculations</u>***

| g/hpH[1] | |
|---|---|
| NOx | 0.6 |
| CO | 15.4 |

| Emissions | g/HPh | hpH/day | g/day | lbs/gr | lbs/day | days/yr | lbs/year |
|---|---|---|---|---|---|---|---|
| NOx | 0.6 | 25 | 15 | 0.002205 | 0.033069 | 160 | 5.291094 |
| CO | 15.4 | 25 | 385 | 0.002205 | 0.84878 | 160 | 135.8048 |
| CO2e | | | | | | | |

| | lbs/year | tons/lb | tons/yr |
|---|---|---|---|
| NOx | 5.291094 | 0.0005 | 0.002646 |
| CO | 135.8048 | 0.0005 | 0.067902 |

| | |
|---|---|
| 15 | miles per hour |
| 25 | hours per day |
| 375 | miles per hour |
| 10 | miles per gallon |
| 37.5 | gallons per day |

**Darden Renewable Energy Project**
**ATV Emissions Calculations - 36-Month**

***Ph5: Battery Storage (2028)***

| emissions per gallon | ROG | SOx | PM10 | PM2.5 | CO2 | MT CO2e |
|---|---|---|---|---|---|---|
| tons/gallon | 1.07E-07 | 3.26E-10 | 8.87E-10 | 2.59E-09 | 2.42E-05 | |
| tons/day | 4.01E-06 | 1.22E-08 | 3.33E-08 | 9.71E-08 | 9.08E-04 | |
| tons/year | 6.42E-04 | 1.96E-06 | 5.32E-06 | 1.55E-05 | 1.45E-01 | 1.32E-01 |
| lbs/day | 8.03E-03 | 2.45E-05 | 6.65E-05 | 1.94E-04 | 1.82E+00 | |

| ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|
| 6.42E-04 | 0.002645547 | 6.79E-02 | 1.96E-06 | | | 5.32E-06 | | | 1.55E-05 |

## Darden Renewable Energy Project
## ATV Emissions Calculations - 36-Month

| ***Ph6: Hydrogen (2028)*** | | |
|---|---|---|
| HP assumed for analysis | 100 | |
| # UTVs | 10 | |
| Hrs of Operation | 5 | |
| Total UTV hours of operation per day | 50 | |
| days per year | 200 | 2/29/2028 to 12/4/2028 |
| Total UTV Hours of operation per year | 10000 | |

***<u>Emissions Calculations</u>***

| g/hpH[1] | |
|---|---|
| NOx | 0.6 |
| CO | 15.4 |

| Emissions | **g/HPh** | **hpH/day** | **g/day** | **lbs/gr** | **lbs/day** | **days/yr** | **lbs/year** |
|---|---|---|---|---|---|---|---|
| NOx | 0.6 | 50 | 30 | 0.002205 | 0.066139 | 200 | 13.22774 |
| CO | 15.4 | 50 | 770 | 0.002205 | 1.697559 | 200 | 339.5119 |
| CO2e | | | | | | | |

| | **lbs/year** | **tons/lb** | **tons/yr** |
|---|---|---|---|
| NOx | 13.22774 | 0.0005 | 0.006614 |
| CO | 339.5119 | 0.0005 | 0.169756 |

| | |
|---|---|
| 15 | miles per hour |
| 50 | hours per day |
| 750 | miles per hour |
| 10 | miles per gallon |
| 75 | gallons per day |

**Darden Renewable Energy Project**
**ATV Emissions Calculations - 36-Month**

***Ph6: Hydrogen (2028)***

| emissions per gallon | ROG | SOx | PM10 | PM2.5 | CO2 | MT CO2e |
|---|---|---|---|---|---|---|
| tons/gallon | 1.07E-07 | 3.26E-10 | 8.87E-10 | 2.59E-09 | 2.42E-05 | |
| tons/day | 8.03E-06 | 2.45E-08 | 6.65E-08 | 1.94E-07 | 1.82E-03 | |
| tons/year | 1.61E-03 | 4.89E-06 | 1.33E-05 | 3.89E-05 | 3.63E-01 | 3.29E-01 |
| lbs/day | 1.61E-02 | 4.89E-05 | 1.33E-04 | 3.89E-04 | 3.63E+00 | |

| ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|
| 1.61E-03 | 0.006613868 | 1.70E-01 | 4.89E-06 | | | 1.33E-05 | | | 3.89E-05 |

# Darden Renewable Energy Project
## Construction CalEEMod
## Tier 4 Construction Fleet - 18-Month

**Ph1: Site Prep / Grading (2025) [3.11]**

| | | TOG | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Category | tons/year | | | | | | | | | | |
| | Off-Road | 0.01 | 0.01 | 0.14 | 0.22 | < 0.005 | 0.01 | | 0.01 | < 0.005 | | < 0.005 |
| | Dust | | | | | | | 0.04 | 0.04 | | 0.02 | 0.02 |
| | On-Site Truck | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Worker | 0.005 | 0.005 | 0.005 | 0.005 | 0 | 0 | 0.005 | 0.005 | 0 | 0.005 | 0.005 |
| | Vendor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 160 | Hauling 160 mi | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| | **Total** | **0.028333333** | **0.028333333** | **0.158333333** | **0.238333333** | **0.013333333** | **0.023333333** | **0.058333333** | **0.068333333** | **0.013333333** | **0.038333333** | **0.038333333** |
| 60 | Hauling 60 mi | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 |

**Ph1: Site Prep / Grading (2026) [3.13]**

| | TOG | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/year | | | | | | | | | | |
| Off-Road | 2.01 | 1.75 | 18.6 | 30.7 | 0.05 | 0.72 | | 0.72 | 0.67 | | 0.67 |
| Dust | | | | | | | 4.46 | 4.46 | | 2.2 | 2.2 |
| On-Site Truck | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Worker | 0.07 | 0.06 | 0.04 | 0.5 | 0 | 0 | 0.1 | 0.1 | 0 | 0.02 | 0.02 |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hauling 160 mi | 0.01 | 0.01 | 0.37 | 0.05 | 0.01 | 0.01 | 0.08 | 0.11 | 0.01 | 0.03 | 0.03 |
| **Total** | **2.093333333** | **1.823333333** | **19.01333333** | **31.25333333** | **0.063333333** | **0.733333333** | **4.64** | **5.386666667** | **0.683333333** | **2.246666667** | **2.916666667** |
| Hauling 60 mi | 0.005 | 0.005 | 0.14 | 0.02 | 0.005 | 0.005 | 0.03 | 0.04 | 0.005 | 0.01 | 0.01 |

**Darden Renewable Energy Project**
**Construction CalEEMod**
**Tier 4 Construction Fleet - 18-Month**

**Ph2: PV Panel System / 1st Site Prep (2026) [3.1]**

| | TOG | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/year | | | | | | | | | | |
| Off-Road | 2.27 | 2.27 | 30.8 | 123 | 0.19 | 0.39 | | 0.39 | 0.39 | | 0.39 |
| Fugitive Dust | | | | | | | 4.9 | 4.9 | | 2.32 | 2.32 |
| On-site Truck | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Worker | 0.68 | 0.63 | 0.4 | 4.95 | 0 | 0 | 0.94 | 0.94 | 0 | 0.22 | 0.22 |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hauling 160 mi | 0.03 | 0.01 | 0.91 | 0.16 | 0.01 | 0.03 | 0.21 | 0.24 | 0.03 | 0.05 | 0.08 |
| **Total** | **2.976666667** | **2.913333333** | **32.10666667** | **128.11** | **0.203333333** | **0.416666667** | **6.053333333** | **6.47** | **0.416666667** | **2.593333333** | **3.01** |
| Hauling 60 mi | 0.01 | 0.005 | 0.34 | 0.06 | 0.005 | 0.01 | 0.08 | 0.09 | 0.01 | 0.02 | 0.03 |

**Ph2: PV Panel System / 1st Site Prep (2027) [3.3]**

| | TOG | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/year | | | | | | | | | | |
| Off-Road | 1.04 | 1.04 | 14.1 | 56.3 | 0.09 | 0.18 | | 0.18 | 0.18 | | 0.18 |
| Fugitive Dust | | | | | | | 2.25 | 2.25 | | 1.07 | 1.07 |
| On-site Truck | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Worker | 0.28 | 0.27 | 0.17 | 2.1 | 0 | 0 | 0.43 | 0.43 | 0 | 0.1 | 0.1 |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hauling 160 mi | 0.01 | 0.01 | 0.40 | 0.08 | 0.01 | 0.01 | 0.11 | 0.11 | 0.01 | 0.03 | 0.03 |
| **Total** | **1.333333333** | **1.323333333** | **14.67** | **58.48** | **0.103333333** | **0.193333333** | **2.786666667** | **2.966666667** | **0.193333333** | **1.196666667** | **1.376666667** |
| Hauling 60 mi | 0.005 | 0.005 | 0.15 | 0.03 | 0.005 | 0.005 | 0.04 | 0.04 | 0.005 | 0.01 | 0.01 |

**Darden Renewable Energy Project**
**Construction CalEEMod**
**Tier 4 Construction Fleet - 18-Month**

| | TOG | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/year | | | | | | | | | | |
| Off-Road | | | | | | | | | | | |
| Fugitive Dust | | | | | | | | | | | |
| On-Site Truck | | | | | | | | | | | |
| Worker | | | | | | | | | | | |
| Vendor | | | | | | | | | | | |
| Hauling | | | | | | | | | | | |
| **Total** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** |

Ph3: Inverters, etc / 1st Building Construction (2026) [3.15]

| | TOG | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/year | | | | | | | | | | |
| Off-Road | 0.62 | 0.62 | 8.22 | 33.9 | 0.05 | 0.11 | | 0.11 | 0.11 | | 0.11 |
| On-Site Truck | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Worker | 0.17 | 0.15 | 0.1 | 1.21 | 0 | 0 | 0.23 | 0.23 | 0 | 0.05 | 0.05 |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hauling 160 mi | 0.05 | 0.03 | 2.19 | 0.37 | 0.01 | 0.03 | 0.53 | 0.59 | 0.03 | 0.16 | 0.19 |
| **Total** | **0.843333333** | **0.796666667** | **10.50666667** | **35.48333333** | **0.063333333** | **0.136666667** | **0.763333333** | **0.926666667** | **0.136666667** | **0.21** | **0.346666667** |
| Hauling 60 mi | 0.02 | 0.01 | 0.82 | 0.14 | 0.005 | 0.01 | 0.2 | 0.22 | 0.01 | 0.06 | 0.07 |

**Darden Renewable Energy Project**
**Construction CalEEMod**
**Tier 4 Construction Fleet - 18-Month**

Ph3: Inverters, etc / 1st Building Construction (2027) [3.17]

| | TOG | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | | | | | | tons/year | | | | | |
| Off-Road | 0.18 | 0.18 | 2.34 | 9.65 | 0.02 | 0.03 | | 0.03 | 0.03 | | 0.03 |
| On-Site Truck | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Worker | 0.04 | 0.04 | 0.03 | 0.32 | 0 | 0 | 0.07 | 0.07 | 0 | 0.02 | 0.02 |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hauling 160 mi | 0.03 | 0.01 | 0.61 | 0.11 | 0.01 | 0.01 | 0.16 | 0.16 | 0.01 | 0.05 | 0.05 |
| **Total** | **0.246666667** | **0.233333333** | **2.983333333** | **10.07666667** | **0.033333333** | **0.043333333** | **0.23** | **0.26** | **0.043333333** | **0.073333333** | **0.103333333** |
| Hauling 60 mi | 0.01 | 0.005 | 0.23 | 0.04 | 0.005 | 0.005 | 0.06 | 0.06 | 0.005 | 0.02 | 0.02 |

Ph4: Gen-tie / 2nd Building Construction (2026) [3.19]

| | TOG | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | | | | | | tons/year | | | | | |
| Off-Road | 0.08 | 0.08 | 1.96 | 3.55 | 0.01 | 0.01 | | 0.01 | 0.01 | | 0.01 |
| On-Site Truck | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Worker | 0.04 | 0.04 | 0.02 | 0.28 | 0 | 0 | 0.05 | 0.05 | 0 | 0.01 | 0.01 |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hauling 160 mi | 0.03 | 0.01 | 0.85 | 0.13 | 0.01 | 0.03 | 0.21 | 0.24 | 0.03 | 0.05 | 0.08 |
| **Total** | **0.146666667** | **0.133333333** | **2.833333333** | **3.963333333** | **0.023333333** | **0.036666667** | **0.263333333** | **0.3** | **0.036666667** | **0.063333333** | **0.1** |
| Hauling 60 mi | 0.01 | 0.005 | 0.32 | 0.05 | 0.005 | 0.01 | 0.08 | 0.09 | 0.01 | 0.02 | 0.03 |

**Darden Renewable Energy Project**
**Construction CalEEMod**
**Tier 4 Construction Fleet - 18-Month**

Ph5: Battery Storage / 3rd Building Construction (2026) [3.21]

| | TOG | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/year | | | | | | | | | | |
| Off-Road | 0.11 | 0.11 | 1.92 | 5.99 | 0.01 | 0.02 | | 0.02 | 0.02 | | 0.02 |
| On-Site Truck | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Worker | 0.03 | 0.03 | 0.02 | 0.2 | 0 | 0 | 0.04 | 0.04 | 0 | 0.01 | 0.01 |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hauling 160 mi | 0.03 | 0.01 | 0.88 | 0.16 | 0.01 | 0.03 | 0.21 | 0.24 | 0.03 | 0.05 | 0.08 |
| **Total** | **0.166666667** | **0.153333333** | **2.82** | **6.35** | **0.023333333** | **0.046666667** | **0.253333333** | **0.3** | **0.046666667** | **0.063333333** | **0.11** |
| Hauling 60 mi | 0.01 | 0.005 | 0.33 | 0.06 | 0.005 | 0.01 | 0.08 | 0.09 | 0.01 | 0.02 | 0.03 |

Ph5: Battery Storage / 3rd Building Construction (2027) [3.23]

| | TOG | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/year | | | | | | | | | | |
| Off-Road | 0.17 | 0.17 | 3.04 | 9.49 | 0.01 | 0.03 | | 0.03 | 0.03 | | 0.03 |
| On-Site Truck | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Worker | 0.04 | 0.04 | 0.02 | 0.29 | 0 | 0 | 0.06 | 0.06 | 0 | 0.01 | 0.01 |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hauling 160 mi | 0.03 | 0.01 | 1.33 | 0.21 | 0.01 | 0.03 | 0.35 | 0.37 | 0.03 | 0.08 | 0.11 |
| **Total** | **0.236666667** | **0.223333333** | **4.393333333** | **9.993333333** | **0.023333333** | **0.056666667** | **0.406666667** | **0.463333333** | **0.056666667** | **0.09** | **0.146666667** |
| Hauling 60 mi | 0.01 | 0.005 | 0.5 | 0.08 | 0.005 | 0.01 | 0.13 | 0.14 | 0.01 | 0.03 | 0.04 |

**Darden Renewable Energy Project**
**Construction CalEEMod**
**Tier 4 Construction Fleet - 18-Month**

Ph6: Hydrogen / 2nd Site Prep (2026) [3.5]

| | TOG | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/year | | | | | | | | | | |
| Off-Road | 0.58 | 0.58 | 5.97 | 31.3 | 0.05 | 0.1 | | 0.1 | 0.1 | | 0.1 |
| Dust | | | | | | | 2.05 | 2.05 | | 1.01 | 1.01 |
| On-site Truck | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Worker | 0.05 | 0.05 | 0.03 | 0.38 | 0 | 0 | 0.07 | 0.07 | 0 | 0.02 | 0.02 |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hauling 160 mi | 0.08 | 0.03 | 2.61 | 0.45 | 0.03 | 0.05 | 0.64 | 0.69 | 0.05 | 0.19 | 0.21 |
| **Total** | **0.71** | **0.656666667** | **8.613333333** | **32.13333333** | **0.076666667** | **0.153333333** | **2.76** | **2.913333333** | **0.153333333** | **1.216666667** | **1.343333333** |
| Hauling 60 mi | 0.03 | 0.01 | 0.98 | 0.17 | 0.01 | 0.02 | 0.24 | 0.26 | 0.02 | 0.07 | 0.08 |

Ph6: Hydrogen / 2nd Site Prep (2027) [3.9]

| | TOG | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/year | | | | | | | | | | |
| Off-Road | 0.6 | 0.6 | 6.22 | 32.6 | 0.05 | 0.11 | | 0.11 | 0.11 | | 0.11 |
| Dust | | | | | | | 2.14 | 2.14 | | 1.06 | 1.06 |
| On-site Truck | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Worker | 0.05 | 0.05 | 0.03 | 0.37 | 0 | 0 | 0.08 | 0.08 | 0 | 0.02 | 0.02 |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hauling 160 mi | 0.08 | 0.03 | 2.67 | 0.45 | 0.03 | 0.05 | 0.67 | 0.72 | 0.05 | 0.19 | 0.24 |
| **Total** | **0.73** | **0.676666667** | **8.916666667** | **33.42333333** | **0.076666667** | **0.163333333** | **2.886666667** | **3.05** | **0.163333333** | **1.266666667** | **1.43** |
| Hauling 60 mi | 0.03 | 0.01 | 1 | 0.17 | 0.01 | 0.02 | 0.25 | 0.27 | 0.02 | 0.07 | 0.09 |

**Darden Renewable Energy Project**
**Construction CalEEMod**
**Tier 4 Construction Fleet - 18-Month**

Ph7: Utility Switchyard / 3rd Site Prep (2026) [3.9]

| Category | TOG | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | tons/year | | | | | | | | | | |
| Off-Road | 0.79 | 0.76 | 8.82 | 31.2 | 0.06 | 0.16 | | 0.16 | 0.15 | | 0.15 |
| Dust | | | | | | | 1.62 | 1.62 | | 0.8 | 0.8 |
| On-Site Truck | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Worker | 0.06 | 0.05 | 0.03 | 0.41 | 0 | 0 | 0.08 | 0.08 | 0 | 0.02 | 0.02 |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hauling 160 mi | 0.03 | 0.01 | 0.91 | 0.16 | 0.01 | 0.03 | 0.21 | 0.24 | 0.03 | 0.05 | 0.08 |
| **Total** | **0.876666667** | **0.823333333** | **9.756666667** | **31.77** | **0.073333333** | **0.186666667** | **1.913333333** | **2.1** | **0.176666667** | **0.873333333** | **1.05** |
| Hauling 60 mi | 0.01 | 0.005 | 0.34 | 0.06 | 0.005 | 0.01 | 0.08 | 0.09 | 0.01 | 0.02 | 0.03 |

**Darden Renewable Energy Project**
**Construction CalEEMod**
**Tier 4 Construction Fleet - 18-Month**

Max Daily

| | TOG | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lbs/day | | | | | | | | | | |
| Daily - Summer (Max) | | | | | | | | | | | |
| 2026 | 86.5 | 79.3 | 855 | 2924 | 4.88 | 21.8 | 180 | 201 | 20.6 | 83.5 | 104 |
| 2027 | 52.5 | 51.4 | 587 | 2379 | 3.96 | 8.17 | 129 | 137 | 8.17 | 57.1 | 65.3 |
| Daily - Winter (Max) | | | | | | | | | | | |
| 2025 | 43.1 | 37.6 | 389 | 637 | 1.07 | 14.5 | 103 | 117 | 13.5 | 50 | 63.5 |
| 2026 | 85.1 | 78.3 | 857 | 3175 | 5.34 | 21.8 | 180 | 201 | 20.6 | 83.5 | 104 |
| 2027 | 61.6 | 59.8 | 708 | 2817 | 4.71 | 9.71 | 135 | 145 | 9.71 | 58.5 | 68.3 |
| Max by Year | | | | | | | | | | | |
| 2025 | 43 | 38 | 389 | 637 | 1 | 15 | 103 | 117 | 14 | 50 | 64 |
| 2026 | 87 | 79 | 857 | 3175 | 5 | 22 | 180 | 201 | 21 | 84 | 104 |
| 2027 | 62 | 60 | 708 | 2817 | 5 | 10 | 135 | 145 | 10 | 59 | 68 |
| Max Daily | 87 | 79 | 857 | 3175 | 5 | 22 | 180 | 201 | 21 | 84 | 104 |
| Screening Level | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Exceed? | No | No | Yes | Yes | No | No | Yes | Yes | No | No | Yes |

| |
|---|
| 21.2 |
| 29.9 |
| 8.94 |
| 49.4 |
| 109.44 |
| 27.36 |
| 82.08 |

# Darden Renewable Energy Project
# Construction CalEEMod
# Tier 4 Construction Fleet - 18-Month

**Ph1: Site Prep / Grading (2025) [3.11]**

| | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | tons/year | | | | | | | | | |
| **CalEEMod** | **0.028333333** | **0.158333333** | **0.238333333** | **0.013333333** | **0.023333333** | **0.058333333** | **0.068333333** | **0.013333333** | **0.038333333** | **0.038333333** |
| **UTV** | **8.03E-06** | **7.18E-03** | **1.84E-01** | **2.45E-08** | **0.00E+00** | **0.00E+00** | **6.65E-08** | **0.00E+00** | **0.00E+00** | **1.94E-07** |
| **2025 TOTAL** | **0.028341358** | **0.16550938** | **0.42251853** | **0.013333358** | **0.023333333** | **0.058333333** | **0.0683334** | **0.013333333** | **0.038333333** | **0.038333528** |

**Ph1: Site Prep / Grading (2026) [3.13]**

| | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | tons/year | | | | | | | | | |
| **CalEEMod** | **1.823333333** | **19.01333333** | **31.25333333** | **0.063333333** | **0.733333333** | **4.64** | **5.386666667** | **0.683333333** | **2.246666667** | **2.916666667** |
| **UTV** | **7.14E-04** | **4.12E-03** | **1.06E-01** | **2.18E-06** | **0.00E+00** | **0.00E+00** | **5.92E-06** | **0.00E+00** | **0.00E+00** | **1.73E-05** |
| **2026 TOTAL** | **1.824047558** | **19.01745377** | **31.35909129** | **0.063335509** | **0.733333333** | **4.64** | **5.386672587** | **0.683333333** | **2.246666667** | **2.916683955** |

**Ph1: Site Prep**

| | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | tons/year | | | | | | | | | |
| **2025** | **0.03** | **0.17** | **0.42** | **0.01** | **0.02** | **0.06** | **0.07** | **0.01** | **0.04** | **0.04** |
| **2026** | **1.82** | **19.02** | **31.36** | **0.06** | **0.73** | **4.64** | **5.39** | **0.68** | **2.25** | **2.92** |

# Darden Renewable Energy Project
# Construction CalEEMod
# Tier 4 Construction Fleet - 18-Month

**Ph2: PV Panel System / 1st Site Prep (2026) [3.1]**

| | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | tons/year | | | | | | | | | |
| **CalEEMod** | **2.913333333** | **32.10666667** | **128.11** | **0.203333333** | **0.416666667** | **6.053333333** | **6.47** | **0.416666667** | **2.593333333** | **3.01** |
| **UTV** | **3.59E-02** | **1.48E-01** | **3.79E+00** | **1.09E-04** | **0.00E+00** | **0.00E+00** | **2.97E-04** | **0.00E+00** | **0.00E+00** | **8.68E-04** |
| **2026 TOTAL** | **2.949185823** | **32.25440725** | **131.9020082** | **0.203442566** | **0.416666667** | **6.053333333** | **6.470297207** | **0.416666667** | **2.593333333** | **3.010867831** |

**Ph2: PV Panel System / 1st Site Prep (2027) [3.3]**

| | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | tons/year | | | | | | | | | |
| **CalEEMod** | **1.323333333** | **14.67** | **58.48** | **0.103333333** | **0.193333333** | **2.786666667** | **2.966666667** | **0.193333333** | **1.196666667** | **1.376666667** |
| **UTV** | **1.65E-02** | **6.81E-02** | **1.75E+00** | **5.04E-05** | **0.00E+00** | **0.00E+00** | **1.37E-04** | **0.00E+00** | **0.00E+00** | **4.00E-04** |
| **2027 TOTAL** | **1.339868043** | **14.73813607** | **60.22882571** | **0.10338371** | **0.193333333** | **2.786666667** | **2.966803735** | **0.193333333** | **1.196666667** | **1.377066899** |

**0**

| | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | tons/year | | | | | | | | | |
| **CalEEMod** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** |
| **UTV** | | | | | | | | | | |
| **2028 TOTAL** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** |

# Darden Renewable Energy Project
# Construction CalEEMod
# Tier 4 Construction Fleet - 18-Month

**Ph2: PV Panel System**

| | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | tons/year | | | | | | | | | |
| **2026** | **2.95** | **32.25** | **131.90** | **0.20** | **0.42** | **6.05** | **6.47** | **0.42** | **2.59** | **3.01** |
| **2027** | **1.34** | **14.74** | **60.23** | **0.10** | **0.19** | **2.79** | **2.97** | **0.19** | **1.20** | **1.38** |
| **2028** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** |

**Ph3: Inverters, etc / 1st Building Construction (2026) [3.15]**

| | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | tons/year | | | | | | | | | |
| CalEEMod | 0.796666667 | 10.50666667 | 35.48333333 | 0.063333333 | 0.136666667 | 0.763333333 | 0.926666667 | 0.136666667 | 0.21 | 0.346666667 |
| UTV | 7.26E-03 | 2.99E-02 | 7.68E-01 | 2.21E-05 | 0.00E+00 | 0.00E+00 | 6.02E-05 | 0.00E+00 | 0.00E+00 | 1.76E-04 |
| Helicopter | 0.252 | 2.30292 | 1.79892 | 0.17226 | 0 | 0.28026 | 0.28026 | 0 | 0.27774 | 0.27774 |
| **2026 TOTAL** | **1.055927687** | **12.8395078** | **38.05022921** | **0.235615456** | **0.136666667** | **1.043593333** | **1.206986858** | **0.136666667** | **0.48774** | **0.624582424** |

# Darden Renewable Energy Project
# Construction CalEEMod
# Tier 4 Construction Fleet - 18-Month

**Ph3: Inverters, etc / 1st Building Construction (2027) [3.17]**

| | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | tons/year | | | | | | | | | |
| CalEEMod | 0.233333333 | 2.983333333 | 10.07666667 | 0.033333333 | 0.043333333 | 0.23 | 0.26 | 0.043333333 | 0.073333333 | 0.103333333 |
| UTV | 1.35E-02 | 8.44E-03 | 2.17E-01 | 4.11E-05 | 0.00E+00 | 0.00E+00 | 1.12E-04 | 0.00E+00 | 0.00E+00 | 3.27E-04 |
| **2027 TOTAL** | **0.246831383** | **2.991772629** | **10.29327525** | **0.033374458** | **0.043333333** | **0.23** | **0.260111895** | **0.043333333** | **0.073333333** | **0.103660062** |

**Ph3: Inverters, etc**

| | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | tons/year | | | | | | | | | |
| **2626** | **1.06** | **12.84** | **38.05** | **0.24** | **0.14** | **1.04** | **1.21** | **0.14** | **0.49** | **0.62** |
| **2027** | **0.25** | **2.99** | **10.29** | **0.03** | **0.04** | **0.23** | **0.26** | **0.04** | **0.07** | **0.10** |

**Ph4: Gen-tie**

| | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | tons/year | | | | | | | | | |
| CalEEMod | 0.133333333 | 2.833333333 | 3.963333333 | 0.023333333 | 0.036666667 | 0.263333333 | 0.3 | 0.036666667 | 0.063333333 | 0.1 |
| UTV | 4.82E-04 | 1.98E-03 | 5.09E-02 | 1.47E-06 | 0.00E+00 | 0.00E+00 | 3.99E-06 | 0.00E+00 | 0.00E+00 | 1.17E-05 |
| Helicopter | 1.008 | 9.21168 | 7.19568 | 0.68904 | 0 | 1.12104 | 1.12104 | 0 | 1.11096 | 1.11096 |
| **2026 TOTAL** | **1.14** | **12.05** | **11.21** | **0.71** | **0.04** | **1.38** | **1.42** | **0.04** | **1.17** | **1.21** |

# Darden Renewable Energy Project
## Construction CalEEMod
## Tier 4 Construction Fleet - 18-Month

**Ph5: Battery Storage / 3rd Building Construction (2026) [3.21]**

| | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | tons/year | | | | | | | | | |
| CalEEMod | 0.153333333 | 2.82 | 6.35 | 0.023333333 | 0.046666667 | 0.253333333 | 0.3 | 0.046666667 | 0.063333333 | 0.11 |
| UTV | 2.17E-04 | 8.93E-04 | 2.29E-02 | 6.60E-07 | 0.00E+00 | 0.00E+00 | 1.80E-06 | 0.00E+00 | 0.00E+00 | 5.24E-06 |
| 2026 TOTAL | 0.153550008 | 2.820892872 | 6.372917052 | 0.023333993 | 0.046666667 | 0.253333333 | 0.300001796 | 0.046666667 | 0.063333333 | 0.110005245 |

**Ph5: Battery Storage / 3rd Building Construction (2027) [3.23]**

| | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | tons/year | | | | | | | | | |
| CalEEMod | 0.223333333 | 4.393333333 | 9.993333333 | 0.023333333 | 0.056666667 | 0.406666667 | 0.463333333 | 0.056666667 | 0.09 | 0.146666667 |
| UTV | 2.93E-04 | 1.21E-03 | 3.10E-02 | 8.92E-07 | 0.00E+00 | 0.00E+00 | 2.43E-06 | 0.00E+00 | 0.00E+00 | 7.09E-06 |
| 2027 TOTAL | 0.223626246 | 4.394540364 | 10.02431379 | 0.023334226 | 0.056666667 | 0.406666667 | 0.463335761 | 0.056666667 | 0.09 | 0.146673757 |

**Ph5: Battery Storage**

| | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | tons/year | | | | | | | | | |
| 2026 | 0.15 | 2.82 | 6.37 | 0.02 | 0.05 | 0.25 | 0.30 | 0.05 | 0.06 | 0.11 |
| 2027 | 0.22 | 4.39 | 10.02 | 0.02 | 0.06 | 0.41 | 0.46 | 0.06 | 0.09 | 0.15 |

# Darden Renewable Energy Project
## Construction CalEEMod
## Tier 4 Construction Fleet - 18-Month

**Ph6: Hydrogen / 2nd Site Prep (2026) [3.5]**

| | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | tons/year | | | | | | | | | |
| CalEEMod | 0.656666667 | 8.613333333 | 32.13333333 | 0.076666667 | 0.153333333 | 2.76 | 2.913333333 | 0.153333333 | 1.216666667 | 1.343333333 |
| UTV | 1.61E-03 | 0.006613868 | 0.169755942 | 4.89E-06 | | | 1.33E-05 | | | 3.89E-05 |
| 2026 TOTAL | 0.658271667 | 8.619947201 | 32.30308928 | 0.076671557 | 0.153333333 | 2.76 | 2.913346638 | 0.153333333 | 1.216666667 | 1.343372183 |

**Ph6: Hydrogen / 2nd Site Prep (2027) [3.9]**

| | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | tons/year | | | | | | | | | |
| CalEEMod | 0.676666667 | 8.916666667 | 33.42333333 | 0.076666667 | 0.163333333 | 2.886666667 | 3.05 | 0.163333333 | 1.266666667 | 1.43 |
| UTV | 0.00E+00 | 0 | 0 | 0.00E+00 | | | 0.00E+00 | | | 0.00E+00 |
| 2027 TOTAL | 0.676666667 | 8.916666667 | 33.42333333 | 0.076666667 | 0.163333333 | 2.886666667 | 3.05 | 0.163333333 | 1.266666667 | 1.43 |

**Ph6: Hydrogen**

| | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | tons/year | | | | | | | | | |
| 2026 | 0.66 | 8.62 | 32.30 | 0.08 | 0.15 | 2.76 | 2.91 | 0.15 | 1.22 | 1.34 |
| 2027 | 0.68 | 8.92 | 33.42 | 0.08 | 0.16 | 2.89 | 3.05 | 0.16 | 1.27 | 1.43 |

# Darden Renewable Energy Project
# Construction CalEEMod
# Tier 4 Construction Fleet - 18-Month

**Ph7: Utility Switchyard**

| | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | tons/year | | | | | | | | | |
| **2026** | **0.82** | **9.76** | **31.77** | **0.07** | **0.19** | **1.91** | **2.10** | **0.18** | **0.87** | **1.05** |
| | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** |

## Darden Renewable Energy Project
## ATV Emissions Calculations - 18-Month

### ***Assumptions***

| ATV/UTV | HP | |
|---|---|---|
| Honda Pioneer 700 | 36.1 | |
| Polaris XP 1000 | 82 | 0 |
| Kawaski Mule Pro-FXT | 47 | |
| Polaris Ranger 500 | 32 | |
| #VALUE! | 82 | |
| CAN-AM DEFENDER MAX HD10 LONE STAR | 82 | |
| Honda Pioneer 700 | 72 | |
| POLARIS GENERAL XP 4 1000 DELUXE | 100 | |
| POLARIS RANGER CREW XP 1000 PREMIUM | 82 | |
| YAMAHA VIKING VI EPS RANCH EDITION | N/A | |

Note: Top 10 UTVs of 2022

| ***Ph1: Site Prep (2025)*** | | |
|---|---|---|
| HP assumed for analysis | 100 | |
| # UTVs | 14 | |
| Hrs of Operation | 5 | |
| Total UTV hours of operation per day | 70 | |
| days per year | 1 | 12/31/2025 |
| Total UTV Hours of operation per year | 70 | |

**Darden Renewable Energy Project**
**ATV Emissions Calculations - 18-Month**

***Emissions Calculations***

g/hpH[1]

| | |
|---|---|
| NOx | 0.6 |
| CO | 15.4 |

Emissions

| | g/HPh | hpH/day | g/day | lbs/gr | lbs/day | days/yr | lbs/year |
|---|---|---|---|---|---|---|---|
| NOx | 0.6 | 70 | 42 | 0.002205 | 0.092594 | 155 | 14.35209 |
| CO | 15.4 | 70 | 1078 | 0.002205 | 2.376583 | 155 | 368.3704 |
| CO2e | | | | | | | |

| | lbs/year | tons/lb | tons/yr |
|---|---|---|---|
| NOx | 14.35209 | 0.0005 | 0.007176 |
| CO | 368.3704 | 0.0005 | 0.184185 |

1 CARB 2022. Off-Highway Recreational Vehicle Emissions Certification Requirements. https://ww2.arb.ca.gov/highway-recreational-vehicle-emissions-certification-requirements

| | |
|---|---|
| 15 | miles per hour |
| 50 | hours per day |
| 750 | miles per hour |
| 10 | miles per gallon |
| 75 | gallons per day |

| emissions per gallon | ROG | SOx | PM10 | PM2.5 | CO2 | MT CO2e |
|---|---|---|---|---|---|---|
| tons/gallon | 1.07E-07 | 3.26E-10 | 8.87E-10 | 2.59E-09 | 2.42E-05 | |
| tons/day | 8.03E-06 | 2.45E-08 | 6.65E-08 | 1.94E-07 | 1.82E-03 | |
| tons/year | 8.03E-06 | 2.45E-08 | 6.65E-08 | 1.94E-07 | 1.82E-03 | 1.65E-03 |
| lbs/day | 1.61E-02 | 4.89E-05 | 1.33E-04 | 3.89E-04 | 3.63E+00 | |

**Darden Renewable Energy Project**
**ATV Emissions Calculations - 18-Month**

| ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|
| 8.03E-06 | 0.007176047 | 1.84E-01 | 2.45E-08 | | | 6.65E-08 | | | 1.94E-07 |

| ***Ph1: Site Prep (2026)*** | | |
|---|---|---|
| HP assumed for analysis | 8.03E-06 | |
| # UTVs | 14 | |
| Hrs of Operation | 5 | |
| Total UTV hours of operation per day | 70 | |
| days per year | 89 | 1/1/2026 to 5/5/2026 |
| Total UTV Hours of operation per year | 6230 | |

g/hpH[1]

| | |
|---|---|
| NOx | 0.6 |
| CO | 15.4 |

Emissions

| | **g/HPh** | **hpH/day** | **g/day** | **lbs/gr** | **lbs/day** | **days/yr** | **lbs/year** |
|---|---|---|---|---|---|---|---|
| NOx | 0.6 | 70 | 42 | 0.002205 | 0.092594 | 89 | 8.240879 |
| CO | 15.4 | 70 | 1078 | 0.002205 | 2.376583 | 89 | 211.5159 |
| CO2e | | | | | | | |

| | **lbs/year** | **tons/lb** | **tons/yr** |
|---|---|---|---|
| NOx | 8.240879 | 0.0005 | 0.00412 |
| CO | 211.5159 | 0.0005 | 0.105758 |

**Darden Renewable Energy Project**
**ATV Emissions Calculations - 18-Month**

| | |
|---|---|
| 15 | miles per hour |
| 50 | hours per day |
| 750 | miles per hour |
| 10 | miles per gallon |
| 75 | gallons per day |

| emissions per gallon | ROG | SOx | PM10 | PM2.5 | CO2 | MT CO2e |
|---|---|---|---|---|---|---|
| tons/gallon | 1.07E-07 | 3.26E-10 | 8.87E-10 | 2.59E-09 | 2.42E-05 | |
| tons/day | 8.03E-06 | 2.45E-08 | 6.65E-08 | 1.94E-07 | 1.82E-03 | |
| tons/year | 7.14E-04 | 2.18E-06 | 5.92E-06 | 1.73E-05 | 1.62E-01 | 1.47E-01 |
| lbs/day | 1.61E-02 | 4.89E-05 | 1.33E-04 | 3.89E-04 | 3.63E+00 | |

| ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|
| 7.14E-04 | 0.00412044 | 1.06E-01 | 2.18E-06 | | | 5.92E-06 | | | 1.73E-05 |

**Darden Renewable Energy Project**
**ATV Emissions Calculations - 18-Month**

| ***Ph2: PV Panel System (2026)*** | | |
|---|---|---|
| HP assumed for analysis | 100 | |
| # UTVs | 204 | |
| Hrs of Operation | 5 | |
| Total UTV hours of operation per day | 1020 | |
| days per year | 219 | 2-28/2026 to 12/31/2026 |
| Total UTV Hours of operation per year | 223380 | |

***Emissions Calculations***

| g/hpH[1] | |
|---|---|
| NOx | 0.6 |
| CO | 15.4 |

| Emissions | **g/HPh** | **hpH/day** | **g/day** | **lbs/gr** | **lbs/day** | **days/yr** | **lbs/year** |
|---|---|---|---|---|---|---|---|
| NOx | 0.6 | 1020 | 612 | 0.002205 | 1.349229 | 219 | 295.4812 |
| CO | 15.4 | 1020 | 15708 | 0.002205 | 34.63021 | 219 | 7584.016 |
| CO2e | | | | | | | |

| | **lbs/year** | **tons/lb** | **tons/yr** |
|---|---|---|---|
| NOx | 295.4812 | 0.0005 | 0.147741 |
| CO | 7584.016 | 0.0005 | 3.792008 |

| | |
|---|---|
| 15 | miles per hour |
| 1020 | hours per day |
| 15300 | miles per hour |
| 10 | miles per gallon |
| 1530 | gallons per day |

**Darden Renewable Energy Project**
**ATV Emissions Calculations - 18-Month**

***Ph2: PV Panel System (2026)***

| emissions per gallon | ROG | SOx | PM10 | PM2.5 | CO2 | MT CO2e |
|---|---|---|---|---|---|---|
| tons/gallon | 1.07E-07 | 3.26E-10 | 8.87E-10 | 2.59E-09 | 2.42E-05 | |
| tons/day | 1.64E-04 | 4.99E-07 | 1.36E-06 | 3.96E-06 | 3.70E-02 | |
| tons/year | 3.59E-02 | 1.09E-04 | 2.97E-04 | 8.68E-04 | 8.11E+00 | 7.36E+00 |
| lbs/day | 3.27E-01 | 9.98E-04 | 2.71E-03 | 7.93E-03 | 7.41E+01 | |

| ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|
| 3.59E-02 | 0.14774058 | 3.79E+00 | 1.09E-04 | | | 2.97E-04 | | | 8.68E-04 |

***Ph2: PV Panel System (2027)***

| | | |
|---|---|---|
| HP assumed for analysis | 100 | |
| # UTVs | 204 | |
| Hrs of Operation | 5 | |
| Total UTV hours of operation per day | 1020 | |
| days per year | 101 | 1/1/2027 to 5/21/2027 |
| Total UTV Hours of operation per year | 103020 | |

***<u>Emissions Calculations</u>***

| g/hpH[1] | |
|---|---|
| NOx | 0.6 |
| CO | 15.4 |

| Emissions | **g/HPh** | **hpH/day** | **g/day** | **lbs/gr** | **lbs/day** | **days/yr** | **lbs/year** |
|---|---|---|---|---|---|---|---|
| NOx | 0.6 | 1020 | 612 | 0.002205 | 1.349229 | 101 | 136.2721 |
| CO | 15.4 | 1020 | 15708 | 0.002205 | 34.63021 | 101 | 3497.651 |
| CO2e | | | | | | | |

| | **lbs/year** | **tons/lb** | **tons/yr** |
|---|---|---|---|
| NOx | 136.2721 | 0.0005 | 0.068136 |
| CO | 3497.651 | 0.0005 | 1.748826 |

**Darden Renewable Energy Project**
**ATV Emissions Calculations - 18-Month**

***Ph2: PV Panel System (2026)***

| | |
|---|---|
| 15 | miles per hour |
| 1020 | hours per day |
| 15300 | miles per hour |
| 10 | miles per gallon |
| 1530 | gallons per day |

| emissions per gallon | ROG | SOx | PM10 | PM2.5 | CO2 | MT CO2e |
|---|---|---|---|---|---|---|
| tons/gallon | 1.07E-07 | 3.26E-10 | 8.87E-10 | 2.59E-09 | 2.42E-05 | |
| tons/day | 1.64E-04 | 4.99E-07 | 1.36E-06 | 3.96E-06 | 3.70E-02 | |
| tons/year | 1.65E-02 | 5.04E-05 | 1.37E-04 | 4.00E-04 | 3.74E+00 | 3.39E+00 |
| lbs/day | 3.27E-01 | 9.98E-04 | 2.71E-03 | 7.93E-03 | 7.41E+01 | |

| ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|
| 1.65E-02 | 0.068136067 | 1.75E+00 | 5.04E-05 | | | 1.37E-04 | | | 4.00E-04 |

**Darden Renewable Energy Project**
**ATV Emissions Calculations - 18-Month**

| ***Ph3: Inverters, Transformers, Substation, Electrical (2026)*** | | |
|---|---|---|
| HP assumed for analysis | 100 | |
| # UTVs | 58 | |
| Hrs of Operation | 5 | |
| Total UTV hours of operation per day | 290 | |
| days per year | 156 | 5/8/2026 to 12/31/2026 |
| Total UTV Hours of operation per year | 45240 | |

***Emissions Calculations***

| g/hpH[1] | |
|---|---|
| NOx | 0.6 |
| CO | 15.4 |

| Emissions | **g/HPh** | **hpH/day** | **g/day** | **lbs/gr** | **lbs/day** | **days/yr** | **lbs/year** |
|---|---|---|---|---|---|---|---|
| NOx | 0.6 | 290 | 174 | 0.002205 | 0.383604 | 156 | 59.84228 |
| CO | 15.4 | 290 | 4466 | 0.002205 | 9.845845 | 156 | 1535.952 |
| CO2e | | | | | | | |

| | **lbs/year** | **tons/lb** | **tons/yr** |
|---|---|---|---|
| NOx | 59.84228 | 0.0005 | 0.029921 |
| CO | 1535.952 | 0.0005 | 0.767976 |

| | |
|---|---|
| 15 | miles per hour |
| 290 | hours per day |
| 4350 | miles per hour |
| 10 | miles per gallon |
| 435 | gallons per day |

**Darden Renewable Energy Project**
**ATV Emissions Calculations - 18-Month**

***Ph3: Inverters, Transformers, Substation, Electrical (2026)***

| emissions per gallon | ROG | SOx | PM10 | PM2.5 | CO2 | MT CO2e |
|---|---|---|---|---|---|---|
| tons/gallon | 1.07E-07 | 3.26E-10 | 8.87E-10 | 2.59E-09 | 2.42E-05 | |
| tons/day | 4.65E-05 | 1.42E-07 | 3.86E-07 | 1.13E-06 | 1.05E-02 | |
| tons/year | 7.26E-03 | 2.21E-05 | 6.02E-05 | 1.76E-04 | 1.64E+00 | 1.49E+00 |
| lbs/day | 9.31E-02 | 2.84E-04 | 7.72E-04 | 2.25E-03 | 2.11E+01 | |

| ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|
| 7.26E-03 | 0.029921138 | 7.68E-01 | 2.21E-05 | | | 6.02E-05 | | | 1.76E-04 |

***Ph3: Inverters, Transformers, Substation, Electrical (2027)***

| | | |
|---|---|---|
| HP assumed for analysis | 100 | |
| # UTVs | 58 | |
| Hrs of Operation | 5 | |
| Total UTV hours of operation per day | 290 | |
| days per year | 44 | 1/1/2027 to 3/3/2027 |
| Total UTV Hours of operation per year | 12760 | |

***Emissions Calculations***

| g/hpH[1] | |
|---|---|
| NOx | 0.6 |
| CO | 15.4 |

| Emissions | **g/HPh** | **hpH/day** | **g/day** | **lbs/gr** | **lbs/day** | **days/yr** | **lbs/year** |
|---|---|---|---|---|---|---|---|
| NOx | 0.6 | 290 | 174 | 0.002205 | 0.383604 | 44 | 16.87859 |
| CO | 15.4 | 290 | 4466 | 0.002205 | 9.845845 | 44 | 433.2172 |
| CO2e | | | | | | | |

| | **lbs/year** | **tons/lb** | **tons/yr** |
|---|---|---|---|
| NOx | 16.87859 | 0.0005 | 0.008439 |
| CO | 433.2172 | 0.0005 | 0.216609 |

**Darden Renewable Energy Project**
**ATV Emissions Calculations - 18-Month**

***Ph3: Inverters, Transformers, Substation, Electrical (2026)***

| | |
|---|---|
| 15 | miles per hour |
| 290 | hours per day |
| 4350 | miles per hour |
| 10 | miles per gallon |
| 435 | gallons per day |

| emissions per gallon | ROG | SOx | PM10 | PM2.5 | CO2 | MT CO2e |
|---|---|---|---|---|---|---|
| tons/gallon | 1.07E-07 | 3.26E-10 | 8.87E-10 | 2.59E-09 | 2.42E-05 | |
| tons/day | 4.65E-05 | 1.42E-07 | 3.86E-07 | 1.13E-06 | 1.05E-02 | |
| tons/year | 1.35E-02 | 4.11E-05 | 1.12E-04 | 3.27E-04 | 3.05E+00 | 2.77E+00 |
| lbs/day | 9.31E-02 | 2.84E-04 | 7.72E-04 | 2.25E-03 | 2.11E+01 | |

| ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|
| 1.35E-02 | 0.008439295 | 2.17E-01 | 4.11E-05 | | | 1.12E-04 | | | 3.27E-04 |

**Darden Renewable Energy Project**
**ATV Emissions Calculations - 18-Month**

| | | |
|---|---|---|
| ***Ph4: Gen-tie (2027)*** | | |
| HP assumed for analysis | 100 | |
| # UTVs | 6 | |
| Hrs of Operation | 5 | |
| Total UTV hours of operation per day | 30 | |
| days per year | 100 | 1/30/2026 to 6/18/2026 |
| Total UTV Hours of operation per year | 3000 | |

***Emissions Calculations***

| g/hpH[1] | |
|---|---|
| NOx | 0.6 |
| CO | 15.4 |

| Emissions | **g/HPh** | **hpH/day** | **g/day** | **lbs/gr** | **lbs/day** | **days/yr** | **lbs/year** |
|---|---|---|---|---|---|---|---|
| NOx | 0.6 | 30 | 18 | 0.002205 | 0.039683 | 100 | 3.968321 |
| CO | 15.4 | 30 | 462 | 0.002205 | 1.018536 | 100 | 101.8536 |
| CO2e | | | | | | | |

| | **lbs/year** | **tons/lb** | **tons/yr** |
|---|---|---|---|
| NOx | 3.968321 | 0.0005 | 0.001984 |
| CO | 101.8536 | 0.0005 | 0.050927 |

| | |
|---|---|
| 15 | miles per hour |
| 30 | hours per day |
| 450 | miles per hour |
| 10 | miles per gallon |
| 45 | gallons per day |

**Darden Renewable Energy Project**
**ATV Emissions Calculations - 18-Month**

***Ph4: Gen-tie (2027)***

| emissions per gallon | ROG | SOx | PM10 | PM2.5 | CO2 | MT CO2e |
|---|---|---|---|---|---|---|
| tons/gallon | 1.07E-07 | 3.26E-10 | 8.87E-10 | 2.59E-09 | 2.42E-05 | |
| tons/day | 4.82E-06 | 1.47E-08 | 3.99E-08 | 1.17E-07 | 1.09E-03 | |
| tons/year | 4.82E-04 | 1.47E-06 | 3.99E-06 | 1.17E-05 | 1.09E-01 | 9.88E-02 |
| lbs/day | 9.63E-03 | 2.93E-05 | 7.98E-05 | 2.33E-04 | 2.18E+00 | |

| ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|
| 4.82E-04 | 0.00198416 | 5.09E-02 | 1.47E-06 | | | 3.99E-06 | | | 1.17E-05 |

**Darden Renewable Energy Project**
**ATV Emissions Calculations - 18-Month**

| ***Ph5: Battery Storage (2026)*** | | |
|---|---|---|
| HP assumed for analysis | 100 | |
| # UTVs | 6 | |
| Hrs of Operation | 5 | |
| Total UTV hours of operation per day | 30 | |
| days per year | 45 | 10/28/2026 to 12/31/2026 |
| Total UTV Hours of operation per year | 1350 | |

***Emissions Calculations***

| g/hpH[1] | |
|---|---|
| NOx | 0.6 |
| CO | 15.4 |

| Emissions | **g/HPh** | **hpH/day** | **g/day** | **lbs/gr** | **lbs/day** | **days/yr** | **lbs/year** |
|---|---|---|---|---|---|---|---|
| NOx | 0.6 | 30 | 18 | 0.002205 | 0.039683 | 45 | 1.785744 |
| CO | 15.4 | 30 | 462 | 0.002205 | 1.018536 | 45 | 45.8341 |
| CO2e | | | | | | | |

| | **lbs/year** | **tons/lb** | **tons/yr** |
|---|---|---|---|
| NOx | 1.785744 | 0.0005 | 0.000893 |
| CO | 45.8341 | 0.0005 | 0.022917 |

| | |
|---|---|
| 15 | miles per hour |
| 30 | hours per day |
| 450 | miles per hour |
| 10 | miles per gallon |
| 45 | gallons per day |

**Darden Renewable Energy Project**
**ATV Emissions Calculations - 18-Month**

***Ph5: Battery Storage (2026)***

| | ROG | SOx | PM10 | PM2.5 | CO2 | MT CO2e |
|---|---|---|---|---|---|---|
| emissions per gallon | | | | | | |
| tons/gallon | 1.07E-07 | 3.26E-10 | 8.87E-10 | 2.59E-09 | 2.42E-05 | |
| tons/day | 4.82E-06 | 1.47E-08 | 3.99E-08 | 1.17E-07 | 1.09E-03 | |
| tons/year | 2.17E-04 | 6.60E-07 | 1.80E-06 | 5.24E-06 | 4.90E-02 | 4.45E-02 |
| lbs/day | 9.63E-03 | 2.93E-05 | 7.98E-05 | 2.33E-04 | 2.18E+00 | |

| ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|
| 2.17E-04 | 0.000892872 | 2.29E-02 | 6.60E-07 | | | 1.80E-06 | | | 5.24E-06 |

***Ph5: Battery Storage (2027)***

| | | |
|---|---|---|
| HP assumed for analysis | 100 | |
| # UTVs | 5 | |
| Hrs of Operation | 5 | |
| Total UTV hours of operation per day | 25 | |
| days per year | 73 | 1/1/2027 to 4/13/2027 |
| Total UTV Hours of operation per year | 1825 | |

***Emissions Calculations***

| g/hpH[1] | |
|---|---|
| NOx | 0.6 |
| CO | 15.4 |

| Emissions | **g/HPh** | **hpH/day** | **g/day** | **lbs/gr** | **lbs/day** | **days/yr** | **lbs/year** |
|---|---|---|---|---|---|---|---|
| NOx | 0.6 | 25 | 15 | 0.002205 | 0.033069 | 73 | 2.414062 |
| CO | 15.4 | 25 | 385 | 0.002205 | 0.84878 | 73 | 61.96092 |

CO2e

| | **lbs/year** | **tons/lb** | **tons/yr** |
|---|---|---|---|
| NOx | 2.414062 | 0.0005 | 0.001207 |
| CO | 61.96092 | 0.0005 | 0.03098 |

**Darden Renewable Energy Project**
**ATV Emissions Calculations - 18-Month**

***Ph5: Battery Storage (2026)***

| | |
|---|---|
| 15 | miles per hour |
| 25 | hours per day |
| 375 | miles per hour |
| 10 | miles per gallon |
| 37.5 | gallons per day |

| emissions per gallon | ROG | SOx | PM10 | PM2.5 | CO2 | MT CO2e |
|---|---|---|---|---|---|---|
| tons/gallon | 1.07E-07 | 3.26E-10 | 8.87E-10 | 2.59E-09 | 2.42E-05 | |
| tons/day | 4.01E-06 | 1.22E-08 | 3.33E-08 | 9.71E-08 | 9.08E-04 | |
| tons/year | 2.93E-04 | 8.92E-07 | 2.43E-06 | 7.09E-06 | 6.62E-02 | 6.01E-02 |
| lbs/day | 8.03E-03 | 2.45E-05 | 6.65E-05 | 1.94E-04 | 1.82E+00 | |

| ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|
| 2.93E-04 | 0.001207031 | 3.10E-02 | 8.92E-07 | | | 2.43E-06 | | | 7.09E-06 |

**Darden Renewable Energy Project**
**ATV Emissions Calculations - 18-Month**

| ***Ph6: Hydrogen (2028)*** | | |
|---|---|---|
| HP assumed for analysis | 100 | |
| # UTVs | 13 | |
| Hrs of Operation | 5 | |
| Total UTV hours of operation per day | 65 | |
| days per year | 69 | 9/28/2026 to 12/31/2026 |
| Total UTV Hours of operation per year | 4485 | |

***<u>Emissions Calculations</u>***

| | g/hpH[1] |
|---|---|
| NOx | 0.6 |
| CO | 15.4 |

| Emissions | **g/HPh** | **hpH/day** | **g/day** | **lbs/gr** | **lbs/day** | **days/yr** | **lbs/year** |
|---|---|---|---|---|---|---|---|
| NOx | 0.6 | 65 | 39 | 0.002205 | 0.08598 | 69 | 5.932639 |
| CO | 15.4 | 65 | 1001 | 0.002205 | 2.206827 | 69 | 152.2711 |
| CO2e | | | | | | | |

| | **lbs/year** | **tons/lb** | **tons/yr** |
|---|---|---|---|
| NOx | 5.9326395 | 0.0005 | 0.002966 |
| CO | 152.27108 | 0.0005 | 0.076136 |

| | |
|---|---|
| 15 | miles per hour |
| 65 | hours per day |
| 975 | miles per hour |
| 10 | miles per gallon |
| 97.5 | gallons per day |

**Darden Renewable Energy Project**
**ATV Emissions Calculations - 18-Month**

***Ph6: Hydrogen (2028)***

| emissions per gallon | ROG | SOx | PM10 | PM2.5 | CO2 | MT CO2e |
|---|---|---|---|---|---|---|
| tons/gallon | 1.07E-07 | 3.26E-10 | 8.87E-10 | 2.59E-09 | 2.42E-05 | |
| tons/day | 1.04E-05 | 3.18E-08 | 8.65E-08 | 2.53E-07 | 2.36E-03 | |
| tons/year | 7.20E-04 | 2.19E-06 | 5.97E-06 | 1.74E-05 | 1.63E-01 | 1.48E-01 |
| lbs/day | 2.09E-02 | 6.36E-05 | 1.73E-04 | 5.05E-04 | 4.72E+00 | |

| ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|
| 7.20E-04 | 0.00296632 | 7.61E-02 | 2.19E-06 | | | 5.97E-06 | | | 1.74E-05 |

***Ph6: Hydrogen (2029)***

| | | |
|---|---|---|
| HP assumed for analysis | 100 | |
| # UTVs | 10 | |
| Hrs of Operation | 5 | |
| Total UTV hours of operation per day | 50 | |
| days per year | 71 | 1/1/2027 to 4/9/2027 |
| Total UTV Hours of operation per year | 3550 | |

***<u>Emissions Calculations</u>***

g/hpH[1]

| | |
|---|---|
| NOx | 0.6 |
| CO | 15.4 |

| Emissions | g/HPh | hpH/day | g/day | lbs/gr | lbs/day | days/yr | lbs/year |
|---|---|---|---|---|---|---|---|
| NOx | 0.6 | 50 | 30 | 0.002205 | 0.066139 | 71 | 4.695846 |
| CO | 15.4 | 50 | 770 | 0.002205 | 1.697559 | 71 | 120.5267 |
| CO2e | | | | | | | |

| | lbs/year | tons/lb | tons/yr |
|---|---|---|---|
| NOx | 4.6958462 | 0.0005 | 0.002348 |
| CO | 120.52672 | 0.0005 | 0.060263 |

**Darden Renewable Energy Project**
**ATV Emissions Calculations - 18-Month**

***Ph6: Hydrogen (2028)***

| | |
|---|---|
| 15 | miles per hour |
| 50 | hours per day |
| 750 | miles per hour |
| 10 | miles per gallon |
| 75 | gallons per day |

| emissions per gallon | ROG | SOx | PM10 | PM2.5 | CO2 | MT CO2e |
|---|---|---|---|---|---|---|
| tons/gallon | 1.07E-07 | 3.26E-10 | 8.87E-10 | 2.59E-09 | 2.42E-05 | |
| tons/day | 8.03E-06 | 2.45E-08 | 6.65E-08 | 1.94E-07 | 1.82E-03 | |
| tons/year | 5.70E-04 | 1.74E-06 | 4.72E-06 | 1.38E-05 | 1.29E-01 | 1.17E-01 |
| lbs/day | 1.61E-02 | 4.89E-05 | 1.33E-04 | 3.89E-04 | 3.63E+00 | |

| ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|
| 5.70E-04 | 0.002347923 | 6.03E-02 | 1.74E-06 | | | 4.72E-06 | | | 1.38E-05 |

**Helicopter Emissions**

Darden Renewable Energy Project

| Ph 3: Inverters, Transformers, Substation (2028) | 36- & 18- Month | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Helicopter (Qnty: 2) | **ROG** | **NOX** | **CO** | **SO2** | **Fugitive PM10** | **Exhaust PM10** | **PM10 Total** | **Fugitive PM2.5** | **Exhaust PM2.5** | **PM2.5 Total** | **CO2e** |
| lbs/day | 25.20 | 230.29 | 179.89 | 17.23 | 0.00 | 28.03 | 28.03 | 0.00 | 27.77 | 27.77 | 50958.00 |
| lbs/year | 504 | 4605.84 | 3597.84 | 344.52 | 0 | 560.52 | 560.52 | 0 | 555.48 | 555.48 | 1019160 |
| tons/year | 0.252 | 2.30292 | 1.79892 | 0.17226 | 0 | 0.28026 | 0.28026 | 0 | 0.27774 | 0.27774 | 509.58 |
| | | | | | | | | | | | 462.28 MT |

*Notes:*

-Based off of one month of use during construction in 2028, ~20 days

-In 2028, helicopter would operate for one month w/5 working days per week

-Conservatively assumes 9 hours of run time since that is how long other equipment is running for

| Ph 4: Gen-tie (10-15 miles) (2028) | 36 - Month | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Helicopter (Qnty: 3) | **ROG** | **NOX** | **CO** | **SO2** | **Fugitive PM10** | **Exhaust PM10** | **PM10 Total** | **Fugitive PM2.5** | **Exhaust PM2.5** | **PM2.5 Total** | **CO2e** |
| lbs/day | 37.80 | 345.44 | 269.84 | 25.84 | 0.00 | 42.04 | 42.04 | 0.00 | 41.66 | 41.66 | 76437.00 |
| lbs/year | 1512 | 13817.52 | 10793.52 | 1033.56 | 0 | 1681.56 | 1681.56 | 0 | 1666.44 | 1666.44 | 3057480 |
| tons/year | 0.756 | 6.90876 | 5.39676 | 0.51678 | 0 | 0.84078 | 0.84078 | 0 | 0.83322 | 0.83322 | 1528.74 |
| | | | | | | | | | | | 1,386.85 MT |

*Notes:*

-Based off of 2 months of use during construction in 2028, ~40 days

-Helicopter would operate for 8 weeks working 5 days per week

-Conservatively assumes 9 hours of run time since that is how long other equipment is running for

| Ph 4: Gen-tie (10-15 miles) (2028) | 18- Month | | | | | | | | | | 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Helicopter (Qnty: 4) | **ROG** | **NOX** | **CO** | **SO2** | **Fugitive PM10** | **Exhaust PM10** | **PM10 Total** | **Fugitive PM2.5** | **Exhaust PM2.5** | **PM2.5 Total** | **CO2e** |
| lbs/day | 50.40 | 460.58 | 359.78 | 34.45 | 0.00 | 56.05 | 56.05 | 0.00 | 55.55 | 55.55 | 101916.00 |
| lbs/year | 2016 | 18423.36 | 14391.36 | 1378.08 | 0 | 2242.08 | 2242.08 | 0 | 2221.92 | 2221.92 | 4076640 |
| tons/year | 1.008 | 9.21168 | 7.19568 | 0.68904 | 0 | 1.12104 | 1.12104 | 0 | 1.11096 | 1.11096 | 2038.32 |
| | | | | | | | | | | | 1,849.13 MT |

*Notes:*

-Based off of 2 months of use during construction in 2028, ~40 days

-Helicopter would operate for 8 weeks working 5 days per week

-Conservatively assumes 9 hours of run time since that is how long other equipment is running for

## Helicopter Exhaust Emission Rates

# HELICOPTER EMISSIONS

| Helicopter (T58-GE-5) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Emission Rates (pounds/hour) | | | | | | | |
| HC | CO | NOx | SO2 | Total PM | PM10 | PM2.5 | CO2 |
| 1.400 | 9.994 | 12.794 | 0.957 | 1.595 | 1.557 | 1.543 | 2831.000 |

| Emission Rates (grams/hour) | | | | | | | |
|---|---|---|---|---|---|---|---|
| HC | CO | NOx | SO2 | Total PM | PM10 | PM2.5 | CO2 |
| 635.026 | 4533.178 | 5803.230 | 434.086 | 723.476 | 706.113 | 699.758 | 1284113.290 |

Notes:
Two GE T58-S engines.
50% average power use resulting in 14.77 pounds per minute of fuel flow.
Criteria Pollutant Source - Procedures for Emission Inventory Preparation, Volume IV: Mobile Sources, EPA420-R-92-009, December 1992 (Table 5-7).
CO2 Source - Energy Information Administration, Documentation for Emissions of Greenhouse Gases in the United States 2005, DOE/EIA-0638 (2005), October 2007, Tables 6-1, 6-2, 6-4, and 6-5.

*Notes:*
-Helicopter emissions pulled from the SCE LVRAS project, emission factors were provided by another consultant (not Rincon)
-emissions are obtained by multipling the emission factor (lbs/hr) for each pollutant * # hours of operation/day * # of helicopters to get daily emission
-to get tons lbs/year, emissions are multiplied by the # of days for each construction phase for that year

*Notes:*
-Helicopter emissions pulled from the SCE LVRAS project, emission factors were provided by another consultant (not Rincon)
-emissions are obtained by multipling the emission factor (lbs/hr) for each pollutant * # hours of operation/day * # of helicopters to get daily emission
-to get tons lbs/year, emissions are multiplied by the # of days for each construction phase for that year

## Darden Renewable Energy Project
## 36-Month Construction Summary Tables (Original Analysis)

**Note: The following shows the original results; those that changed are highlighted in yellow. Updated results are shown on page 77 of this PDF.**

**36-Month GHG**

| Phase | | $MTCO_2e$ |
|---|---|---|
| **2025** | | |
| Ph1: Site Prep | | 28 |
| | Total 2025 | 28 |
| **2026** | | |
| Ph1: Site Prep | | 5,431 |
| Ph2: PV Panel System | | 13,978 |
| Ph7: Utility Switchyard | | 5,112 |
| | Total 2026 | 24,521 |
| **2027** | | |
| Ph2: PV Panel System | | 23,543 |
| Ph3: Inverters, etc | | 6,842 |
| Ph4: Gen-tie | | 328 |
| Ph7: Utility Switchyard | | 1,515 |
| | Total 2027 | 32,228 |
| **2028** | | |
| Ph2: PV Panel System | | 7,750 |
| Ph3: Inverters, etc | | 4,232 |
| Ph4: Gen-tie | | 2,753 |
| Ph5: Battery Storage | | 3,987 |
| Ph6: Hydrogen | | 20,810 |
| | Total 2028 | 39,531 |
| **Total 36-Month Construction** | | **96,308** |
| **Amortized 36-Month Construction** | | 2,752 |

**36- Month by Project Phase**

| Phase | | $MTCO_2e$ |
|---|---|---|
| | | |
| PV Solar | | 28 |
| | Total 2025 | 28 |
| **2026** | | |
| PV Solar | | 19,408 |
| Ph7: Utility Switchyard | | 5,112 |
| | Total 2026 | 24,521 |
| **2027** | | |
| PV Solar | | 30,713 |
| Ph7: Utility Switchyard | | 1,515 |
| | Total 2027 | 32,228 |
| **2028** | | |
| PV Solar | | 14,735 |
| Ph5: Battery Storage | | 3,987 |
| Ph6: Hydrogen | | 20,810 |
| | Total 2028 | 39,531 |
| | **Total 36-Month Construction** | 96,308 |
| | **Amortized 36-Month Construction** | 2,752 |

## Darden Renewable Energy Project
## 18-Month Construction Summary Tables (Original Analysis)

**Note: The following shows the original results; those that changed are highlighted in yellow. Updated results are shown on page 79 of this PDF.**

**18- Month** GHG

| Phase | | $MTCO_2e$ |
|---|---|---|
| **2025** | | |
| Ph1: Site Prep | | 42 |
| | Total 2025 | 42 |
| **2026** | | |
| Ph1: Site Prep | | 5,209 |
| Ph2: PV Panel System | | 21,067 |
| Ph3: Inverters, etc | | 8,274 |
| Ph4: Gen-tie | | 3,536 |
| Ph5: Battery Storage | | 2,031 |
| Ph6: Hydrogen | | 8,672 |
| | Total 2026 | 48,789 |
| **2027** | | |
| Ph2: PV Panel System | | 9,649 |
| Ph3: Inverters, etc | | 2,795 |
| Ph5: Battery Storage | | 3,172 |
| Ph6: Hydrogen | | 8,944 |
| Ph7: Utility Switchyard | | 6,665 |
| | Total 2027 | 31,225 |
| **Total 18-Month Construction** | | **80,056** |
| **Amortized 18-Month Construction** | | 2,287 |

**38- Month by Project Phase**

| Phase | $MTCO_2e$ |
|---|---|
| **2025** | |
| PV Solar | 42 |
| Total 2025 | 42 |
| **2026** | |
| PV Solar | 38,087 |
| Ph5: Battery Storage | 2,031 |
| Ph6: Hydrogen | 8,672 |
| Total 2026 | 48,789 |
| **2027** | |
| PV Solar | 12,443 |
| Ph5: Battery Storage | 3,172 |
| Ph6: Hydrogen | 8,944 |
| Ph7: Utility Switchyard | 6,665 |
| Total 2026 | 31,225 |
| Total 18-Month Construction | 80,056 |
| Amortized 18-Month Construc | 2,287 |

## Darden Renewable Energy Project
## Operational Summary Tables (Original Analysis)

**Note: The following shows the original results; those that changed are highlighted in yellow. Updated results are shown on page 81 of this PDF.**

| Phase | $MTCO_2e$ | | | |
|---|---|---|---|---|
| **36-Month** | | Offsets | | |
| PV Solar | 18,281 | | 162,129 | Total Ops |
| Hydrogen Facility | 142,342 | | | |
| SF6 | 2,343 | | | |
| Amortized 36-Month Construction | 2,752 | | | |
| Decommissioning | 2,752 | | | |
| Total Ops + 36- Month Const. | 167,633 | 504,499 | -336,866 | |
| Hydrogen 2nd Site | 2 | | | |
| SF6 | 1,506 | | 2,343 | SF6 |
| Total Ops + 36- Month Const. | 166,126 | | 1.445301 | % total |
| Overall Total | **167,635** | 504,499 | -336,864 | |
| **18-Month** | | | | |
| PV Solar | 18,281 | | | |
| Hydrogen Facility | 142,342 | | | |
| SF6 | 2,343 | | | |
| Amortized 18-Month Construction | 2,287 | | 2,343 | SF6 |
| Decommissioning | 2,287 | | 1.445301 | % total |
| Total Ops + 18- Month Const. | 166,704 | 504,499 | -337,795 | |
| Hydrogen 2nd Site | 2 | | | |
| SF6 | 1,506 | | | |
| Total Ops + 18- Month Const. | 165,198 | | | |
| Overall Total | **166,706** | 504,499 | -337,793 | |

## Darden Renewable Energy Project
## 36-Month Construction Summary Tables (Revised Analysis)

The Project has changed to remove the hydrogen facility from the project description. Based on comments from the CEC, the GHG quantification was updated to remove the Hydrogen Facility emissions and to update the offset emissions to account for increasing renewable sources over the 35 year life-time. These Summary Tables have been updated to reflect the changes, however the Hydrogen Facility information has not been removed from the rest of the appendices.

# Darden Renewable Energy Project
# 36-Month Construction Summary Tables (Revised Analysis)

**36-Month GHG**

| Phase | | $MTCO_2e$ |
|---|---|---|
| **2025** | | |
| Ph1: Site Prep | | 28 |
| | Total 2025 | 28 |
| **2026** | | |
| Ph1: Site Prep | | 5,431 |
| Ph2: PV Panel System | | 13,978 |
| Ph7: Utility Switchyard | | 5,112 |
| | Total 2026 | 24,521 |
| **2027** | | |
| Ph2: PV Panel System | | 23,543 |
| Ph3: Inverters, etc | | 6,842 |
| Ph4: Gen-tie | | 328 |
| Ph7: Utility Switchyard | | 1,515 |
| | Total 2027 | 32,228 |
| **2028** | | |
| Ph2: PV Panel System | | 7,750 |
| Ph3: Inverters, etc | | 4,232 |
| Ph4: Gen-tie | | 2,753 |
| Ph5: Battery Storage | | 3,987 |
| Ph6: Hydrogen | | 0 |
| | Total 2028 | 18,722 |
| **Total 36-Month Construction** | | **75,498** |
| **Amortized 36-Month Construction** | | 2,157 |

**36- Month by Project Phase**

| Phase | | $MTCO_2e$ |
|---|---|---|
| | | |
| PV Solar | | 28 |
| | Total 2025 | 28 |
| **2026** | | |
| PV Solar | | 19,408 |
| Ph7: Utility Switchyard | | 5,112 |
| | Total 2026 | 24,521 |
| **2027** | | |
| PV Solar | | 30,713 |
| Ph7: Utility Switchyard | | 1,515 |
| | Total 2027 | 32,228 |
| **2028** | | |
| PV Solar | | 14,735 |
| Ph5: Battery Storage | | 3,987 |
| Ph6: Hydrogen | | 0 |
| | Total 2028 | 18,722 |
| | **Total 36-Month Construction** | 75,498 |
| | **Amortized 36-Month Construction** | 2,157 |

**Darden Renewable Energy Project**
**18-Month Construction Summary Tables (revised Analysis)**

The Project has changed to remove the hydrogen facility from the project description. Based on comments from the CEC, the GHG quantification was updated to remove the Hydrogen Facility emissions and to update the offset emissions to account for increasing renewable sources over the 35 year life-time. These Summary Tables have been updated to reflect the changes, however the Hydrogen Facility information has not been removed from the rest of the appendices.

# Darden Renewable Energy Project
## 18-Month Construction Summary Tables (revised Analysis)

**18- Month** GHG

| Phase | | $MTCO_2e$ |
|---|---|---|
| **2025** | | |
| Ph1: Site Prep | | 42 |
| | Total 2025 | 42 |
| **2026** | | |
| Ph1: Site Prep | | 5,209 |
| Ph2: PV Panel System | | 21,067 |
| Ph3: Inverters, etc | | 8,274 |
| Ph4: Gen-tie | | 3,536 |
| Ph5: Battery Storage | | 2,031 |
| Ph6: Hydrogen | | 0 |
| | Total 2026 | 40,117 |
| **2027** | | |
| Ph2: PV Panel System | | 9,649 |
| Ph3: Inverters, etc | | 2,795 |
| Ph5: Battery Storage | | 3,172 |
| Ph6: Hydrogen | | 0 |
| Ph7: Utility Switchyard | | 6,665 |
| | Total 2027 | 22,281 |
| **Total 18-Month Construction** | | **62,440** |
| **Amortized 18-Month Construction** | | 1,784 |

**38- Month by Project Phase**

| Phase | $MTCO_2e$ |
|---|---|
| **2025** | |
| PV Solar | 42 |
| Total 2025 | 42 |
| **2026** | |
| PV Solar | 38,087 |
| Ph5: Battery Storage | 2,031 |
| Ph6: Hydrogen | 0 |
| Total 2026 | 40,117 |
| **2027** | |
| PV Solar | 12,443 |
| Ph5: Battery Storage | 3,172 |
| Ph6: Hydrogen | 0 |
| Ph7: Utility Switchyard | 6,665 |
| Total 2026 | 22,281 |
| Total 18-Month Construction | 62,440 |
| Amortized 18-Month Construc | 1,784 |

**Darden Renewable Energy Project**
**Operational Summary Tables (Revised Analysis)**

The Project has changed to remove the hydrogen facility from the project description. Based on comments from the CEC, the GHG quantification was updated to remove the Hydrogen Facility emissions and to update the offset emissions to account for increasing renewable sources over the 35 year life-time. These Summary Tables have been updated to reflect the changes, however the Hydrogen Facility information has not been removed from the rest of the appendices.

# Darden Renewable Energy Project
# Operational Summary Tables (Revised Analysis)

**Operational GHG Emissions**

| Phase | $MTCO_2e$ | | | | |
|---|---|---|---|---|---|
| **36-Month** | | Offsets | | | |
| PV Solar | 18,281 | | 20,625 | Total Ops | |
| Hydrogen Facility | 0 | | | | |
| SF6 | 2,343 | | | | |
| Amortized 36-Month Construction | 2,157 | | | | |
| Decommissioning | 2,157 | | | | |
| Total Ops + 36- Month Const. | 24,939 | 457,643 | -432,704 | | |
| Hydrogen 2nd Site | 0 | | | | 20,625 |
| SF6 | 2,343 | | 2,343 | SF6 | |
| Total Ops + 36- Month Const. | 22,595 | | 11.3615 | % total | |
| Overall Total | **24,939** | 457,643 | -432,704 | | |
| **18-Month** | | | | | |
| PV Solar | 18,281 | | | | |
| Hydrogen Facility | 0 | | | | |
| SF6 | 2,343 | | | | |
| Amortized 18-Month Construction | 1,784 | | 2,343 | SF6 | |
| Decommissioning | 1,784 | | 11.3615 | % total | |
| Total Ops + 18- Month Const. | 24,193 | 457,643 | -433,451 | | |
| Hydrogen 2nd Site | 0 | | | | |
| SF6 | 2,343 | | | | |
| Total Ops + 18- Month Const. | 21,849 | | | | |
| Overall Total | **24,193** | 457,643 | -433,451 | | |
| | | | -433,451 | | |

# Darden Renewable Energy Project
# Construction CalEEMod - GHG Emissions
# 18- Month Construction Schedule

**Ph1: Site Prep / Grading (2025) [3.11]**

| | | NB$CO_2$ | $CO_2$T | $CH_4$ | $N_2O$ | R | $CO_2$e | | | | | Haul 60 mi |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Category | MT $CO_2$e | | | | | | | | | | |
| | Off-Road | 36.8 | 36.8 | < 0.005 | < 0.005 | | 36.9 | | | | | |
| | Dust | | | | | | | | | | | |
| | On-Site Truck | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| | Worker | 0.72 | 0.72 | < 0.005 | < 0.005 | < 0.005 | 0.73 | | | | | |
| | Vendor | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| 251 | Hauling | 0.94 | 0.94 | < 0.005 | < 0.005 | < 0.005 | 4.099667 | | | | | 0.98 |
| 60 | UTV | | | | | | 1.65E-03 | | | | | |
| | Helicopter | | | | | | | | | | | |
| | **Total** | **38.46** | **38.46** | **0** | **0** | **0** | **41.73131321** | **0** | **0** | **0** | **0** | **0.98** |

**Ph1: Site Prep / Grading (2026) [3.13]**

| | NB$CO_2$ | $CO_2$T | $CH_4$ | $N_2O$ | R | $CO_2$e | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | MT $CO_2$e | | | | | | | | | | |
| Off-Road | 4601 | 4601 | 0.19 | 0.04 | | 4617 | | | | | |
| Dust | | | | | | | | | | | |
| On-Site Truck | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Worker | 88.4 | 88.4 | < 0.005 | < 0.005 | 0.14 | 89.9 | | | | | |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Hauling | 115 | 115 | < 0.005 | 0.02 | 0.12 | 502 | | | | | 120 |
| UTV | | | | | | 1.47E-01 | | | | | |
| Helicopter | | | | | | | | | | | |
| **Total** | **4804.4** | **4804.4** | **0.19** | **0.06** | **0.26** | **5209.046542** | **0** | **0** | **0** | **0** | **120** |

**Hauling (60)**

## Darden Renewable Energy Project
## Construction CalEEMod - GHG Emissions
## 18- Month Construction Schedule

**Ph2: PV Panel System / 1st Site Prep (2026) [3.1]**

| | $NBCO_2$ | $CO_2T$ | $CH_4$ | $N_2O$ | R | $CO_2e$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | | | | | | MT $CO_2e$ | | | | | |
| Off-Road | 18878 | 18878 | 0.77 | 0.15 | | 18943 | | | | | |
| Dust | | | | | | | | | | | |
| On-Site Truck | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Worker | 869 | 869 | 0.03 | 0.04 | 1.41 | 883 | | | | | |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Hauling | 281 | 281 | 0.01 | 0.04 | 0.29 | 1234.083 | | | | | 295 |
| UTV | | | | | | 7.36E+00 | | | | | |
| Helicopter | | | | | | | | | | | |
| **Total** | **20028** | **20028** | **0.81** | **0.23** | **1.7** | **21067.43942** | **0** | **0** | **0** | **0** | **295** |
| | | | | | | 295 | | | | | |

**Ph2: PV Panel System / 1st Site Prep (2027) [3.3]**

| | $NBCO_2$ | $CO_2T$ | $CH_4$ | $N_2O$ | R | $CO_2e$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | | | | | | MT $CO_2e$ | | | | | |
| Off-Road | 8667 | 8667 | 0.35 | 0.07 | | 8696 | | | | | |
| Dust | | | | | | | | | | | |
| On-Site Truck | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Worker | 391 | 391 | 0.01 | 0.02 | 0.59 | 397 | | | | | |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Hauling | 126 | 126 | < 0.005 | 0.02 | 0.12 | 552.2 | | | | | 132 |
| UTV | | | | | | 3.39E+00 | | | | | |
| Helicopter | | | | | | | | | | | |
| **Total** | **9184** | **9184** | **0.36** | **0.11** | **0.71** | **9648.592533** | **0** | **0** | **0** | **0** | **132** |
| | | | | | | 132 | | | | | |

**Darden Renewable Energy Project**
**Construction CalEEMod - GHG Emissions**
**18- Month Construction Schedule**

**0**

| | $NBCO_2$ | $CO_2T$ | $CH_4$ | $N_2O$ | R | $CO_2e$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | | MT $CO_2e$ | | | | | | | | | |
| Off-Road | | | | | | | | | | | |
| Dust | | | | | | | | | | | |
| On-Site Truck | | | | | | | | | | | |
| Worker | | | | | | | | | | | |
| Vendor | | | | | | | | | | | |
| Hauling | | | | | | | | | | | |
| UTV | | | | | | | | | | | |
| Helicopter | | | | | | | | | | | |
| **Total** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** |

Ph3: Inverters, etc / 1st Building Construction (2026) [3.15]

| | $NBCO_2$ | $CO_2T$ | $CH_4$ | $N_2O$ | R | $CO_2e$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | | MT $CO_2e$ | | | | | | | | | |
| Off-Road | 5098 | 5098 | 0.21 | 0.04 | | 5116 | | | | | |
| Dust | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Worker | 212 | 212 | 0.01 | 0.01 | 0.35 | 216 | | | | | |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Hauling | 671 | 671 | 0.01 | 0.11 | 0.69 | 2940.883 | | | | | 703 |
| UTV | | | | | | 1.49E+00 | | | | | |
| Helicopter | | | | | | | | | | | |
| **Total** | **5981** | **5981** | **0.23** | **0.16** | **1.04** | **8274.373123** | **0** | **0** | **0** | **0** | **703** |
| | | | | | | 703 | | | | | |

# Darden Renewable Energy Project
# Construction CalEEMod - GHG Emissions
# 18- Month Construction Schedule

**Ph3: Inverters, etc / 1st Building Construction (2027) [3.17]**

| | $NBCO_2$ | $CO_2T$ | $CH_4$ | $N_2O$ | R | $CO_2e$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | MT $CO_2e$ | | | | | | | | | | |
| Off-Road | 1449 | 1449 | 0.06 | 0.01 | | 1454 | | | | | |
| Dust | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Worker | 59.1 | 59.1 | < 0.005 | < 0.005 | 0.09 | 60.1 | | | | | |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Hauling | 186 | 186 | < 0.005 | 0.03 | 0.18 | 815.75 | | | | | 195 |
| UTV | | | | | | 2.77E+00 | | | | | |
| Helicopter | | | | | | 462.28 | | | | | |
| **Total** | **1694.1** | **1694.1** | **0.06** | **0.04** | **0.27** | **2794.902814** | **0** | **0** | **0** | **0** | **195** |
| | | | | | | 195 | | | | | |

**Ph4: Gen-tie / 2nd Building Construction (2026) [3.19]**

| | $NBCO_2$ | $CO_2T$ | $CH_4$ | $N_2O$ | R | $CO_2e$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | MT $CO_2e$ | | | | | | | | | | |
| Off-Road | 467 | 467 | 0.02 | < 0.005 | | 469 | | | | | |
| Dust | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Worker | 49.5 | 49.5 | < 0.005 | < 0.005 | 0.08 | 50.3 | | | | | |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Hauling | 266 | 266 | 0.01 | 0.04 | 0.27 | 1167.15 | | | | | 279 |
| UTV | | | | | | 9.88E-02 | | | | | |
| Helicopter | | | | | | 1,849.13 | | | | | |
| **Total** | **782.5** | **782.5** | **0.03** | **0.04** | **0.35** | **3535.682122** | **0** | **0** | **0** | **0** | **279** |
| | | | | | | 279 | | | | | |

**Darden Renewable Energy Project**
**Construction CalEEMod - GHG Emissions**
**18- Month Construction Schedule**

**Hauling 60 mi**

| | $NBCO_2$ | $CO_2T$ | $CH_4$ | $N_2O$ | R | $CO_2e$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | MT $CO_2e$ | | | | | | | | | | |
| Off-Road | | | | | | | | | | | |
| Dust | | | | | | | | | | | |
| Worker | | | | | | | | | | | |
| Vendor | | | | | | | | | | | |
| Hauling | | | | | | | | | | | |
| UTV | | | | | | | | | | | |
| Helicopter | | | | | | | | | | | |
| **Total** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** |

**Ph5: Battery Storage / 3rd Building Construction (2026) [3.21]**

| | $NBCO_2$ | $CO_2T$ | $CH_4$ | $N_2O$ | R | $CO_2e$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | MT $CO_2e$ | | | | | | | | | | |
| Off-Road | 817 | 817 | 0.03 | 0.01 | | 820 | | | | | |
| Dust | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Worker | 34.5 | 34.5 | < 0.005 | < 0.005 | 0.06 | 35.1 | | | | | |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Hauling | 268 | 268 | 0.01 | 0.04 | 0.28 | 1175.517 | | | | | 281 |
| UTV | | | | | | 4.45E-02 | | | | | |
| Helicopter | | | | | | | | | | | |
| **Total** | **1119.5** | **1119.5** | **0.04** | **0.05** | **0.34** | **2030.661123** | **0** | **0** | **0** | **0** | **281** |

# Darden Renewable Energy Project
# Construction CalEEMod - GHG Emissions
# 18- Month Construction Schedule

**Ph5: Battery Storage / 3rd Building Construction (2027) [3.23]**

| | $NBCO_2$ | $CO_2T$ | $CH_4$ | $N_2O$ | R | $CO_2e$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | MT $CO_2e$ | | | | | | | | | | |
| Off-Road | 1294 | 1294 | 0.05 | 0.01 | | 1298 | | | | | |
| Dust | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Worker | 53.5 | 53.5 | < 0.005 | < 0.005 | 0.08 | 54.4 | | | | | |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Hauling | 415 | 415 | 0.01 | 0.06 | 0.4 | 1819.75 | | | | | 435 |
| UTV | | | | | | 6.01E-02 | | | | | |
| Helicopter | | | | | | | | | | | |
| **Total** | **1762.5** | **1762.5** | **0.06** | **0.07** | **0.48** | **3172.210099** | **0** | **0** | **0** | **0** | **435** |

**Ph6: Hydrogen / 2nd Site Prep (2026) [3.5]**

| | $NBCO_2$ | $CO_2T$ | $CH_4$ | $N_2O$ | R | $CO_2e$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | MT $CO_2e$ | | | | | | | | | | |
| Off-Road | 5039 | 5039 | 0.2 | 0.04 | | 5056 | | | | | |
| Dust | | | | | | | | | | | |
| On-Site Truck | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Worker | 67.2 | 67.2 | < 0.005 | < 0.005 | 0.11 | 68.3 | | | | | |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Hauling | 808 | 808 | 0.02 | 0.13 | 0.83 | 3547.467 | | | | | 848 |
| UTV | | | | | | 1.48E-01 | | | | | |
| Helicopter | | | | | | | | | | | |
| **Total** | **5914.2** | **5914.2** | **0.22** | **0.17** | **0.94** | **8671.914361** | **0** | **0** | **0** | **0** | **848** |

# Darden Renewable Energy Project
# Construction CalEEMod - GHG Emissions
# 18- Month Construction Schedule

Ph6: Hydrogen / 2nd Site Prep (2027) [3.9]

| | $NBCO_2$ | $CO_2T$ | $CH_4$ | $N_2O$ | R | $CO_2e$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | MT $CO_2e$ | | | | | | | | | | |
| Off-Road | 5250 | 5250 | 0.21 | 0.04 | | 5268 | | | | | |
| Dust | | | | | | | | | | | |
| On-Site Truck | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Worker | 68.6 | 68.6 | < 0.005 | < 0.005 | 0.1 | 69.7 | | | | | |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Hauling | 823 | 823 | 0.01 | 0.13 | 0.8 | 3606.033 | | | | | 862 |
| UTV | | | | | | 1.17E-01 | | | | | |
| Helicopter | | | | | | | | | | | |
| **Total** | **6141.6** | **6141.6** | **0.22** | **0.17** | **0.9** | **8943.850238** | **0** | **0** | **0** | **0** | **862** |

Ph7: Utility Switchyard / 3rd Site Prep (2026) [3.9]

| | $NBCO_2$ | $CO_2T$ | $CH_4$ | $N_2O$ | R | $CO_2e$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | MT $CO_2e$ | | | | | | | | | | |
| Off-Road | 5344 | 5344 | 0.22 | 0.04 | | 5363 | | | | | |
| Dust | | | | | | | | | | | |
| On-Site Truck | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Worker | 71.3 | 71.3 | < 0.005 | < 0.005 | 0.12 | 72.5 | | | | | |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Hauling | 280 | 280 | 0.01 | 0.04 | 0.29 | 1229.9 | | | | | 294 |
| UTV | | | | | | | | | | | |
| Helicopter | | | | | | | | | | | |
| **Total** | **5695.3** | **5695.3** | **0.23** | **0.08** | **0.41** | **6665.4** | **0** | **0** | **0** | **0** | **294** |

# Darden Renewable Energy Project
# Construction CalEEMod - GHG Emissions
# 36-Month Construction Schedule

**Ph1: Site Prep / Grading (2025) [Table 3.13]**

| | $NBCO_2$ | $CO_2T$ | $CH_4$ | $N_2O$ | R | $CO_2e$ | | | | | Haul 60 mi |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | MT $CO_2e$ | | | | | | | | | | |
| Off-Road | 24.3 | 24.3 | < 0.005 | < 0.005 | | 24.4 | | | | | |
| Dust | | | | | | | | | | | |
| On-Site Truck | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Worker | 0.58 | 0.58 | < 0.005 | < 0.005 | < 0.005 | 0.59 | | | | | |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Hauling | 0.67 | 0.67 | < 0.005 | < 0.005 | < 0.005 | 2.928333 | | | | | 0.7 |
| UTV | | | | | | 1.65E-03 | | | | | |
| Helicopter | | | | | | | | | | | |
| **Total** | **25.55** | **25.55** | **0** | **0** | **0** | **27.91997987** | **0** | **0** | **0** | **0** | **0.7** |

**Ph1: Site Prep / Grading (2026) [3.15]**

| | $NBCO_2$ | $CO_2T$ | $CH_4$ | $N_2O$ | R | $CO_2e$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | MT $CO_2e$ | | | | | | | | | | |
| Off-Road | 4742 | 4742 | 0.19 | 0.04 | | 4758 | | | | | |
| Dust | | | | | | | | | | | |
| On-Site Truck | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Worker | 110 | 110 | < 0.005 | 0.01 | 0.18 | 112 | | | | | |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Hauling | 128 | 128 | < 0.005 | 0.02 | 0.13 | 560.5667 | | | | | 134 |
| UTV | | | | | | 2.29E-01 | | | | | |
| Helicopter | | | | | | | | | | | |
| **Total** | **4980** | **4980** | **0.19** | **0.07** | **0.31** | **5430.795536** | **0** | **0** | **0** | **0** | **134** |

# Darden Renewable Energy Project
# Construction CalEEMod - GHG Emissions
# 36-Month Construction Schedule

**Ph2: PV Panel System / 1st Site Prep (2026) [3.1]**

| | $NBCO_2$ | $CO_2T$ | $CH_4$ | $N_2O$ | R | $CO_2e$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | MT $CO_2e$ | | | | | | | | | | |
| Off-Road | 9466 | 9466 | 0.38 | 0.08 | | 9498 | | | | | |
| Dust | | | | | | | | | | | |
| On-Site Truck | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Worker | 456 | 456 | 0.02 | 0.02 | 0.74 | 464 | | | | | |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Hauling | 915 | 915 | 0.02 | 0.15 | 0.94 | 4011.817 | | | | | 959 |
| UTV | | | | | | 3.80E+00 | | | | | |
| Helicopter | | | | | | | | | | | |
| **Total** | **10837** | **10837** | **0.42** | **0.25** | **1.68** | **13977.62018** | **0** | **0** | **0** | **0** | **959** |

**Ph2: PV Panel System / 1st Site Prep (2027) [3.3]**

| | $NBCO_2$ | ROG | NOx | CO | SO2 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/year | | | | | | | | | | |
| Off-Road | 16063 | 16063 | 0.65 | 0.13 | | 16118 | | | | | |
| Dust | | | | | | | | | | | |
| On-Site Truck | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Worker | 759 | 759 | 0.03 | 0.04 | 1.14 | 771 | | | | | |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Hauling | 1517 | 1517 | 0.02 | 0.24 | 1.47 | 6647.317 | | | | | 1589 |
| UTV | | | | | | 6.45E+00 | | | | | |
| Helicopter | | | | | | | | | | | |
| **Total** | **18339** | **18339** | **0.7** | **0.41** | **2.61** | **23542.76287** | **0** | **0** | **0** | **0** | **1589** |

**Darden Renewable Energy Project**
**Construction CalEEMod - GHG Emissions**
**36-Month Construction Schedule**

**Ph2: PV Panel System / 1st Site Prep (2028) [3.5]**

| | $NBCO_2$ | $CO_2T$ | $CH_4$ | $N_2O$ | R | $CO_2e$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | MT $CO_2e$ | | | | | | | | | | |
| Off-Road | 5324 | 5324 | 0.22 | 0.04 | | 5342 | | | | | |
| Dust | | | | | | | | | | | |
| On-Site Truck | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Worker | 247 | 247 | 0.01 | 0.01 | 0.34 | 251 | | | | | |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Hauling | 490 | 490 | 0.01 | 0.08 | 0.45 | 2150.233 | | | | | 514 |
| UTV | | | | | | 6.45E+00 | | | | | |
| Helicopter | | | | | | | | | | | |
| **Total** | **6061** | **6061** | **0.24** | **0.13** | **0.79** | **7749.67954** | **0** | **0** | **0** | **0** | **514** |

Ph3: Inverters, etc / 1st Building Construction (2027) [3.17]

| | $NBCO_2$ | $CO_2T$ | $CH_4$ | $N_2O$ | R | $CO_2e$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | MT $CO_2e$ | | | | | | | | | | |
| Off-Road | 4215 | 4215 | 0.17 | 0.03 | | 4229 | | | | | |
| Dust | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Worker | 187 | 187 | 0.01 | 0.01 | 0.28 | 190 | | | | | |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Hauling | 552 | 552 | 0.01 | 0.09 | 0.53 | 2422.15 | | | | | 579 |
| UTV | | | | | | 1.28E+00 | | | | | |
| Helicopter | | | | | | | | | | | |
| **Total** | **4954** | **4954** | **0.19** | **0.13** | **0.81** | **6842.426069** | **0** | **0** | **0** | **0** | **579** |

**Darden Renewable Energy Project**
**Construction CalEEMod - GHG Emissions**
**36-Month Construction Schedule**

**Ph3: Inverters, etc / 1st Building Construction (2028) [3.19]**

| | $NBCO_2$ | $CO_2T$ | $CH_4$ | $N_2O$ | R | $CO_2e$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | MT $CO_2e$ | | | | | | | | | | |
| Off-Road | 2342 | 2342 | 0.09 | 0.02 | | 2350 | | | | | |
| Dust | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Worker | 102 | 102 | < 0.005 | < 0.005 | 0.14 | 104 | | | | | |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Hauling | 299 | 299 | < 0.005 | 0.05 | 0.27 | 1313.567 | | | | | 314 |
| UTV | | | | | | 2.06E+00 | | | | | |
| Helicopter | | | | | | 462.28 | | | | | |
| **Total** | **2743** | **2743** | **0.09** | **0.07** | **0.41** | **4231.908175** | **0** | **0** | **0** | **0** | **314** |

**Ph4: Gen-tie / 2nd Building Construction (2027) [3.21]**

| | $NBCO_2$ | $CO_2T$ | $CH_4$ | $N_2O$ | R | $CO_2e$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | MT $CO_2e$ | | | | | | | | | | |
| Off-Road | 91.6 | 91.6 | < 0.005 | < 0.005 | | 92 | | | | | |
| Dust | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Worker | 11.1 | 11.1 | < 0.005 | < 0.005 | 0.02 | 11.3 | | | | | |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Hauling | 51.1 | 51.1 | < 0.005 | 0.01 | 0.05 | 224.2267 | | | | | 53.6 |
| UTV | | | | | | 1.98E-02 | | | | | |
| Helicopter | | | | | | | | | | | |
| **Total** | **153.8** | **153.8** | **0** | **0.01** | **0.07** | **327.5464252** | **0** | **0** | **0** | **0** | **53.6** |

# Darden Renewable Energy Project
## Construction CalEEMod - GHG Emissions
## 36-Month Construction Schedule

**Ph4: Gen-tie / 2nd Building Construction (2028) [3.23]**

| | $NBCO_2$ | $CO_2T$ | $CH_4$ | $N_2O$ | R | $CO_2e$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | MT $CO_2e$ | | | | | | | | | | |
| Off-Road | 389 | 389 | 0.02 | < 0.005 | | 391 | | | | | |
| Dust | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Worker | 46.2 | 46.2 | < 0.005 | < 0.005 | 0.06 | 46.9 | | | | | |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Hauling | 212 | 212 | < 0.005 | 0.03 | 0.19 | 928.7 | | | | | 222 |
| UTV | | | | | | 1.98E-02 | | | | | |
| Helicopter | | | | | | 1,386.85 | | | | | |
| **Total** | **647.2** | **647.2** | **0.02** | **0.03** | **0.25** | **2753.469755** | **0** | **0** | **0** | **0** | **222** |

**Ph5: Battery Storage / 3rd Building Construction (2028) [3.25]**

| | $NBCO_2$ | $CO_2T$ | $CH_4$ | $N_2O$ | R | $CO_2e$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | MT $CO_2e$ | | | | | | | | | | |
| Off-Road | 844 | 844 | 0.03 | 0.01 | | 847 | | | | | |
| Dust | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Worker | 76.1 | 76.1 | < 0.005 | < 0.005 | 0.11 | 77.3 | | | | | |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Hauling | 697 | 697 | 0.01 | 0.11 | 0.64 | 3062.2 | | | | | 732 |
| UTV | | | | | | 1.32E-01 | | | | | |
| Helicopter | | | | | | | | | | | |
| **Total** | **1617.1** | **1617.1** | **0.04** | **0.12** | **0.75** | **3986.631723** | **0** | **0** | **0** | **0** | **732** |

**Darden Renewable Energy Project**
**Construction CalEEMod - GHG Emissions**
**36-Month Construction Schedule**

**0**

| | $NBCO_2$ | $CO_2T$ | $CH_4$ | $N_2O$ | R | $CO_2e$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | MT $CO_2e$ | | | | | | | | | | |
| Off-Road | | | | | | | | | | | |
| Dust | | | | | | | | | | | |
| Worker | | | | | | | | | | | |
| Vendor | | | | | | | | | | | |
| Hauling | | | | | | | | | | | |
| UTV | | | | | | | | | | | |
| Helicopter | | | | | | | | | | | |
| **Total** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** |

**Ph6: Hydrogen / 2nd Site Prep (2028) [3.7]**

| | $NBCO_2$ | $CO_2T$ | $CH_4$ | $N_2O$ | R | $CO_2e$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | MT $CO_2e$ | | | | | | | | | | |
| Off-Road | 12969 | 12969 | 0.53 | 0.11 | | 13013 | | | | | |
| Dust | | | | | | | | | | | |
| On-Site Truck | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Worker | 143 | 143 | < 0.005 | 0.01 | 0.2 | 145 | | | | | |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Hauling | 1744 | 1744 | 0.03 | 0.28 | 1.59 | 7651.317 | | | | | 1829 |
| UTV | | | | | | 3.29E-01 | | | | | |
| Helicopter | | | | | | | | | | | |
| **Total** | **14856** | **14856** | **0.56** | **0.4** | **1.79** | **20809.64597** | **0** | **0** | **0** | **0** | **1829** |

**Darden Renewable Energy Project**
**Construction CalEEMod - GHG Emissions**
**36-Month Construction Schedule**

0

| | $NBCO_2$ | $CO_2T$ | $CH_4$ | $N_2O$ | R | $CO_2e$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | | | | | | MT $CO_2e$ | | | | | |
| Off-Road | | | | | | | | | | | |
| Dust | | | | | | | | | | | |
| On-Site Truck | | | | | | | | | | | |
| Worker | | | | | | | | | | | |
| Vendor | | | | | | | | | | | |
| Hauling | | | | | | | | | | | |
| UTV | | | | | | | | | | | |
| Helicopter | | | | | | | | | | | |
| **Total** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** |

Ph7: Utility Switchyard / 3rd Site Prep (2026) [3.11]

| | $NBCO_2$ | $CO_2T$ | $CH_4$ | $N_2O$ | R | $CO_2e$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | | | | | | MT $CO_2e$ | | | | | |
| Off-Road | 4112 | 4112 | 0.17 | 0.03 | | 4126 | | | | | |
| Dust | | | | | | | | | | | |
| On-Site Truck | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Worker | 60.8 | 60.8 | < 0.005 | < 0.005 | 0.1 | 61.9 | | | | | |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Hauling | 211 | 211 | < 0.005 | 0.03 | 0.22 | 924.5167 | | | | | 221 |
| UTV | | | | | | | | | | | |
| Helicopter | | | | | | | | | | | |
| **Total** | **4383.8** | **4383.8** | **0.17** | **0.06** | **0.32** | **5112.416667** | **0** | **0** | **0** | **0** | **221** |

**Darden Renewable Energy Project**
**Construction CalEEMod - GHG Emissions**
**36-Month Construction Schedule**

Ph7: Utility Switchyard / 3rd Site Prep (2027) [3.13]

| | $NBCO_2$ | $CO_2T$ | $CH_4$ | $N_2O$ | R | $CO_2e$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | MT $CO_2e$ | | | | | | | | | | |
| Off-Road | 1224 | 1224 | 0.05 | 0.01 | | 1228 | | | | | |
| Dust | | | | | | | | | | | |
| On-Site Truck | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Worker | 17.7 | 17.7 | < 0.005 | < 0.005 | 0.03 | 18 | | | | | |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Hauling | 61.4 | 61.4 | < 0.005 | 0.01 | 0.06 | 268.9883 | | | | | 64.3 |
| UTV | | | | | | | | | | | |
| Helicopter | | | | | | | | | | | |
| **Total** | **1303.1** | **1303.1** | **0.05** | **0.02** | **0.09** | **1514.988333** | **0** | **0** | **0** | **0** | **64.3** |

# Darden Renewable Energy Project
# Construction CalEEMod
# Annual Operational

**Operational Emissions Solar Facility**

| | TOG | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/year | | | | | | | | | | |
| Off-Road | 0.37 | 0.3 | 2.76 | 4.9 | 0.02 | 0.095 | 0.03 | 0.125 | 0.085 | 0.005 | 0.09 |
| Mobile | 0.03 | 0.03 | 0.03 | 0.18 | 0 | 0 | 0.04 | 0.04 | 0 | 0.02 | 0.02 |
| Energy | | | | | | | | | | | |
| Area Source | 0.853116 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Water | | | | | | | | | | | |
| Solid Waste | | | | | | | | | | | |
| Refrig. | | | | | | | | | | | |
| **Total** | **1.253115583** | **0.33** | **2.79** | **5.08** | **0.02** | **0.095** | **0.07** | **0.165** | **0.085** | **0.025** | **0.11** |

**Operational Emissions Hydrogen Facility (all)**

| | TOG | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/year | | | | | | | | | | |
| Off-Road | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mobile | 0.045 | 0.045 | 0.05 | 0.3 | 0.005 | 0.005 | 0.07 | 0.07 | 0.005 | 0.015 | 0.015 |
| Energy | | | | | | | | | | | |
| Area Source | | | | | | | | | | | |
| Water | | | | | | | | | | | |
| Solid Waste | 0.001 | 0.001 | 0.001 | 0.013 | 0.000 | 0.000 | 0.002 | 0.002 | 0.000 | 0.000 | 0.001 |
| Refrig. | | | | | | | | | | | |
| Stationary Sources | 0.725 | 0.66 | 1.85 | 1.68 | 0.003 | 0.097 | 0 | 0.097 | 0.097 | 0 | 0.097 |
| **Total** | **0.77081** | **0.70575** | **1.90093** | **1.99308** | **0.00803** | **0.102015** | **0.07195** | **0.16898** | **0.102015** | **0.01548** | **0.11251** |

# Darden Renewable Energy Project
# Construction CalEEMod
# Annual Operational

**Operational Emissions Hydrogen Facility (separate facility)**

| | TOG | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/year | | | | | | | | | | |
| Off-Road | | | | | | | | | | | |
| Mobile | | | | | | | | | | | |
| Energy | | | | | | | | | | | |
| Area Source | 0.044281 | | | | | | | | | | |
| Water | | | | | | | | | | | |
| Solid Waste | | | | | | | | | | | |
| Refrig. | | | | | | | | | | | |
| Stationary Sources | | | | | | | | | | | |
| **Total** | **0.044281132** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** |

# Darden Renewable Energy Project
# Construction CalEEMod
# Annual Operational

**Road and Fence Repair**

| | TOG | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | | | | | | tons/year | | | | | |
| Off-Road | 0.01 | 0.01 | 0.07 | 0.1 | 0.005 | 0.005 | | 0.005 | 0.005 | | 0.005 |
| Dust | | | | | | | 0 | 0 | | 0 | 0 |
| On-Site Truck | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Worker | 0.005 | 0.005 | 0.005 | 0.005 | 0 | 0 | 0.005 | 0.005 | 0 | 0.005 | 0.005 |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hauling | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total** | **0.015** | **0.015** | **0.075** | **0.105** | **0.005** | **0.005** | **0.005** | **0.01** | **0.005** | **0.005** | **0.01** |

**Road Reconditioning**

| | TOG | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | | | | | | tons/year | | | | | |
| Off-Road | 0.08 | 0.06 | 0.49 | 0.69 | < 0.005 | 0.02 | | 0.02 | 0.02 | | 0.02 |
| Dust | | | | | | | 0.03 | 0.03 | | 0.005 | 0.005 |
| On-Site Truck | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Worker | 0.005 | 0.005 | 0.005 | 0.005 | 0 | 0 | 0.005 | 0.005 | 0 | 0.005 | 0.005 |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hauling | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total** | **0.085** | **0.065** | **0.495** | **0.695** | **0** | **0.02** | **0.035** | **0.055** | **0.02** | **0.01** | **0.03** |

# Darden Renewable Energy Project
# Construction CalEEMod
# Annual Operational

**Solar Panel Washing**

| | TOG | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/year | | | | | | | | | | |
| Off-Road | 0.05 | 0.04 | 0.26 | 0.37 | 0.005 | 0.01 | | 0.01 | 0.01 | | 0.01 |
| Dust | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| On-Site Truck | | | | | | | | | | | |
| Worker | 0.01 | 0.01 | 0.01 | 0.07 | 0 | 0 | 0.01 | 0.01 | 0 | 0.005 | 0.005 |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hauling | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total** | **0.06** | **0.05** | **0.27** | **0.44** | **0.005** | **0.01** | **0.01** | **0.02** | **0.01** | **0.005** | **0.015** |

**Landscape Management**

| | TOG | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/year | | | | | | | | | | |
| Off-Road | 0.23 | 0.19 | 1.94 | 3.74 | 0.01 | 0.06 | | 0.06 | 0.05 | | 0.05 |
| Dust | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| On-Site Truck | | | | | | | | | | | |
| Worker | 0.01 | 0.01 | 0.01 | 0.1 | 0 | 0 | 0.02 | 0.02 | 0 | 0.005 | 0.005 |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hauling | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total** | **0.24** | **0.2** | **1.95** | **3.84** | **0.01** | **0.06** | **0.02** | **0.08** | **0.05** | **0.005** | **0.055** |

# Darden Renewable Energy Project
# Construction CalEEMod
# Annual Operational

**Hydrogen Facility**

| | TOG | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/year | | | | | | | | | | |
| Off-Road | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | 0 |
| Dust | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| On-Site Truck | | | | | | | | | | | |
| Worker | 0.04 | 0.04 | 0.02 | 0.29 | 0 | 0 | 0.06 | 0.06 | 0 | 0.01 | 0.01 |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hauling | 0.005 | 0.005 | 0.03 | 0.01 | 0.005 | 0.005 | 0.01 | 0.01 | 0.005 | 0.005 | 0.005 |
| **Total** | **0.045** | **0.045** | **0.05** | **0.3** | **0.005** | **0.005** | **0.07** | **0.07** | **0.005** | **0.015** | **0.015** |

***Additonal Calcs***

Hydrolizer Waste

| days/yr | TOG | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lbs/day | | | | | | | | | | |
| 1 | 0.27 | 0.25 | 0.31 | 4.36 | 0.01 | 0.005 | 0.65 | 0.66 | 0.005 | 0.16 | 0.17 |
| 6 | 1.62 | 1.5 | 1.86 | 26.16 | 0.06 | 0.03 | 3.9 | 3.96 | 0.03 | 0.96 | 1.02 |
| tons/yr | 0.00081 | 0.00075 | 0.00093 | 0.01308 | 0.00003 | 0.000015 | 0.00195 | 0.00198 | 0.000015 | 0.00048 | 0.00051 |

| ***Area Source ROG*** | | | SQFT | % Total | ROG - CP | ROG - AC |
|---|---|---|---|---|---|---|
| | | PV | 160,000 | 0.038884 | 0.85156 | 0.001555 |
| Consumer Products | 21.9 | HF | 8,000 | 0.001944 | 0.042578 | 0.001703 |
| Arch Coating | 0.04 | BESS | 3,946,800 | 0.959172 | N/A | N/A |

**Darden Renewable Energy Project**
**Construction CalEEMod**
**Annual Operational**

Stationary Source

| hrs/yr | TOG | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | | lbs/day (0.5 hrs/day) | | | | | | | | | |
| 1/2 hr;day | 7.25 | 6.6 | 18.5 | 16.8 | 0.03 | 0.97 | 0 | 0.97 | 0.97 | 0 | 0.97 |
| 1 hr /day | 14.5 | 13.2 | 37 | 33.6 | 0.06 | 1.94 | 0 | 1.94 | 1.94 | 0 | 1.94 |
| 100 hrs/yr | 1450 | 1320 | 3700 | 3360 | 6 | 194 | 0 | 194 | 194 | 0 | 194 |
| **tons/year** | **0.725** | **0.66** | **1.85** | **1.68** | **0.003** | **0.097** | **0** | **0.097** | **0.097** | **0** | **0.097** |

# Darden Renewable Energy Project
# Construction CalEEMod
# Operational - Daily

**Operational Emissions Solar Facility**

| Category | TOG | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | lbs/day | | | | | | | | | | |
| Off-Road | 9.94 | 8.35 | 66.79 | 101.23 | 0.19 | 2.82 | 2.58 | 5.4 | 2.6 | 0.28 | 2.88 |
| Mobile | 0.35 | 0.33 | 0.18 | 2.83 | 0 | 0 | 0.49 | 0.49 | 0 | 0.11 | 0.11 |
| Energy | | | | | | | | | | | |
| Area Source | 4.674249 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Water | | | | | | | | | | | |
| Solid Waste | | | | | | | | | | | |
| Refrig. | | | | | | | | | | | |
| **Total** | **14.96424905** | **8.68** | **66.97** | **104.06** | **0.19** | **2.82** | **3.07** | **5.89** | **2.6** | **0.39** | **2.99** |

**Operational Emissions Hydrogen Facility (all)**

| Category | TOG | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | lbs/day | | | | | | | | | | |
| Off-Road | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mobile | 0.24 | 0.235 | 0.28 | 1.93 | 0.005 | 0.005 | 0.37 | 0.38 | 0.005 | 0.09 | 0.1 |
| Energy | | | | | | | | | | | |
| Area Source | | | | | | | | | | | |
| Water | | | | | | | | | | | |
| Solid Waste | 0.270 | 0.250 | 0.310 | 4.360 | 0.010 | 0.005 | 0.650 | 0.660 | 0.005 | 0.160 | 0.170 |
| Refrig. | | | | | | | | | | | |
| Stationary Sources | 7.25 | 6.6 | 18.5 | 16.8 | 0.03 | 0.97 | 0 | 0.97 | 0.97 | 0 | 0.97 |
| **Total** | **7.76** | **7.085** | **19.09** | **23.09** | **0.045** | **0.98** | **1.02** | **2.01** | **0.98** | **0.25** | **1.24** |

## Darden Renewable Energy Project
## Construction CalEEMod
## Operational - Daily

**Operational Emissions Hydrogen Facility (separate facility)**

| | TOG | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | | lbs/day | | | | | | | | | |
| Off-Road | | | | | | | | | | | |
| Mobile | | | | | | | | | | | |
| Energy | | | | | | | | | | | |
| Area Source | 15.02787 | | | | | | | | | | |
| Water | | | | | | | | | | | |
| Solid Waste | | | | | | | | | | | |
| Refrig. | | | | | | | | | | | |
| Stationary Sources | | | | | | | | | | | |
| **Total** | **15.02787381** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** |

## Darden Renewable Energy Project
## Construction CalEEMod
## Operational - Daily

**Road and Fence Repair**

| Category | TOG | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | lbs/day | | | | | | | | | | |
| Off-Road | 0.85 | 0.71 | 4.81 | 6.83 | 0.02 | 0.17 | | 0.17 | 0.16 | | 0.16 |
| Dust | | | | | | | 0 | 0 | | 0 | 0 |
| On-Site Truck | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Worker | 0.03 | 0.03 | 0.02 | 0.26 | 0 | 0 | 0.05 | 0.05 | 0 | 0.01 | 0.01 |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hauling | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total** | **0.88** | **0.74** | **4.83** | **7.09** | **0.02** | **0.17** | **0.05** | **0.22** | **0.16** | **0.01** | **0.17** |

**Road Reconditioning**

| Category | TOG | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | lbs/day | | | | | | | | | | |
| Off-Road | 6.55 | 5.5 | 42.8 | 59.6 | 0.11 | 2.06 | | 2.06 | 1.9 | | 1.9 |
| Dust | | | | | | | 2.58 | 2.58 | | 0.28 | 0.28 |
| On-Site Truck | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Worker | 0.03 | 0.03 | 0.02 | 0.26 | 0 | 0 | 0.05 | 0.05 | 0 | 0.01 | 0.01 |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hauling | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total** | **6.58** | **5.53** | **42.82** | **59.86** | **0.11** | **2.06** | **2.63** | **4.69** | **1.9** | **0.29** | **2.19** |

# Darden Renewable Energy Project
# Construction CalEEMod
# Operational - Daily

**Solar Panel Washing**

| | TOG | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lbs/day | | | | | | | | | | |
| Off-Road | 0.81 | 0.68 | 4.28 | 6.1 | 0.02 | 0.14 | | 0.14 | 0.13 | | 0.13 |
| Dust | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| On-Site Truck | | | | | | | | | | | |
| Worker | 0.17 | 0.16 | 0.08 | 1.36 | 0 | 0 | 0.23 | 0.23 | 0 | 0.05 | 0.05 |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hauling | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total** | **0.98** | **0.84** | **4.36** | **7.46** | **0.02** | **0.14** | **0.23** | **0.37** | **0.13** | **0.05** | **0.18** |

**Landscape Management**

| | TOG | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lbs/day | | | | | | | | | | |
| Off-Road | 1.73 | 1.46 | 14.9 | 28.7 | 0.04 | 0.45 | | 0.45 | 0.41 | | 0.41 |
| Dust | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| On-Site Truck | | | | | | | | | | | |
| Worker | 0.12 | 0.11 | 0.06 | 0.95 | 0 | 0 | 0.16 | 0.16 | 0 | 0.04 | 0.04 |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hauling | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total** | **1.85** | **1.57** | **14.96** | **29.65** | **0.04** | **0.45** | **0.16** | **0.61** | **0.41** | **0.04** | **0.45** |

**Darden Renewable Energy Project**
**Construction CalEEMod**
**Operational - Daily**

**Hydrogen Facility**

| | TOG | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lbs/day | | | | | | | | | | |
| Off-Road | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | 0 |
| Dust | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| On-Site Truck | | | | | | | | | | | |
| Worker | 0.23 | 0.23 | 0.11 | 1.9 | 0 | 0 | 0.33 | 0.33 | 0 | 0.08 | 0.08 |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hauling | 0.01 | 0.005 | 0.17 | 0.03 | 0.005 | 0.005 | 0.04 | 0.05 | 0.005 | 0.01 | 0.02 |
| **Total** | **0.24** | **0.235** | **0.28** | **1.93** | **0.005** | **0.005** | **0.37** | **0.38** | **0.005** | **0.09** | **0.1** |

***Additonal Calcs***

Hydrolizer Waste

| days/yr | TOG | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lbs/day | | | | | | | | | | |
| 1 | 0.27 | 0.25 | 0.31 | 4.36 | 0.01 | 0.005 | 0.65 | 0.66 | 0.005 | 0.16 | 0.17 |
| 6 | 1.62 | 1.5 | 1.86 | 26.16 | 0.06 | 0.03 | 3.9 | 3.96 | 0.03 | 0.96 | 1.02 |
| tons/yr | 0.00081 | 0.00075 | 0.00093 | 0.01308 | 0.00003 | 0.000015 | 0.00195 | 0.00198 | 0.000015 | 0.00048 | 0.00051 |

| ***Area Source ROG*** | | | SQFT | % Total | ROG - CP | ROG - AC |
|---|---|---|---|---|---|---|
| | tons/year | PV | 160,000 | 0.038884 | 0.85156 | 0.001555 |
| Consumer Products | 21.9 | HF | 8,000 | 0.001944 | 0.042578 | 0.001703 |
| Arch Coating | 0.04 | BESS | 3,946,800 | 0.959172 | N/A | N/A |
| | | | | | | |
| | lbs/year | PV | 160,000 | 0.038884 | 4.666083 | 0.008166 |
| Consumer Products | 120 | HF | 8,000 | 0.001944 | 0.233304 | 0.048994 |

**Darden Renewable Energy Project**
**Construction CalEEMod**
**Operational - Daily**

| | | | | | | |
|---|---|---|---|---|---|---|
| Arch Coating | 0.21 | BESS | 3,946,800 | 0.959172 | N/A | N/A |

Stationary Source

| hrs/yr | TOG | ROG | NOx | CO | SO2 | Exhaust PM10 | Fugitive PM10 | PM10 Total | Exhaust PM2.5 | Fugitive PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | | lbs/day | | | | | | | | | |
| 1/2 hr;day | 7.25 | 6.6 | 18.5 | 16.8 | 0.03 | 0.97 | 0 | 0.97 | 0.97 | 0 | 0.97 |
| 1 hr /day | 14.5 | 13.2 | 37 | 33.6 | 0.06 | 1.94 | 0 | 1.94 | 1.94 | 0 | 1.94 |
| 100 hrs/yr | 1450 | 1320 | 3700 | 3360 | 6 | 194 | 0 | 194 | 194 | 0 | 194 |
| **tons/year** | **0.725** | **0.66** | **1.85** | **1.68** | **0.003** | **0.097** | **0** | **0.097** | **0.097** | **0** | **0.097** |

# Darden Renewable Energy Project
# Construction CalEEMod
# Operational - GHG

**Operational Emissions Solar Facility**

| | $NBCO_2$ | $CO_2T$ | $CH_4$ | $N_2O$ | R | $CO_2e$ |
|---|---|---|---|---|---|---|
| Category | MT $CO_2e$ | | | | | |
| Off-Road | 783.3 | 783.3 | 0.04 | 0.02 | 0 | 786.4 |
| Mobile | 32.79 | 32.79 | 0.02 | 0.02 | 0.06 | 33.31 |
| Energy | 0 | 0 | 0 | 0 | 0 | 0 |
| Area Source | | | | | | |
| Water | | | | | | |
| Solid Waste | 13.3 | 0 | 13.3 | 1.33 | 0 | 46.5 |
| Refrig. | 0 | 0 | 0 | 0 | 17,415 | 17,415 |
| **Total** | **829** | **816** | **13** | **1** | **17,415** | **18,281** |

**Operational Emissions Hydrogen Facility (all)**

| | $NBCO_2$ | $CO_2T$ | $CH_4$ | $N_2O$ | R | $CO_2e$ |
|---|---|---|---|---|---|---|
| Category | MT $CO_2e$ | | | | | |
| Off-Road | 0 | 0 | 0 | 0 | 0 | 0 |
| Mobile | 78.7 | 78.7 | 0.01 | 0.01 | 0.1 | 80.9 |
| Energy | 0 | 0 | 0 | 0 | 0 | 141951.29 |
| Area Source | | | | | | |
| Water | | | | | | |
| Solid Waste | 2 | 2 | 0 | 0 | 0 | 2 |
| Refrig. | | | | | | |
| Stationary Sources | 306 | 306 | 0 | 0 | 0 | 307 |
| **Total** | **387** | **387** | **0** | **0** | **0** | **142,342** |

# Darden Renewable Energy Project
# Construction CalEEMod
# Operational - GHG

**Operational Emissions Hydrogen Facility (separate facility)**

| | $NBCO_2$ | $CO_2T$ | $CH_4$ | $N_2O$ | R | $CO_2e$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | | MT $CO_2e$ | | | | | | | | | |
| Off-Road | | | | | | | | | | | |
| Mobile | | | | | | | | | | | |
| Energy | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Area Source | | | | | | | | | | | |
| Water | | | | | | | | | | | |
| Solid Waste | 0.66 | 0 | 0.66 | 0.07 | 0 | 2.32 | | | | | |
| Refrig. | 0 | 0 | 0 | 0 | 0.005 | 0.005 | | | | | |
| Stationary Sources | | | | | | | | | | | |
| **Total** | **1** | **0** | **1** | **0** | **0** | **2** | | | | | |

# Darden Renewable Energy Project
# Construction CalEEMod
# Operational - GHG

**Road and Fence Repair**

| | $NBCO_2$ | $CO_2T$ | $CH_4$ | $N_2O$ | R | $CO_2e$ |
|---|---|---|---|---|---|---|
| Category | | | | | | MT $CO_2e$ |
| Off-Road | 29.3 | 29.3 | 0.005 | 0.005 | | 29.4 |
| Dust | | | | | | |
| On-Site Truck | 0 | 0 | 0 | 0 | 0 | 0 |
| Worker | 0.73 | 0.73 | 0.005 | 0.005 | 0.005 | 0.74 |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 |
| Hauling | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total** | **30.03** | **30.03** | **0.01** | **0.01** | **0.005** | **30.14** |

**Road Reconditioning**

| | $NBCO_2$ | $CO_2T$ | $CH_4$ | $N_2O$ | R | $CO_2e$ |
|---|---|---|---|---|---|---|
| Category | | | | | | MT $CO_2e$ |
| Off-Road | 128 | 128 | 0.01 | 0.005 | | 129 |
| Dust | | | | | | |
| On-Site Truck | 0 | 0 | 0 | 0 | 0 | 0 |
| Worker | 0.56 | 0.56 | 0.005 | 0.005 | 0.005 | 0.57 |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 |
| Hauling | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total** | **128.56** | **128.56** | **0.015** | **0.01** | **0.005** | **129.57** |

# Darden Renewable Energy Project
# Construction CalEEMod
# Operational - GHG

**Solar Panel Washing**

| | $NBCO_2$ | $CO_2T$ | $CH_4$ | $N_2O$ | R | $CO_2e$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | MT $CO_2e$ | | | | | | | | | | |
| Off-Road | 110 | 110 | 0.005 | 0.005 | | 111 | | | | | |
| Dust | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| On-Site Truck | | | | | | | | | | | |
| Worker | 12.5 | 12.5 | 0.005 | 0.005 | 0.02 | 12.7 | | | | | |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Hauling | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| **Total** | **122.5** | **122.5** | **0.01** | **0.01** | **0.02** | **123.7** | | | | | |

**Landscape Management**

| | $NBCO_2$ | $CO_2T$ | $CH_4$ | $N_2O$ | R | $CO_2e$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | MT $CO_2e$ | | | | | | | | | | |
| Off-Road | 516 | 516 | 0.02 | 0.005 | | 517 | | | | | |
| Dust | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| On-Site Truck | | | | | | | | | | | |
| Worker | 19 | 19 | 0.005 | 0.005 | 0.03 | 19.3 | | | | | |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Hauling | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| **Total** | **535** | **535** | **0.025** | **0.01** | **0.03** | **536.3** | | | | | |

## Darden Renewable Energy Project
## Construction CalEEMod
## Operational - GHG

**Hydrogen Facility**

| | $NBCO_2$ | $CO_2T$ | $CH_4$ | $N_2O$ | R | $CO_2e$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | MT $CO_2e$ | | | | | | | | | | |
| Off-Road | 0 | 0 | 0 | 0 | | 0 | | | | | |
| Dust | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| On-Site Truck | | | | | | | | | | | |
| Worker | 53.1 | 53.1 | 0.005 | 0.005 | 0.08 | 54 | | | | | |
| Vendor | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Hauling | 25.6 | 25.6 | 0.005 | 0.005 | 0.02 | 26.9 | | | | | |
| **Total** | **78.7** | **78.7** | **0.01** | **0.01** | **0.1** | **80.9** | | | | | |

### *Additonal Calcs*

Hydrolizer Waste

| days | $NBCO_2$ | $CO_2T$ | $CH_4$ | $N_2O$ | R | $CO_2e$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lbs/day | | | | | | | | | | |
| 1 | 734 | 734 | 0.02 | 0.02 | 2.57 | 743 | | | | | |
| 6 | 4404 | 4404 | 0.12 | 0.12 | 15.42 | 4458 | | | | | |
| MT/yr | 1.997619 | 1.997619 | 5.44E-05 | 5.44E-05 | 0.006994 | 2.0221131 | | | | | |

## Darden Renewable Energy Project
## Construction CalEEMod
## Operational - GHG

**Energy**

| | $NBCO_2$ | $CO_2T$ | $CH_4$ | $N_2O$ | R | $CO_2e$ | |
|---|---|---|---|---|---|---|---|
| Category | MT $CO_2e$ | | | | | | |
| General Office Building | | | | | | | Powered Onsite |
| Government Office Building | | | | | | | Powered from onsite |
| Other Non-Asphalt Surfaces[1] | | | | | | 141,951.29 | |
| | 140 | 140 | 0.02 | 0.005 | | 142 | |
| Refrigerated Warehouse-No Rail | | | | | | | Powered from Onsite |

[1] Note: The 142 MT CO2e was based on a usage of 1,515 MWH per year. Subsequent to the calculations the MWH/year was revised to 1,515480 MWH per year. GHG emissions were scaled to account for the increase in electrical consumption from the grid. (142*1515480)/1516 = 141,951.29 MT CO2e

**Stationary Source**

| | $NBCO_2$ | $CO_2T$ | $CH_4$ | $N_2O$ | R | $CO_2e$ |
|---|---|---|---|---|---|---|
| Category | lbs/day | | | | | |
| 1/2 hr;day | 3377 | 3377 | 0.14 | 0.03 | 0 | 3389 |
| 1 hr /day | 6754 | 6754 | 0.28 | 0.06 | 0 | 6778 |
| 100 hrs/yr | 675400 | 675400 | 28 | 6 | 0 | 677800 |
| **tons/year** | 306.356 | 306.356 | 0.012701 | 0.002722 | 0 | 307.44466 |

**Refrigerant**

| | $NBCO_2$ | $CO_2T$ | $CH_4$ | $N_2O$ | R | $CO_2e$ |
|---|---|---|---|---|---|---|
| Category | MT $CO_2e$ | | | | | |
| General Office Building | | | | | 0.005 | 0.005 |
| Government Office Building | | | | | 0.06 | 0.06 |
| Other Non-Asphalt Surfaces | | | | | | |
| Refrigerated Warehouse-No Rail | | | | | 17415 | 17415 |

## Darden Renewable Energy Project
## $SF_6$ Emissions Quantifications - Options 1 & 2

### *$SF_6$ Emissions Quantification Step-up Substation*

| | |
|---|---|
| 9 | HV circuit breakers (500 kV equipment) |
| 1,500 | *$SF_6$ max lbs/per circuit breaker* [1] |
| 1.00% | *$SF_6$ leakage percentage per year* [2] |
| 13,500 | *max lbs/project* |
| 135 | *$SF_6$ max lbs leakage per year* |
| 0.000454 | *lbs/MT* |
| 0.061235 | *$SF_6$ max MT leakage per year* |
| 24,600 | *GWP* |
| 1,506 | *Max MT $CO_2$e/year* |

1 Provided by Client

2 CARB 2020. *Public Hearing to Consider the Proposed Amendments to the Regulatoion for Reducing Sulfur Hexaflouride Emissions from Gas Insulated Switchgear. https://www.epa.gov/sites/production/files/2018-08/documents/12183_sf6_partnership_overview_v20_release_508.pdf. Accessed June 2022.*

### *$SF_6$ Emissions Quantification Utility Switchyard*

| | |
|---|---|
| 5 | HV circuit breakers (500 kV equipment) |
| 1,500 | *$SF_6$ max lbs/per circuit breaker* [1] |
| 1.00% | *$SF_6$ leakage percentage per year* [2] |
| 7,500 | *max lbs/project* |
| 75 | *$SF_6$ max lbs leakage per year* |
| 0.000454 | *lbs/MT* |
| 0.034019 | *$SF_6$ max MT leakage per year* |
| 24,600 | *GWP* |
| 837 | *Max MT $CO_2$e/year* |

**Darden Renewable Energy Project**

**$SF_6$ Emissions Quantifications - Alternative Hydrogen Facility**

***$SF_6$ Emissions Quantification - Alternate Green Hydrogen Substation***

| | |
|---|---|
| 9 | HV circuit breakers (500 kV equipment) |
| 1,500 | *$SF_6$ max lbs/per circuit breaker* [1] |
| 1.00% | *$SF_6$ leakage percentage per year* [2] |
| 13,500 | *max lbs/project* |
| 135 | *$SF_6$ max lbs leakage per year* |
| 0.000454 | *lbs/MT* |
| 0.061235 | *$SF_6$ max MT leakage per year* |
| 24,600 | *GWP* |
| 1,506 | *Max MT $CO_2e$/year* |

1 Provided by Client

2 CARB 2020. *Public Hearing to Consider the Proposed Amendments to the Regulatoion for Reducing Sulfur Hexaflouride Emissions from Gas Insulated Switchgear. https://www.epa.gov/sites/production/files/2018-08/documents/12183_sf6_partnership_overview_v20_release_508.pdf. Accessed June 2022.*

***$SF_6$ Emissions Quantification - alternate Green Hydrogen Switchyard***

| | |
|---|---|
| 3 | HV circuit breakers (500 kV equipment) |
| 1,500 | *$SF_6$ max lbs/per circuit breaker* [1] |
| 1.00% | *$SF_6$ leakage percentage per year* [2] |
| 4,500 | *max lbs/project* |
| 45 | *$SF_6$ max lbs leakage per year* |
| 0.000454 | *lbs/MT* |
| 0.020412 | *$SF_6$ max MT leakage per year* |
| 24,600 | *GWP* |
| 502 | *Max MT $CO_2e$/year* |

## Darden Renewable Energy Project

**Displaced Energy Production during 35-year Project life**

| Annual Energy Production | | Annual Average Solar Radiation Hours/Day/Year |
|---|---|---|
| Grid Size (MW) | 1150 | |
| Total hrs/year | 8,760 | |
| % Operational time [1] | *22%* | 5.38 |
| Operational hours/year | 1,964 | |
| KWh produced per year | 2,258,255,000 | |
| Assumed Heat Rate (Btu/KWh) | 10,000 | |
| Annual Fuel Equivalent (MMBtu)[2] | 22,582,550 | |

| CA Power Mix[3] | | Annual Fuel Displacement (MMBtu) |
|---|---|---|
| Coal[4] | 3.00% | 677,477 |
| Large Hydro | 9.20% | 2,077,595 |
| Natural Gas[4] | 37.90% | 8,558,786 |
| Nuclear | 9.30% | 2,100,177 |
| Oil | 0.00% | 0 |
| Other (petroleum coke/waste heat) | 0.20% | 45,165 |
| Renewables | 33.60% | 7,587,737 |
| Unspecified sources of Power | 6.80% | 1,535,613 |
| **Total** | **100.0%** | **22,582,550** |

**Annual Pollutant Displacement[4]**

***Natural Gas Turbine Emissions***

| Pollutant | AP-42 Emission Factor (lb/MMBtu)[5] | Controlled Emission Factor (lb/MMBtu) | Controlled Emissions (lb) | Controlled Emissions (ton) | AP-42 Emission Factor Source Notes[5] |
|---|---|---|---|---|---|
| $NO_2$ | 0.099 | 0.099 | 847,320 | 423.66 | Table 3.1-1, lean premix; Assume SCR Control Efficiency |
| CO | 0.015 | 0.015 | 128,382 | 64.19 | Table 3.1-1, lean premix; Assume Ox. Cat. Control Efficiency |
| $PM_{10}$ | 0.0047 | 0.0047 | 40,226 | 20.11 | Table 3.1-2a, PM (condensible) |
| $PM_{2.5}$ | 0.0019 | 0.0019 | 16,262 | 8.13 | Table 3.1-2a, PM (filterable) |
| $SO_2$ | 0.0034 | 0.0034 | 29,100 | 14.55 | Table 3.1-2a |
| $CO_2$ | 110 | 110 | 941,466,510 | 470,733.25 | Table 3.1-2a |

***Coal Combustion Emissions***

| Pollutant | AP-42 Emission Factor (lb/ton)[6] | Controlled Emission Factor (lb/ton) | Emissions (lb)[7] | Emissions (ton) | AP-42 Emission Factor Source Notes[6] |
|---|---|---|---|---|---|
| NOx | 12 | 12 | 338738 | 169.37 | Table 1.1-3 pulverized coal, wall fired, bituminous coal NSPS |
| CO | 0.5 | 0.5 | 14114 | 7.06 | Table 1.1-3 pulverized coal, wall fired, bituminous coal NSPS |
| $PM_{10}$[8] | 0.46 | 0.084 | 2371 | 1.19 | Table 1.1-4, PC-fired dry bottom wall-fired, scrubber control |
| $PM_{2.5}$[8] | 0.12 | 0.06 | 1694 | 0.85 | Table 1.1-4, PC-fired dry bottom wall-fired, scrubber control |
| $SO_2$[9] | 2.85 | 0.57 | 16090 | 8.05 | Table 1.1-3 pulverized coal, wall fired, bituminous coal NSPS |
| $CO_2$ | 6040 | 6040 | 170498253 | 85,249.13 | Table 1.1-20 |
| Total NMHC | 0.06 | 0.06 | 1694 | 0.85 | Table 1.1-19; assumed all hydrocarbons are reactive |
| $CH_4$ | 0.04 | 0.04 | 1129 | 0.56 | Table 1.1-19 |
| $N_2O$ | 0.03 | 0.03 | 847 | 0.42 | Table 1.1-19 |

***Total Displaced Emissions Associated With Direct Combustion***

| Pollutant | tons/year[8] | tons/lifetime (35 years) | | |
|---|---|---|---|---|
| ROG (NMHC) | 1 | 30 | | |
| $NO_X$ | 593 | 20,756 | | |
| CO | 71 | 2,494 | | |
| $PM_{10}$ | 21 | 745 | | |
| $PM_{2.5}$ | 9 | 314 | | |
| $SO_X$ | 23 | 791 | | |
| $CO_2E$ (Metric Ton) | 504,499 | 17,657,464 | 504,320.96 | 17651233.68 |

Notes:

1. Operational time is based on annual average solar radiation hours per day per year (5.38) for the project area. Source: solardirect.com (https://www.solardirect.com/archives/pv/systems/gts/gts-sizing-sun-hours.html)
2. The Project is assumed to displace existing power generation equivalent to the current power mix each year of operation.
3. CA Power Mix assumptions are based on data from the 2021 Total System Electric Generatin Table. https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/2020-total-system-electric-generation
4. Combustion of natural gas and coal for power are of the greatest concern related to the generation of criteria pollutants and GHG emissions, therefore only fuel displacement of natural gas and coal due to electricty production from the Solar Scarlet facility are considered in this assessment.
5. EPA Air Pollution Emission Factors AP-42 Section 3.1, Stationary Gas Turbines
6. EPA Air Pollution Emission Factors AP-42 Section 1.1, Bituminous and Subbituminous Coal Combustion
7. Coal characteristics used for conversion: Assumed coal heat content = 24 MMBtu/ton
8. Total particulate matter (CPM-TOT) is expressed in terms of coal ash content therefore emission factor is determined by multiplying % ash content of coal (assumed to be 20% herein) by value listed in Table 1.1-4. Organic fraction of particulate matter is 20% of total CPM-TOT (Table 1.1-5) and listed as controlled emission factor.
9. $SO_x$ emission factor calculated by multiplying the weight percent of sulfur (assumed to be 7.5%) by the value listed in Table 1.1-3
10. $CO_2E$ volumes are in metric tons rather than short (US) tons

## Darden Renewable Energy Project

**Displaced Energy Production during 35-year Project life (2023 CA Power Mix and Increased Renewable Accountability)**

| Annual Energy Production | | Annual Average Solar Radiation Hours/Day/Year |
|---|---|---|
| Grid Size (MW) | 1150 | |
| Total hrs/year | 8,760 | |
| % Operational time [1] | *22%* | 5.38 |
| Operational hours/year | 1,964 | |
| KWh produced per year | 2,258,255,000 | |
| Assumed Heat Rate (Btu/KWh) | 10,000 | |
| Annual Fuel Equivalent (MMBtu)[2] | 22,582,550 | |

| CA Power Mix[3] | | Annual Fuel Displacement (MMBtu) |
|---|---|---|
| Coal[4] | 1.77% | 399,711 |
| Large Hydro | 11.70% | 2,642,158 |
| Natural Gas[4] | 36.56% | 8,256,180 |
| Nuclear | 9.34% | 2,109,210 |
| Oil | 0.01% | 2,258 |
| Other (petroleum coke/waste heat) | 0.07% | 15,808 |
| Renewables | 36.86% | 8,323,928 |
| Unspecified sources of Power | 3.69% | 833,296 |
| **Total** | **100.0%** | **22,582,550** |

**Annual Pollutant Displacement[4]**

***Natural Gas Turbine Emissions***

| Pollutant | AP-42 Emission Factor (lb/MMBtu)[5] | Controlled Emission Factor (lb/MMBtu) | Controlled Emissions (lb) | Controlled Emissions (ton) | AP-42 Emission Factor Source Notes[5] |
|---|---|---|---|---|---|
| $NO_2$ | 0.099 | 0.099 | 817,362 | 408.68 | Table 3.1-1, lean premix; Assume SCR Control Efficiency |
| CO | 0.015 | 0.015 | 123,843 | 61.92 | Table 3.1-1, lean premix; Assume Ox. Cat. Control Efficiency |
| $PM_{10}$ | 0.0047 | 0.0047 | 38,804 | 19.40 | Table 3.1-2a, PM (condensible) |
| $PM_{2.5}$ | 0.0019 | 0.0019 | 15,687 | 7.84 | Table 3.1-2a, PM (filterable) |
| $SO_2$ | 0.0034 | 0.0034 | 28,071 | 14.04 | Table 3.1-2a |
| $CO_2$ | 110 | 110 | 908,179,831 | 454,089.92 | Table 3.1-2a |

***Coal Combustion Emissions***

| Pollutant | AP-42 Emission Factor (lb/ton)[6] | Controlled Emission Factor (lb/ton) | Emissions (lb)[7] | Emissions (ton) | AP-42 Emission Factor Source Notes[6] |
|---|---|---|---|---|---|
| NOx | 12 | 12 | 199856 | 99.93 | Table 1.1-3 pulverized coal, wall fired, bituminous coal NSPS |
| CO | 0.5 | 0.5 | 8327 | 4.16 | Table 1.1-3 pulverized coal, wall fired, bituminous coal NSPS |
| $PM_{10}$[8] | 0.46 | 0.084 | 1399 | 0.70 | Table 1.1-4, PC-fired dry bottom wall-fired, scrubber control |
| $PM_{2.5}$[8] | 0.12 | 0.06 | 999 | 0.50 | Table 1.1-4, PC-fired dry bottom wall-fired, scrubber control |
| $SO_2$[9] | 2.85 | 0.57 | 9493 | 4.75 | Table 1.1-3 pulverized coal, wall fired, bituminous coal NSPS |
| $CO_2$ | 6040 | 6040 | 100593969 | 50,296.98 | Table 1.1-20 |
| Total NMHC | 0.06 | 0.06 | 999 | 0.50 | Table 1.1-19; assumed all hydrocarbons are reactive |
| $CH_4$ | 0.04 | 0.04 | 666 | 0.33 | Table 1.1-19 |
| $N_2O$ | 0.03 | 0.03 | 500 | 0.25 | Table 1.1-19 |

***Total Displaced Emissions Associated With Direct Combustion***

| Pollutant | tons/year[8] | tons/lifetime (35 years (Static)) | tons/lifetime (35 years (Increased Renewable)) |
|---|---|---|---|
| ROG (NMHC) | 0 | 17 | |
| $NO_X$ | 509 | 17,801 | |
| CO | 66 | 2,313 | |
| $PM_{10}$ | 20 | 704 | |
| $PM_{2.5}$ | 8 | 292 | |
| $SO_X$ | 19 | 657 | |
| $CO_2E$ (Metric Ton) | 457,643 | 16,017,506 | 4,113,714 |

Notes:

1. Operational time is based on annual average solar radiation hours per day per year (5.38) for the project area. Source: solardirect.com (https://www.solardirect.com/archives/pv/systems/gts/gts-sizing-sun-hours.html)
2. The Project is assumed to displace existing power generation equivalent to the current power mix each year of operation.
3. CA Power Mix assumptions are based on data from the 2021 Total System Electric Generatin Table. https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/2023-total-system-electric-generation
4. Combustion of natural gas and coal for power are of the greatest concern related to the generation of criteria pollutants and GHG emissions, therefore only fuel displacement of natural gas and coal due to electricty production from the Solar Scarlet facility are considered in this assessment.
5. EPA Air Pollution Emission Factors AP-42 Section 3.1, Stationary Gas Turbines
6. EPA Air Pollution Emission Factors AP-42 Section 1.1, Bituminous and Subbituminous Coal Combustion
7. Coal characteristics used for conversion: Assumed coal heat content = 24 MMBtu/ton
8. Total particulate matter (CPM-TOT) is expressed in terms of coal ash content therefore emission factor is determined by multiplying % ash content of coal (assumed to be 20% herein) by value listed in Table 1.1-4. Organic fraction of particulate matter is 20% of total CPM-TOT (Table 1.1-5) and listed as controlled emission factor.
9. $SO_x$ emission factor calculated by multiplying the weight percent of sulfur (assumed to be 7.5%) by the value listed in Table 1.1-3
10. $CO_2E$ volumes are in metric tons rather than short (US) tons

## Darden Renewable Energy Project

### :d Energy Production during 35-year Project life (2023 CA Power Mix and Increased Renewable Accour

Offset based on Increased Renewable Percentage

| Year | Renewable % | Change in % | reduction per year | Non Renewable % | Total MT GHG | GHG per % |
|---|---|---|---|---|---|---|
| 2023 | 36.86% | | | 63.14% | 457,643 | 7248.068333 |
| 2024 | 40.17% | | | 59.83% | 433,683 | |
| 2025 | 43.47% | | | 56.53% | 409,723 | |
| 2026 | 46.78% | | | 53.22% | 385,763 | |
| 2027 | 50.08% | | | 49.92% | 361,803 | |
| 2028 | 53.39% | | | 46.61% | 337,843 | |
| 2029 | 56.69% | | | 43.31% | 313,883 | |
| 2030 | 60% | 23.1400% | 0.033057143 | 40.00% | 289,923 | |
| 2031 | 66.00% | | | 34.00% | 246,434 | |
| 2032 | 72.00% | | | 28.00% | 202,946 | |
| 2033 | 78.00% | | | 22.00% | 159,458 | |
| 2034 | 84.00% | | | 16.00% | 115,969 | |
| 2035 | 90% | 30% | 0.06 | 10.00% | 72,481 | |
| 2036 | 91.00% | | | 9.00% | 65,233 | |
| 2037 | 92.00% | | | 8.00% | 57,985 | |
| 2038 | 93.00% | | | 7.00% | 50,736 | |
| 2039 | 94.00% | | | 6.00% | 43,488 | |
| 2040 | 95% | 5% | 0.01 | 5.00% | 36,240 | |
| 2041 | 96.00% | | | 4.00% | 28,992 | |
| 2042 | 97.00% | | | 3.00% | 21,744 | |
| 2043 | 98.00% | | | 2.00% | 14,496 | |
| 2044 | 99.00% | | | 1.00% | 7,248 | |
| 2045 | 100% | 5% | 0.01 | 0.00% | 0 | |

*Beyond 2045 would be equalt to 2045

Total Offset over 35 years 4,113,714

# Appendix N-3

CalEEMod Output

# Appendix N-4

HRA Summary

# Appendix N-5

HARP Output

# Appendix N-6

AERMOD Output

# Appendix N-7

AAQA Summary