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California Energy Commission

Perkins Renewable Energy Project

CEC Data Request Response Set #1 for the Opt-in Application 24-OPT-01

July 2024

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California Energy Commission

Perkins Renewable Energy Project CEC Data Request Response Set #1 for the Opt-in Application 24-OPT-01

July 2024

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Table of Contents

TABLE OF CONTENTS

List of Tables

List of Figures

List of Attachments

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1 Introduction

1.1 Introduction to CEC Data Request Response Set #1

On March 28, 2024, IP Perkins, LLC, IP Perkins BAAH, LLC, and affiliates (Applicant) received a Determination of Incomplete Application and Request for Information from the California Energy Commission (CEC) for the Perkins Renewable Energy Project (24-OPT-01) in response to the Applicant's application filed on February 14, 2024. This document provides the Applicant's first set of responses to the Data Requests received from the CEC. Table 1 lists all Data Requests for which a response is provided in Response Set #1.

Table 1 Data Requests Included in Response Set #1

Data Request Resources Area	Data Request Number
Mandatory Opt-in Requirements	--
Air Quality	DR AQ-1 through DR AQ-11
Biological Resources	--
Cultural and Tribal Cultural Resources	--
Greenhouse Gas Emissions	DR GHG-1 through DR GHG-7
Hazardous Materials Handling	DR HAZ-1 through DR HAZ-5
Land Use	DR LAND-1 through DR LAND-7
Noise	DR NOISE-1 and DR NOISE-2
Project Description	DR PD-1 through DR PD-5
Public Health	DR PH-1 through DR PH-3
Socioeconomics	DR SOCIO-1 through DR SOCIO-7
Traffic and Transportation	DR TRANS-1 through DR TRANS-6
Transmission System Design	--
Visual Resources	DR VIS-1 through DR VIS-7
Water Resources	--
Worker Safety	DR WS-1 through DR WS-5

The responses are grouped by individual discipline or topic area and are presented in the same order and with the same numbering provided by the CEC. New or revised graphics, tables, or attachments are provided throughout this document and as attachments to this document. The responses included in this document are considered complete responses to the corresponding individual Data Requests.

Table 2 provides a list of all remaining Data Requests received from the CEC that have not been addressed in Response Set #1.

Table 2 Data responses Not Included in Response Set #1

Data Request Resource Area	Data Request Number
Mandatory Opt-in Requirements	DR MAND-1 through DR MAND-4
Biological Resources	DR BIO-1 through DR BIO-32
Cultural and Tribal Cultural Resources	DR CUL/TRI-1 through DR CUL/TRI-20
Transmission System Design	DR TSD-1 through DR TSD-5
Water Resources	DR WATER-1 through DR WATER-5

Supplemental Data Request response sets will be provided to the CEC in response to the Data Requests not addressed in this document.

2 Air Quality

2.1 Data Request AQ-1

DR AQ-1: Please provide copies of all substantive correspondence between the applicant and the District regarding the project, including applications and emails, within one week of submittal or receipt. This request remains in effect until staff publishes the environmental document.

Response: Emails and correspondence with Imperial County Air Pollution Control District (ICAPCD) to date are provided in Attachment A.1 to this Response Set #1 and were provided previously to the CEC on June 3, 2024. If the Project were not completing the Opt-in Certification, the project would require an authority to construct and a permit for operation of the emergency generator. Future correspondence with ICAPCD regarding the project will be provided to CEC within one week of submittal or receipt.

The Air Quality Technical Report (Attachment A.2 to this Response Set #1) includes updated analysis, project design features (PDF), and mitigation measure language for consistency with ICAPCD approach to technical analysis of fugitive dust emissions during construction and NOx during operation such as would be required if the ICAPCD were issuing a permit for construction. The Air Quality Technical Report was revised based in part on the meeting with the ICAPCD to fulfill their requirements and following their methodology for analysis. Example mitigation measures and PDF language was shared with the ICAPCD to ensure they agreed with the requirements. The mitigation measure and PDF language for air quality included in the revised Air Quality Technical Report (Attachment A.2 to this Response Set #1) supersedes the air quality PDFs and mitigation measures previously provided in the Opt-in Application (February 2024). The revised PDF language and mitigation measures are also provided below in Table 3.

Table 3 Revised Project Design Features and Mitigation Measures

No.	Description of Measure	Phase
PDF AQ-1	**Fugitive Dust Control Plan.** The project owner or owner's contractor shall prepare and implement a Fugitive Dust Control Plan to reduce fugitive dust emissions during project construction. The project owner shall maintain and implement equivalent fugitive dust control strategies during operation, maintenance, and decommissioning. The plan would apply to activities including, but not limited to, development of laydown and staging areas, site grading, vegetation management, and installing all project facilities through post-construction cleanup. The project owner or owner's contractor shall take every reasonable precaution to prevent all airborne fugitive dust plumes from leaving the project site and to prevent visible particulate matter from being deposited upon public roadways, as specified below. Where specified	C, O, D

below, loose materials and soils shall be stabilized with a non-toxic soil stabilizer or soil weighting agent or watered two times daily or as frequently as necessary to minimize fugitive dust generation. Non-water-based soil stabilizers shall be as efficient as or more efficient for fugitive dust control than CARB-approved soil stabilizers and shall not increase any other environmental impacts, including loss of vegetation, adverse odors, or emissions of ozone precursor reactive organic gases (ROG) or volatile organic compounds (VOC).

Prior to any earthmoving activity, the Fugitive Dust Control Plan shall be submitted to the CEC for review and approval to ensure compliance with the standards in ICAPCD Rule 801, Section F, Best Available Control Measures for Fugitive Dust, and recordkeeping requirements in ICAPCD Rule 801, Section G, Record of Control Implementation. Records shall be readily accessible for two years after the date of each entry and shall be provided to the lead agency and/or ICAPCD upon request.

The following control measures would be included within the plan:

- All disturbed areas, including bulk material storage which is not being actively utilized, shall be effectively stabilized and visible emissions shall be limited to no greater than 20 percent opacity for dust emissions by using water, chemical stabilizers, dust suppressants, tarps or other suitable material such as vegetative ground cover.
- All on site unpaved roads will be effectively stabilized and visible emissions shall be limited to no greater than 20 percent opacity for dust emissions by paving, chemical stabilizers, dust suppressants and/or watering.
- All unpaved traffic areas one (1) acre or more with 75 or more average vehicle trips per day will be effectively stabilized and visible emissions shall be limited to no greater than 20 percent opacity for dust emissions by paving, chemical stabilizers, dust suppressants and/or watering.
- The transport of bulk materials shall be completely covered unless six inches of freeboard space from the top of the container is maintained with no spillage and loss of bulk material. In addition, the cargo compartment of all haul trucks is to be cleaned and/or washed at delivery site after removal of bulk material.
- All track-out or carry-out will be cleaned at the end of each workday or immediately when mud or dirt extends a cumulative distance of 50 linear feet or more onto a paved road.
- Movement of bulk material handling or transfer shall be stabilized prior to handling or at points of transfer with application of sufficient water, chemical stabilizers or by sheltering or enclosing the operation and transfer line.
- Temporary unpaved roads shall be effectively stabilized, and visible emissions shall be limited to no greater than 20 percent opacity for dust emission by paving, chemical stabilizers, dust suppressants and/or watering.
- All unpaved roads, disturbed areas (e.g., areas of scraping, excavation, backfilling, grading, and compacting), and loose materials generated during project activities shall be watered as frequently as necessary to minimize fugitive dust generation. In water-deprived locations, water spraying shall be limited to active disturbance areas only and non-water-based dust control measures shall be implemented in areas with intermittent or non-heavy use, such as stockpiles or access roads.
- Replace or revegetate ground cover in disturbed areas as quickly as possible.
- Install automatic sprinkler systems on soil piles, if visible dust emissions are observed.
- Vehicle speed for all construction vehicles shall not exceed 15 mph on any unpaved surface at the construction site.
- Vehicle travel shall be minimized through a trip reduction plan to achieve a target of 2 occupants per vehicle for construction employees.

	• Implement a shuttle service to and from retail services and food establishments during lunch hours. Construction operations shall cease when wind speeds (not gusts) exceed 25 mph until the wind speeds reduce for one hour below 25 mph.	
PDF AQ-2	**Control On-Site Off-Road Equipment Emissions.** The Project owner, its contractor, and its subcontractors, when entering into construction contracts or when procuring off-road equipment or vehicles for on-site construction or O&M activities, shall ensure that the following measures are included within contract or procurement specifications: • All construction diesel engines not registered under California Air Resources Board's Statewide Portable Equipment Registration Program, with a rating of 50 hp or higher shall meet the Tier 4 California Emission Standards for Off-Road Compression-Ignition Engines, as specified in California Code of Regulations, Title 13, section 2423(b)(1), unless a good faith effort demonstrates that such engine is not available for a particular item of equipment. In the event that a Tier 4 engine is not available for any off-road equipment larger than 50 hp, a Tier 3 engine shall be used or that equipment shall be equipped with retrofit controls to reduce exhaust emissions of nitrogen oxides (NOx) and diesel particulate matter (DPM) to no more than Tier 3 levels unless certified by the engine manufacturers that the use of such devices is not practical for specific engine types. • The contractor shall provide equipment logs demonstrating Tier level compliance for all off-road diesel equipment and registration of portable diesel equipment. • All diesel-fueled engines used in the construction of the facility shall have clearly visible tags showing that the engine meets the standards of this measure. Records of inspections of visible tags shall be maintained and readily accessible for two years after the date of each entry and shall be provided to the lead agency and/or ICAPCD upon request. • All equipment and trucks used in the construction or O&M of the facility shall be properly maintained and the engines tuned to the engine manufacturer's specifications. • All diesel heavy construction equipment shall not idle for more than five minutes. Vehicles that need to idle as part of their normal operation (such as concrete trucks) are exempted from this requirement. Diesel and gasoline-fueled equipment shall be replaced with electrically driven equivalents, provided they are not run via a portable generator set, where practical.	C, O, D
PDF AQ-3	**Dust Suppression.** The project applicant shall employ a method of dust suppression (such as water or chemical stabilization) approved by CEC, BLM, RWQCB, and ICAPCD. The project applicant shall apply chemical stabilization as directed by the product manufacturer to control dust between the panels, and other non-used areas (exceptions will be the paved entrance and parking area, and Fire Department access/emergency entry/exit points as approved by CEC in coordination with Imperial County Fire/Office of Emergency Services [OES] Department).	
PDF AQ-4	**Dust Suppression Management Plan.** Prior to any earthmoving activity, the applicant shall submit a construction dust control plan and obtain CEC and BLM concurrence.	
MM AIR-1	**NOx Mitigation:** Before starting onsite construction activities, the Project Applicant shall submit a Construction Emissions Monitoring Plan (Plan) describing how the Project sponsor will track the actual hours of equipment use for each piece of off-road equipment during each phase of construction. A summary report of the off-road equipment use shall periodically be submitted to the CEC for review and shared with the ICAPCD. The summary report shall include, but is not limited to, the equipment type, equipment manufacturer, engine certification (Tier rating), horsepower, fuel type, and actual hours of operation. The frequency of summary	C, O, D

report submittals shall be identified in the Plan as determined between the CEC and the Applicant.

If the CEC determines that the Project's actual NOx emissions during construction exceed the recommended threshold of significance, then the Applicant shall be required to comply with ICAPCD Policy Number 5, "Off-site Mitigation/In-lieu Fee". Policy Number 5 requires the Applicant to prepare and implement the following measures, as approved by the CEC, to reduce construction emissions of NOx below the threshold of significance:

1. Propose an off-site mitigation project providing supporting documentation that the reductions are met, or
2. Pay an in-lieu mitigation fee in accordance with the ICAPCD's Off-Site Mitigation/In-Lieu Fee Policy.

2.2 Data Request AQ-2

DR AQ-2: Please provide a completeness determination letter from the ICAPCD confirming that the application submitted to the District has been deemed complete.

Response: Pursuant to Public Resources Code section 25545.1(b), "issuance of a certificate by the commission for a site and related facility pursuant to this chapter shall be in lieu of any permit, certificate, or similar document required by any state, local, or regional agency, or federal agency," except for the State Lands Commission, the California Coastal Commission, the San Francisco Bay Conservation and Development Commission, the State Water Resources Control Board, or the applicable regional water quality control boards. The ICAPCD is not one of the enumerated agencies and the permits required here are not Title V permits; therefore, any local air quality permit would be subsumed in the CEC's certification.

The permits ICAPCD would be responsible for with the Project, absent CEC jurisdiction, would be the authority to construct and the emergency generator permit. For the authority to construct, as noted above in Data Response AQ-1, the revised Air Quality Technical Report addresses all the items requested by the ICAPCD and include mitigation to address any potential concerns highlighted by the ICAPCD.

Per discussions with the CEC and the ICAPCD, the Applicant will submit the draft air permit application package to ICAPCD, which will provide a determination of completeness or engineering evaluation with conditions for the CEC to incorporate into its certification. The Applicant is committed to using a propane generator rather than a diesel generator. However, the Project's air quality report assumes in its analysis a diesel generator to provide a conservative analysis, as the modeled emissions from the diesel generator exceed those which would be emitted by any propane generator installed for the Project. The diesel generator included in the air quality report also is modeled in the same location where the propane generator will be installed. Thus, the air quality report provides complete information for analyzing air quality impacts, concluding that the modeled diesel generator and other operational emissions would not exceed any ICACPD operational pollutant thresholds and, therefore, would not result in a cumulatively considerable net increase in any criteria pollutant for which the region is in nonattainment.

The exact type of propane emergency generator that will be used for the Project has not been selected, but the applicant will continue to coordinate with the ICAPCD to determine the information necessary for its review during the CEQA process so that necessary conditions of approval can be included in CEC's certification. The applicant will provide to the CEC any application materials submitted to the ICAPCD, and as noted above, will provide copies of all correspondence with the ICAPCD.

2.3 Data Request AQ-3

DR AQ-3: Please provide the manufacturer's specification sheets for the emergency diesel generator, which would show emission levels and exhaust parameters of the emergency diesel generator.

Response: The back-up generator is proposed to be a liquified petroleum gas (LPG) propane generator as opposed to a diesel generator. Diesel is no longer being considered as a potential fuel source for the emergency back-up generator. The emergency back-up generator is not intended for normal operations. It would be used in case of an emergency power supply failure to ensure safe and reliable power for the control room of the Supervisory Control and Data Acquisition (SCADA) system and Project substation controls. This would occur only during blackout and brownout situations on the local distribution network, which are exceedingly rare.

Please see the attached specification sheet for an example LPG-fired backup emergency generator that could be used on site. The Applicant has employed this type of generator on operational projects in Riverside County and similar technology would be used for the Perkins Renewable Energy Project. Two generators producing up to 150 kilowatts (kW) each for a total of up to 300 kW will be required due to the size of the Perkins substation and back-up power requirements. Spec sheets for representative models that may be selected upon final engineering are included in an attachment.

Emissions information for the LPG generator can be found on pages 13 to 17 of the specification sheet (Attachment A.3 to this Response Set #1).

2.4 Data Request AQ-4

DR AQ-4: Please provide the ambient concentrations of all criteria pollutants relevant to the project, i.e., ozone, PM_{10}, $PM_{2.5}$, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), from the past three years, as recorded by the three Air Resources Board-certified monitoring stations nearest to the project site.

Response: The Air Quality Technical Report and Air Quality section of the Opt-in Application included ambient concentrations of particulate matter 10 microns or smaller (PM_{10}), particulate matter 2.5 microns or smaller ($PM_{2.5}$), and ozone at the Calexico-Ethel Street station located 16 miles southwest of the Project site and El Centro – 9th Street station located approximately 20 miles northwest of the Project site. The Brawley station is the third closest monitoring station to the Project site, but the station has been closed since 2009 and therefore no data is available for the last 3 years. The fourth closest station, Westmorland, is about 35 miles northwest of the Project site and is not considered representative of the Project site conditions due its distance and location near the Salton Sea.

Data on CO, NO_2, and SO_2 were not provided because there are no SO_2, NO_2, or CO data collected at nearby monitoring stations. The area is in attainment or unclassified for these pollutants.

2.5 Data Request AQ-5

DR AQ-5: Please provide an analysis, such as a comparison of emission sources near the monitoring stations and near the project site, to determine if this ambient criteria pollutant data accurately represents conditions at the project site.

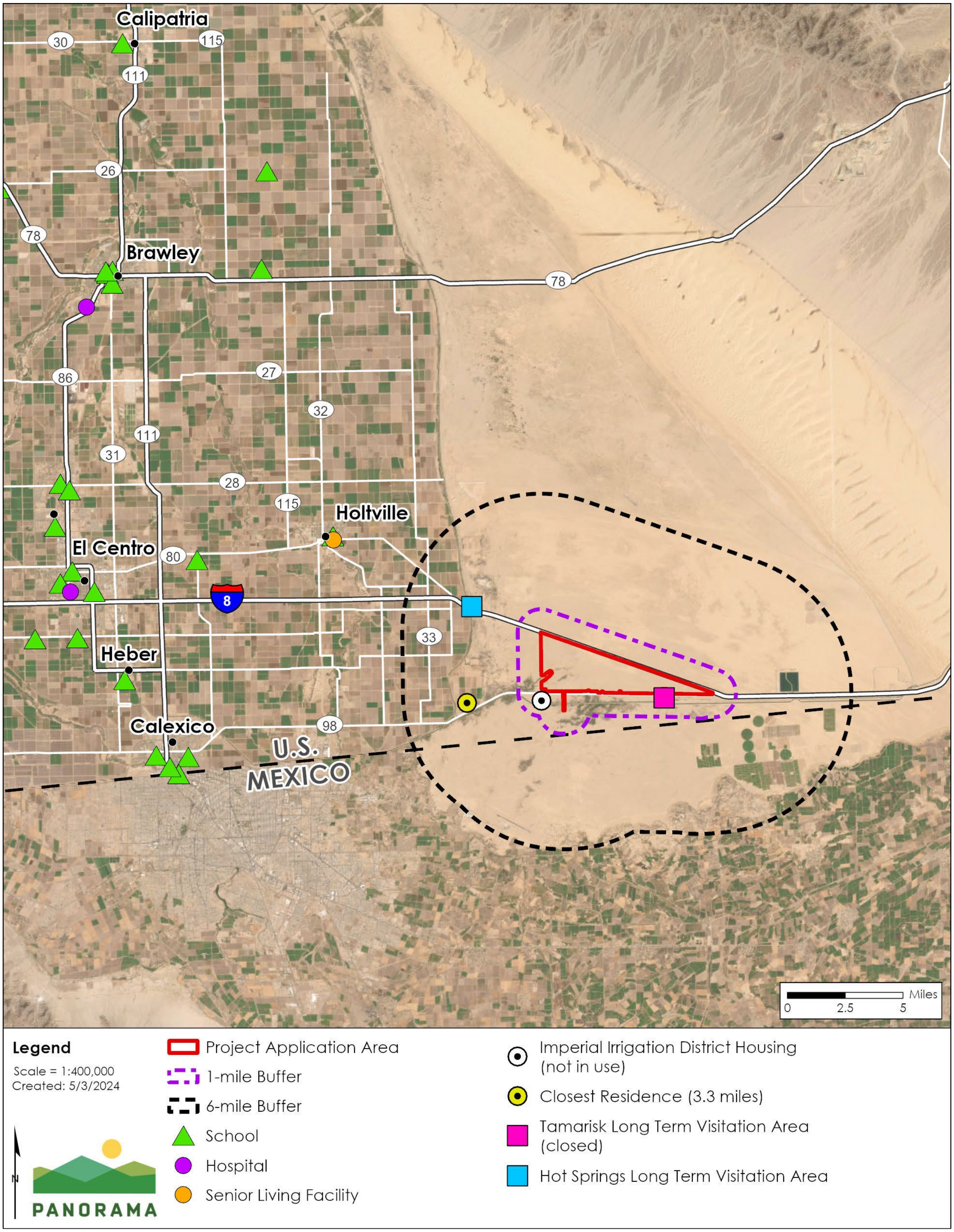
Response: Table 5 in the Air Quality Technical Report (Attachment A.2 to this Response Set #1) includes a comparison of the measured pollutant concentrations at the nearby monitoring stations with applicable State and federal ambient air quality standards. As shown in Table 5 of the Air Quality Technical Report, the ozone concentrations are relatively similar at both the El Centro and Calexico monitoring stations; however, the PM_{10} and $PM_{2.5}$ concentrations are substantially higher at the Calexico station than the El Centro Station. This is because the city of Calexico shares a border with the densely populated city of Mexicali, Mexico, whose metropolitan area has more than five times the population of Imperial County. Both the Project site and the El Centro station are located about 10 miles away from the city of Mexicali; and after review of all the nearby stations, based on expert opinion, the ambient criteria air pollutant data collected at the El Centro station are representative of the Project site conditions.

2.6 Data Request AQ-6

DR AQ-6: Please provide the meteorological data that includes quarterly wind tables and wind roses, ambient temperatures, relative humidity, stability and mixing heights, upper atmospheric air data, and an analysis of whether this data is representative of conditions at the project site.

Response: The nearest sensitive receptor that could be exposed to criteria air pollutants generated by the Project is a residence located approximately 3.3 miles to the west of the Project as shown in Figure 1, below. As indicated in the Application, the Tamarisk Long Term Visitation Area (LTVA) has been closed by the Bureau of Land Management (BLM), and the former Imperial Irrigation District (IID) worker housing near the Project is no longer in use and does not house any sensitive receptors. The Hot Springs Long Term visitation area is an estimated 3.3 miles west of the project site. Due to the absence of sensitive receptors within 3 miles of the project, screening level modeling analysis of criteria air pollutants generated during Project construction and operation was conducted using the U.S. EPA's AERSCREEN dispersion model (Attachment A.2; Attachment A to this Response Set #1). Because AERSCREEN applies a theoretical worst-case scenario for meteorological conditions (i.e., wind speed, wind direction, temperature, and atmospheric stability) to conservatively estimate pollutant concentrations, the use and analysis of local meteorological data was not required.

Figure 1 Sensitive Receptors in Proximity to the Project



2.7 Data Request AQ-7

DR AQ-7: Please provide the complete CalEEMod results that cover all criteria pollutants including NOx, SO_2, CO, PM_{10}, and $PM_{2.5}$ during the construction and operation phase.

Response: As confirmed in the call held with the CEC on April 25, 2024, the CEC already received the CalEEMod results in Appendix B of Appendix H, Air Quality Technical Report, and no additional modeling results are required.

2.8 Data Request AQ-8

DR AQ-8: Please provide an ambient air quality impacts analysis of all criteria pollutant concentrations including NOx, SO_2, CO, PM_{10}, and $PM_{2.5}$ using a dispersion model such as AERMOD during construction and operation and compare these concentrations with the thresholds for state and federal AAQS.

Response: As discussed in response to Data Request AQ-6, there are no sensitive receptors within 3 miles of the Project site. An AERSCREEN analysis was completed for the Project construction and operation and the results are contained in Attachment A.2 to this Response Set #1. As shown in Table 14 of Attachment A.2, the estimated concentrations of NOx, SO_2, CO, PM_{10}, and $PM_{2.5}$ at the nearest sensitive receptor during Project construction and operation would be below the California Ambient Air Quality Standards and National Ambient Air Quality Standards thresholds.

2.9 Data Request AQ-9

DR AQ-9: Please provide the location and specifications of the proposed backup generator, which shall be incorporated into the dispersion model as a point source.

Response: The emergency back-up generator will be located within or immediately adjacent to the proposed on-site substation. See Figure 2.3-1 and 2.3-2 in the Opt-in Application for the location of the substation. Operation emissions were modeled in AERSCREEN as a volume source located at the operation and maintenance yard/facility, assuming the use of a diesel (rather than propone) generator, which provides a conservative emissions scenario (Attachment A.2 to this Response Set #1). The emissions from annual maintenance and testing of the emergency propane generator were not modeled as a separate point source, because the emissions account for about 5 percent or less of the total emissions for each criteria air pollutant.

2.10 Data Request AQ-10

DR AQ-10: Please provide justification regarding whether a cumulative air quality impacts modeling analysis is needed. If yes, please submit a modeling protocol for assessing the cumulative air quality impacts of the project during its standard operational phase in combination with other stationary emissions sources within a 6-mile radius that have received construction permits but are not yet operational or are in the permitting process.

Response: There are two cumulative projects located within a 6 miles radius of the Project Application Area that have pending entitlements:

- The VEGA SES 4 Solar Energy Project (4.0 miles to the southwest)
- Viking Solar Energy Generation and Battery Storage Project (4.5 miles to the northwest)

As described in Section 4.1 of the Opt-In Application, the Project's operational emissions would be well below ICAPCD thresholds for all criteria air pollutants and, therefore, would not result in a cumulatively considerable net increase in any criteria pollutant for which the region is in nonattainment. The projects noted above are similar in type to the Perkins Project but are smaller than the Project. Given these characteristics, these projects would likely result in similar if not fewer operational emissions than the Project, also below ICAPCD thresholds. Further, neither of these projects propose to operate a stationary source (e.g., emergency generator) which would produce additional emissions. Air pollution is largely a cumulative issue as air pollutants from individual projects contribute to the cumulative sum of total air pollutants in the ICACPD. Based on ICACPD's CEQA Air Quality Handbook (ICAPCD [1993] 2017), a project would have a significant cumulative impact if it were to exceed the operational emission thresholds. As the Project would not exceed these thresholds, and the projects within 6 miles likely would result in fewer emissions compared to the Project, cumulative impacts from operation would be less than significant, and a modeling protocol for assessing cumulative air quality impacts during the operational phase is not required.

2.11 Data Request AQ-11

DR AQ-11: Appendix E.2 lists the steps the applicant intends to follow to secure the necessary permits. Please provide a planned schedule of when these permit applications would be submitted and when these permits would be obtained.

Response: The permit table provided in Appendix E.2 has been updated to include an estimated schedule for obtaining the permits, see Attachment B to this Response Set #1.

3 Greenhouse Gas Emissions

3.1 Data Request DR GHG-1

DR GHG-1: Explain how the proposed installation of a backup generator at the project site is consistent with the State of California's goal of achieving carbon neutrality no later than 2045.

Response: Since providing the Opt-in Application for the Perkins Renewable Energy Project, the Applicant has revised the project to include LPG as the proposed fuel for the backup generator and diesel would not be used. Dedicated propane generators produce 11 to 13 percent less carbon dioxide compared with a diesel generator[1]. The backup generator would be limited to emergency use only as the Project is going to have a distribution grid hookup for general electricity needs. The small amount of greenhouse gases created by emergency use of a propane backup generator would be more than offset by the amount of renewable energy created by the Project. The Project as a whole is consistent with the State of California's goal of achieving carbon neutrality no later than 2045 and directly contributes to this goal.

3.2 Data Request DR GHG-2

DR GHG-2: What other technologies or fuel alternatives to diesel for the backup generator have you explored and why were they not pursued?

Response: The original application dated February 14, 2024, included diesel and propane as optional fuels for the emergency generator. A diesel backup generator is no longer being considered by the Applicant. Since the original application, the Applicant has committed to using LPG (propane) as the fuel source for the backup generator. Dedicated propane generators produce 11 to 13 percent less carbon dioxide compared with a diesel generator. As noted previously, the backup generator will not be used for normal operations. It is included in the design to address emergency power supply failures and ensure safe and reliable backup power for the control room of the SCADA system and Project substation in the event of a distribution power outage. Given the emergency-only usage of the generator, no other alternative technology would be feasible in this capacity.

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[1] Non-propane generators that are retrofitted to run on propane result in a reduction in particular matter and NOx, but do not reduce carbon dioxide. However, dedicated propane generators do reduce carbon dioxide emissions as noted above. *Power Generation: The Emissions Shifting Problem* (March 2022).

3.3 Data Request DR GHG-3

DR GHG-3: Has the project applicant explored the procurement of renewable diesel and/or carbon offsets as a means of demonstrating consistency with the State of California's goal of carbon neutrality? If not, why not?

Response: LPG (propane) is the proposed fuel source for the backup generator which has fewer emissions than diesel backup generators. Renewable diesel is not being considered as a backup generator fuel source because of the newness of the technology and limited availability. Because the Project as a whole will result in substantial net carbon reductions, carbon offsets are not being considered for the very limited, emergency-only operations of the generator. The Project's generation of carbon-free electricity will more than offset, by many orders of magnitude, any emissions associated with the very rare, emergency-only operation of the propane fueled backup generator. For example, the U.S. Energy Information Administration identified an average of 202 minutes (less than 4 hours) of system interruptions in California in 2022[2].

3.4 Data Request DR GHG-4

DR GHG-4: Please confirm which of the four provisions the applicant would rely upon to comply with the current SF_6 phase-out regulation. If the project would not qualify for the exemption, please propose an alternative to SF_6.

Response: The Applicant would elect Option 3 as the SF_6 gas insulated equipment (GIE) device was purchased by the GIE owner prior to the applicable phase-out date listed for the relevant GIE characteristics and enters California no later than 24 months after the purchase date.

The 500kV circuit breakers are the only Perkins proposed equipment containing SF_6 gas. Currently, SF_6 is the only interrupting medium that is utilized in 500kV circuit breakers and no commercially viable alternative exists (or is expected to be available by the time the project comes online) for SF_6 as an interrupting medium that is accepted by California utilities. While research and development is being conducted by several manufacturers to produce SF_6-free circuit breakers, none currently have commercially available products suited for 500kV applications.

3.5 Data Request DR GHG-5

DR GHG-5: If the applicant is going to use Option 3 of the provisions shown above, please provide the voltage capacity and short-circuit current rating of the proposed circuit breakers and gas-insulated switchgear and applicable phase-out date. Please confirm whether the

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[2] U.S. Energy Information Administration, Form EIA-861, Annual Electric Power Industry Report.

proposed circuit breakers and gas-insulated switchgear would be purchased prior to the applicable phase-out date and enter California no later than 24 months after the purchase date.

Response: The voltage capacity of the proposed circuit breakers and gas-insulated switchgear is 500 kV, and the short circuit rating of the proposed breakers is 63KA. According to Table 2 referenced in the data request, the phase-out date for breakers greater than 245kV is January 1, 2033. The Project's circuit breakers and gas-insulated switchgear would be purchased prior to this phase out date.

3.6 Data Request DR GHG-6

DR GHG-6: Please provide the loss in round-trip efficiency for the charging/discharging cycle, and the GHG emission intensity factor during charging.

Response: There would be a 1.4 percent loss in real power between the medium voltage (MV) substation and the low voltage terminals of the inverter, and an 8 percent reactive power loss between the MV substation and the low voltage terminals of the inverter. The loss between MV substation and Point of Interconnection shall not exceed 0.8 percent real power and 8 percent reactive power. These losses shall be in addition to the Round-trip Efficiency (RTE) of the batteries themselves, which will reduce as the batteries are cycled. The RTE at beginning of the battery life is between 89 and 90 percent.

Energy produced by the solar facility may be dispatched onto the electric grid, stored in the Battery Energy Storage System (BESS), or both. The BESS may also be charged by the grid. A metering system would be employed to measure how much energy stored in the BESS is derived from the grid versus the solar facility.

The average loss in RTE for the life of the BESS is 13 percent. Assuming the 4,600 megawatt-hour (MWh) BESS completes 1 full cycle per day and is wholly grid charged, this would require approximately 4.2 hours of charging at full capacity per day and results in approximately 251,000 MWh of lost RTE per year:

$$(4600 / (1 - 13\%) - 4600) * 365 = 250{,}885 \text{ MWh}$$

3.7 Data Request DR GHG-7

DR GHG-7: Please clarify whether GHG emissions will be associated with the BESS cooling. If emissions are expected, please provide the estimated amounts of these GHG emissions.

Response: The thermal management (heating/cooling) for the BESS is included along with the RTE. There is not a separate aux power connection to power the thermal loads, hence the value provided for charging/discharge includes the BESS cooling.

4 Hazardous Materials Handling

4.1 Data Request DR HAZ-1

DR HAZ-1: For Table 4.5-1, please provide the quantity of lithium that would be present onsite for the BESS based on the Project Description (Section 2.3, p. 2.3- 15), which includes several different lithium battery chemistries.

Response: Based on a typical battery design, the weight of the metal oxide in the lithium batteries could vary between a total of 7,379 tons to 14,757 tons, depending on the final size of the BESS. Table 4.5-1 and 4.5-2 have been updated to show these quantities, see Table 4 and Table 5, below. It should be noted that Table 4 and Table 5 have also been updated to delete diesel as an option for the backup generator, as the Project would install a propane generator.

Table 4 Use and Location of Hazardous Materials

Chemical Name	Use/Purpose	Quantity	Storage Location	State	Type of Storage Container	Project Phase
Cleaning chemicals/ detergents	Cleaning	Not available (NA)	O&M Building	Liquid	Cans, buckets	Construction and/or O&M
Paint	Construction and O&M	NA	O&M Building	Liquid	Cans, buckets	Construction and/or O&M
Diesel <u>(if needed for vehicle refueling)</u>	O&M	400 gallons	Above ground storage tank (AST) ~~for backup generator~~	Liquid	AST	O&M
Propane	Construction <u>and O&M</u>	1,600 gallons	O&M Building	Gas	Pressurized tank	Construction
Adhesives	Construction and O&M	NA	O&M Building	Liquid, Solid	Bottles	Construction and/or O&M
Sealants	Construction and O&M	NA	O&M Building	Liquid	Bottles	Construction and/or O&M
Hydraulic fluids/GSU	O&M	480,000 gallons	Transformers	Liquid	Cans, ASTs	O&M
Hydraulic fluids/MVT	O&M	575,000 <u>gallons</u>	Transformers	Liquid	Cans, ASTs	O&M

Sulfur hexafluoride	O&M	620 gallons	High voltage breakers	Gas	Cylinders	O&M
Sulfuric acid	O&M	690 gallons	Battery cells	Liquid	In cells	O&M
Ethylene glycol solution	O&M - BESS	NA	BESS	Liquid	NA	O&M
1,1,1,2-tetrafluororethane	O&M - BESS	NA	BESS	Gas	Cylinders	O&M
Gasoline	Fueling equipment	1,800 gallons	Flammables storage locker outside O&M Building	Liquid	Cans	Construction
Coolant	Construction and O&M	50 gallons	NA	Liquid	Cans	Construction and/or O&M
Lithium-ion batteries (lithium ion, lithium iron phosphate, lithium nickel manganese cobalt, or lithium nickel cobalt aluminum)	Construction and O&M	7,349 - 14,757 tons	Energy storage	Solid	NA	Construction and/or O&M

Table 5 Chemical Inventory, Description of Hazardous Materials On-site, and Reportable Quantities

Trade name	Chemical name	CAS no.	Maximum quantity on site	CERCLA SARA RQ [1]	RQ of material as used on site [2]	HS TPQ [3]	Regulated substance TQ [4]	Prop 65 [5]
Cleaning chemicals/ detergents	Various	Various	Not available (NA)	nil	nil	nil	nil	No
Paint	Various	Various	NA	nil	nil	nil	nil	No
Diesel (if needed for vehicle refueling)	Diesel	68476-34-6	2,000 gallons	nil	nil	nil	nil	No
Propane	Propane	74-98-6	1,600 gallons	nil	nil	nil	nil	No
Adhesives	Various	Various	NA	nil	nil	nil	nil	No
Sealants	Various	Various	NA	nil	nil	nil	nil	No

Hydraulic fluid (FR3 natural ester fluid)	FR3	None	427,380 gallons	42 gallons [e]	42 gallons [e]	nil	nil	No
Sulfur hexafluoride (SF6)	Sulfur hexafluoride	2551-62-4	620 gallons	nil	nil	nil	nil	No
Electrolyte	Sulfuric acid	7664-93-9	690 gallons	1,000 lbs.	3,333 lbs.	1,000 lbs.	1,000 lbs.	Yes
Ethylene glycol solution	Ethylene glycol solution	107-21-1	NA	nil	nil	nil	nil	Yes
1,1,1,2-tetrafluororethane	1,1,1,2-tetrafluororethane	811-97-2	NA	nil	nil	nil	nil	No
Gasoline	Gasoline	8006-61-9; 86290-85-1	50 gallons	nil	nil	nil	nil	No
Coolant	Various	Various	50 gallons	nil	nil	nil	nil	No
Lubricants	Oil	None	NA	42 gallons [e]	42 gallons [e]	nil	nil	No
Lithium batteries (lithium ion, lithium iron phosphate, lithium nickel manganese cobalt, or lithium nickel cobalt aluminum)	Lithium-ion batteries	Various	14,757 tons	nil	nil	nil	nil	No

Notes:

nil = No reporting requirements. The chemical has no listed threshold under this requirement.

CAS: Chemical Abstract Service

CCR: California Code of Regulations

CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act

CFR: Code of Federal Regulations

EHS: extremely hazardous substances lbs.

Prop 65: Proposition 65 RQ (reportable quantity)

SARA: Superfund Amendments and Reauthorization Act

TPQ (threshold planning quantity)

TQ: threshold quantity

1. RQs are for a pure chemical, per CERCLA SARA (ref. 40 CFR section 302, Table 302.4). Releases equal to or greater than the RQ must be reported. Under California law, any amount that has a realistic potential to adversely affect the environment and human health or safety must be reported.
2. RQ for materials as used on site. Since some of the hazardous materials are mixtures that only contain a percentage of an RQ, the RQ of the mixture can be different than for a pure chemical. For example, if a substance only contains 10 percent of a reportable chemical and the RQ is 100 pounds, the RQ for that material will be (100 pounds)/(10%) = 1,000 pounds.
3. EHS TPQ (ref. 40 CFR part 355, Appendix A). If quantities of EHS materials equal to or greater than the TPQ are handled or stored on site, they must be registered with the local Administering Agency (i.e., Fresno County Environmental Health – CUPA/Hazardous Materials Handling Program).
4. TQ is from Title 19 CCR section 2770.5 (state) or Title 40 CFR section 68.130 (federal).
5. State RQ for oil spills that will reach California state waters [CA Water Code section 13272(f)].

4.2 Data Request DR HAZ-2

DR HAZ-2: Please update Table 4.5-3 to include the toxicity, reactivity and flammability for the lithium-ion BESS.

Response: Table 4.5-3 has been updated to include the toxicity, reactivity and flammability for the lithium batteries, see Table 6, below.

Table 6 Toxicity, Reactivity, and Flammability of Hazardous Substances Stored On site

Hazardous material	Physical description	Health hazard/toxicity	Reactivity and incompatibilities	Flammability [a]
Cleaning chemicals/ detergents	Refer to individual chemical labels	Refer to individual chemical labels	Refer to individual chemical labels	Refer to individual chemical labels
Paint	Refer to individual chemical labels	Refer to individual chemical labels	Refer to individual chemical labels	Refer to individual chemical labels
Diesel No. 2	Oily, light liquid	May be carcinogenic	Strong oxidizers, acids	Flammable
Propane	Colorless, odorless gas	Liquid can cause burns similar to frostbite	Strong oxidizers	Flammable
Adhesives	Refer to individual chemical labels	Refer to individual chemical labels	Refer to individual chemical labels	Refer to individual chemical labels
Sealants	Refer to individual chemical labels	Refer to individual chemical labels	Refer to individual chemical labels	Refer to individual chemical labels
Hydraulic fluid (FR3 natural ester fluid)	Light green liquid	Minimal irritation or no effect	Strong oxidizers, Strong Alkali	Combustible
Sulfur hexafluoride (SF6)	Colorless, odorless gas	Can displace oxygen and cause rapid suffocation	None	Nonflammable

Sulfuric acid	Colorless liquid	Causes burns by all exposure routes	Strong oxidizers, combustible material, bases, organic materials, reducing agents, finely powdered metals, peroxides	Nonflammable
Ethylene glycol solution	Viscous, colorless liquid	May cause skin, eye, and respiratory tract irritation	Strong oxidizers, strong acids, strong bases, aldehydes	Combustible
1,1,1,2-tetraflurorethane	Colorless gas, faint ethereal odor	Liquid can cause burns similar to frostbite	None	Nonflammable
Gasoline	Transparent to light yellow liquid	Carcinogenic, may cause irritation to skin, nose, throat, and lungs	Strong oxidizers	Flammable
Coolant	Refer to individual chemical labels	Refer to individual chemical labels	Refer to individual chemical labels	Refer to individual chemical labels
Lubricants	Refer to individual chemical labels	Refer to individual chemical labels	Refer to individual chemical labels	Refer to individual chemical labels
Lithium batteries (lithium ion, lithium iron phosphate, lithium nickel manganese cobalt, or lithium nickel cobalt aluminum)	Battery product	Aquatic chronic toxicity; may be carcinogenic	Not considered reactive under normal conditions at ambient temperature; incompatible with combustible materials, organic chemicals, strong acids, reducing substances, strong oxidizers, and chemically active metals.	Flammable

Notes:

[a] In accordance with the California Department of Transportation (Caltrans) regulations, under 49 CFR Section 173: flammable liquids have a flash point less than or equal to 141°F; combustible liquids have a flash point greater than 141

Source: (National Institute for Occupational Safety and Health [NIOSH] 2007)

4.3 Data Request DR HAZ-3

DR HAZ-3: Table 4.5-1 lists lead acid batteries as one of the possible energy storage options for the BESS. Also, several other battery types were mentioned in Hazardous Materials, Wildfire, and Worker Safety sections, specifically sodium sulfur, and sodium or nickel hydride. Please clarify if lead acid batteries, sodium sulfur batteries or sodium or nickel hydride batteries would be used for the BESS and update the Project Description accordingly along with Tables 4.5-1, 4.5-2, and 4.5-3 (Section 2.3, p. 2.3-15).

Response: The BESS will use lithium-ion batteries as the energy storage option. Lead acid batteries will not be used for the BESS. The Project Description, Tables 4.5-1, 4.5-2, and 4.5-3 have been updated with this information and incorporated in this Response Set #1 (refer to Table 4, Table 5, and Table 6, above).

Section 2, Project Description, would be revised such that the "Project ~~could use any commercially available battery technology, including but not limited to~~ would use lithium ion, or LFP (lithium iron phosphate)~~, NMC (nickel manganese cobalt), or NCA (nickel cobalt aluminum)~~ batteries." Table 4.5-1 and 4.5-2 (Table 4 and Table 5 of this Response Set #1) and references to the BESS in Section 4.17, Worker Safety, have been updated to be consistent with Section 2.

4.4 Data Request DR HAZ-4

DR HAZ-4: Please include hazardous materials and quantities in Tables 4.5-1, 4-5.2 and 4.5-3, as appropriate, that would be required for the operation of the 45-kW diesel emergency generator that is assumed to be Tier IV (with selective catalytic reduction (SCR) controls).

Response: As noted in Data Response GHG-1 through GHG-7, diesel is no longer being considered for the emergency generator. Instead, the emergency generator would be a propane generator so no selective catalytic reduction would be required. The propane generator would need to generate up to 300 kW, likely as 2 150 kW generators. Diesel may still be used during the Project as a fuel source for the construction fleet if needed and, therefore, is retained in the hazardous materials tables. Propane is considered a hazardous material and is already included in the hazardous materials tables.

4.5 Data Request DR HAZ-5

DR HAZ-5: As required by Appendix B (j) (2), please provide the name, title, phone number, address (required), and email address (if known), of the Certified Unified Program Agency (CUPA) official who was contacted and provide the name of the CUPA official who will serve as a contact person for CEC staff.

Response: The developers of the Opt-in Application did not reach out to the CUPA for the project. However, the California Department of Toxic Substances Control was appointed the CUPA for Imperial County in January 2005. The CUPA phone number is (760) 352-0381 or 1 (866) 357-3990. The office is located at 627 Wake Avenue in El Centro California. The main contact is provided below:

Jorge Perez
Env. Health Services Manager
Imperial County, Public Health Department
jorgeperez@co.imperial.ca.us

5 Land Use

5.1 Data Request DR LAND-1

DR LAND-1: Please discuss whether and if so, how, site construction and operation could be affected by the site's proximity to the U.S.-Mexico border, which is less than 2 miles from the site, or could be affected by border-patrol activities that may occur in proximity to the site.

Response: Panorama has reached out to Border Patrol multiple times to gather information about activities that may occur in proximity to the site and any input they may have on the Project. Border Patrol has not responded. As part of the NEPA process, BLM will coordinate with federal agencies including the Department of Homeland Security to identify any recommendations they might have for the project. The Applicant would work with the Engineering, Procurement and Construction (EPC) firm prior to construction to incorporate any additional safety requirements into the Project. Once constructed, the Project would be enclosed by fences for security purposes and is not expected to be affected by any border patrol activities.

5.2 Data Request DR LAND-2

DR LAND-2: Please identify recent or proposed zoning or general plan changes that may have occurred that were not associated with infrastructure projects.

Response: Attachment C to this Response Set #1 includes cumulative tables 4-1 and 4-2 submitted in Chapter 4: Environmental Analysis of the Opt-In Application and includes an additional column identifying the permit type and associated record number. Panorama reviewed the County website and submitted a request for public records for any recent zoning changes, general plan changes, or other discretionary projects that are not associated with infrastructure projects to Imperial County on May 28th and Imperial County confirmed receipt of the request on June 4th. Panorama has received no response from the County. No recent zoning changes, general plan changes, or other discretionary projects are known within a 6-mile radius of the Project and none are anticipated due to the associated land use of either active agricultural production under Imperial County's jurisdiction or vacant BLM-administered land.

5.3 Data Request DR LAND-3

DR LAND-3: Please identify projects with discretionary reviews within the past 18 months that were not specifically associated with infrastructure projects.

Response: Please see response for DR LAND-2, above.

5.4 Data Request DR LAND-4

DR LAND-4: Please provide more details on the roles of those involved including private landowners, how the project proponent will obtain authorization for the use of private land, and how the parcels would be merged as part of the project.

Response: The Applicant has executed purchase option agreements with the private landowners, which authorize the Applicant to exercise these options to purchase the private parcels to develop the Project.

In discussions with the CEC on May 3, 2023, the applicant sought to clarify how the CEC's in-lieu of authority would be applied to the parcel merger process, which is typically done at the local level. The CEC instructed the applicant to pursue parcel mergers with Imperial County. The Applicant will prepare parcel merger, parcel map, or other applicable applications and proposed mapping that will be submitted to Imperial County to merge lots or otherwise adjust interior lot lines to facilitate project development.

5.5 Data Request DR LAND-5

DR LAND-5: Please provide explicit references to discussions within the application detailing conformance with applicable laws, regulations, ordinances, standards, adopted local, regional, state and federal land use plans, leases, and permits for the proposed project.

Response: An updated laws, regulations, ordinances, and standards table for land use is provided in Attachment D to this Response Set #1.

5.6 Data Request DR LAND-6

DR LAND-6: Please provide a table to include a schedule for obtaining permits outside the authority of the commission, and steps to obtain such permits. Create a table either in Section 4.6.5, or in Appendix E and cross reference the table in Section 4.6.5 or provide a reference if this data is provided elsewhere in the application.

Response: Attachment B to this Response Set #1 includes the permit tables submitted in Appendix E as part of the Opt-In Application and includes an additional column for the permit timing. Please note that permit timing is approximate and may change as the project progresses through the review process. The second table lists the permits that would normally be required for the Project but are not applicable due to the CEC Opt-In Application authority under AB 205.

5.7 Data Request DR LAND-7

DR LAND-7: Please undertake and document an informal DOD Clearinghouse process prior to submission of FAA Airspace Analysis. The DOD Siting Clearinghouse – Informal Review

Request Form is available at:
https://www.dodclearinghouse.osd.mil/Portals/134/DOD_Siting_Clearinghouse_Informal_Request_Form_2023.pdf.

Response: An Informal Review Request was submitted to the Department of Defense (DoD) on April 23, 2024. An Informal Review Response Letter was received from the DoD on May 31st. The letter indicated that the proposed siting location of the solar project may impact U.S. Marine Corps low-level flight training in the area and that the Applicant should contact Mr. John Gamelin (john.gamelin@usmc.mil, Deputy G-7, Governmental and External Affairs, MCIWEST, to discuss the Project. As part of the separate Federal review process with the BLM, the Applicant, BLM, and the DoD have been coordinating regarding low-level flight training. On May 8, 2024, the Applicant met with the DoD in consultation with the BLM as part of the Project's NEPA review. The applicant spoke to John Gamelin, and Jeff Meeker, Airspace Encroachment/Sustainment Regional Airspace Coordinator. John and Jeff expressed that the DoD had glint and glare related concerns and does not anticipate having concerns related to the project's infrastructure heights. The DoD provided the Applicant with a map showing a visual representation of low-level flight paths in the El Centro/Yuma area, and requested the Applicant update the Project's glint and glare analysis to include an evaluation of selected key points along the established routes. A glint and glare analysis was completed for locations requested by the DoD and no glare concerns were found. The glare study modeled observation points using ForgeSolar glare analysis tools to aircraft pilots along two military flight paths with four additional points of aerial observation.

In May 2024, BLM coordinated with U.S. Department of Defense (DoD) to determine flightpaths using the regional airspace and points of interest. Based on the established low-level routes in the El Centro/Yuma area, this analysis includes results for U.S. DoD airspace points, with the following nicknames: OP 1, PIG; OP 2, OCALA; OP 3, DOE; and OP 4, TOAD.

The modeling results show that a portion of the military flight paths have a low potential of being impacted by glare. Green glare, having a low potential for temporary after-image, was predicted for the flight path route designated by DoD as “PIG to OCALA” (model points OP 1 to OP 2). This flight path receptor represents pilots traveling eastbound, approximately parallel to I-8, north of the Perkins Project, at 5,500 feet above ground level. Green glare from the Perkins Project PV arrays along this flight path occurs annually for 7,390 minutes (123.2 hours) of the year. The potential glare impacts for this route receptor would occur during afternoon hours, approximately the winter months spanning October to March. Based on the modeling results, the DoD is unlikely to have concerns regarding the Perkins Renewable Energy Project.

6 Noise

6.1 Data Request DR NOISE-1

DR NOISE-1: At noise monitoring locations LT-6 and LT-7, provide, at a minimum, 15-minute ambient noise measurements (Leq) during the morning, evening, and late-night hours.

Response: Noise monitoring locations LT-6 and LT-7 are within the Tamarisk LTVA. The Applicant contacted the BLM on January 22, 2024 to request use information regarding the LTVA. Per the BLM Associate Field Manager, Carrie Sahagun, the BLM has unofficially closed the LTVA due to lack of use, see Attachment E to this Response Set #1. Intersect Power confirmed with the CEC at the meeting on April 25th, that due to the absence of sensitive receptors at this location noise monitoring is not needed.

6.2 Data Request DR NOISE-2

DR Noise-2: Please provide the project's aggregate operational noise level (Leq) at LT-6 and LT-7 in the BLM Long Term Visitation Area.

Response: As noted in DR NOISE-1, locations LT-6 and LT-7 are within the Tamarisk LTVA which has been closed by the BLM due to lack of use, see Attachment E to this Response Set #1. Intersect Power confirmed with the CEC at the meeting on April 25th, that because there would be no sensitive receptors at this location, analysis of operational noise levels at the location are not needed.

7 Project Description

7.1 Data Request DR PD-1

DR PD-1: Please provide a description of how the solar facility and BESS facility would interact with each other. For example, would the solar facility primarily provide power to the electrical grid and when would the BESS be charged and discharged? Section 4.1, Air Quality, page 4.1-14 states that the project would include an emergency diesel generator. However, the application does not clarify whether there would be a selective catalytic reduction (SCR) system with ammonia to control the nitrogen oxides (NOx) emissions of the emergency diesel generator.

Response: Half of the total capacity of the BESS would be optimized to support the solar facility. Energy produced by the solar facility in excess of what is dispatched onto the electric grid will be stored in the BESS.

The solar-paired BESS would be charged by excess solar generation, which typically occurs in the middle of the day when production is at its highest and demand at its lowest, and released to the grid during peak demand hours in the late afternoon and evening. The other half of the BESS would not be tied to the solar facility and would only be tied to the grid. Adding storage capacity to the California Independent System Operator (CAISO) system enables the storing of excess solar energy when it is produced in surplus and subsequently discharging that energy when it is most needed, benefiting CAISO, ratepayers, utilities, and independent power producers. With the aggressive California state renewable energy and zero-carbon electric supply targets accelerating renewable generation buildout, the energy on the grid is becoming increasingly green. Moreover, the lowest priced energy often occurs in the middle of the day, when solar facilities across the state are simultaneously operating at full capacity, which results in the optimal time to charge batteries with an increasingly higher percentage of green energy. Furthermore, enabling grid charging also allows the batteries to provide critical reliability enhancing ancillary services to the grid, such as frequency regulation and spinning reserves. Thus, the Project's BESS—both the portion paired with the solar PV facility and the portion tied directly to the grid—would support the integration of renewable energy to the larger grid.

The emergency backup generator is not intended for use during normal operations. It is included in the design to address emergency power supply failures and ensure safe and reliable backup power for the control room of the SCADA system and Project substation controls in the event of a distribution power outage. Given the limited, emergency-only usage of the generator, an SCR system with ammonia to control the NOx emissions is not being considered. SCR systems are typically used for larger generators that are run continuously and have high NOx emissions. Additionally, the emergency generator would not be run on diesel but rather is being proposed as a propane emergency generator. Propane generators emit substantially less NOx compared with diesel generators and an SCR system would not be required. The generator will utilize a non-selective catalytic reduction system (NSCR) to control emissions.

7.2 Data Request DR PD-2

DR PD-2: Please clarify whether an SCR system would be used to decrease the NOx emissions of the emergency diesel generator. If yes, please provide the project's estimated ammonia emissions. Please also provide the project's estimated nitrous oxide (N_2O) emissions based on scientific literature review or source test results.

Response: The Applicant does not anticipate using an SCR system in the emergency generator. The backup generator would be propane and would be used solely during emergencies. Propane generators emit substantially less NOx than diesel generators and will follow all California Air Resources Board (CARB) requirements for emergency backup generators. Additionally, it will follow the ICAPCD Rule 207 for emergency standby equipment. See also response to DR AQ-3, which provides a specification sheet, including NOx emissions, for an example LPG-fired backup emergency generator that could be used on site.

7.3 Data Request DR PD-3

DR PD-3: Please describe the handling of ammonia on site, specifically would the ammonia be stored on site and if so, please describe the storage container and the proposed location within the project. If the ammonia would be trucked into the project, please provide the number of truck trips and frequency of such deliveries.

Response: As noted, the Applicant does not anticipate using an SCR system in the emergency generator and therefore does not anticipate any handling of ammonia on the site.

7.4 Data Request DR PD-4

DR PD-4: Please identify and label the county on each map (Figures 6 to 11), please identify and label the county-international border on applicable maps; and please identify and label the township, range and section(s) in each figure title (Figures 7 to 11).

Response: Updated Project figures have been provided, see Attachment C and Attachment F of this Response Set #1.

7.5 Data Request DR PD-5

DR PD-5: Please identify existing transmission and gen-tie lines on project figures presented in Subsection 2.3 and Appendix F, and please provide Geographic Information System (GIS) shape files to CEC to identify the locations of existing gentie lines/overhead transmission lines in the project vicinity so that they are available for analysis.

Response: The existing transmission and gen-tie lines have been added as linear data to Chapter 4, Figure 4-1, cumulative projects within a 6-mile radius. Table 4-1 has been updated accordingly. The updated figure and table are presented in Appendix F of this Response Set #1.

8 Public Health

8.1 Data Request DR PH-1

DR PH-1: Please provide a map showing sensitive receptors and offsite workers within six-mile radius of the project boundary.

Response: See response to DR AQ-6 and Figure 1 of this Opt-in Application which shows the sensitive receptors within a 6-mile radius of the Project site. As noted in the response to DR AQ-6, the Tamarisk LTVA is closed and the IID worker housing is not in use. The nearest sensitive receptor is a residence 3.3 miles away from the Project site.

8.2 Data Request DR PH-2

DR PH-2: Please provide a Health Risk Assessment of the project during construction and operation to demonstrate that the project impacts to sensitive receptors and worker receptors would be less than significant. The Health Risk Assessment should show risks of cancer, non-cancer chronic exposure, and non-cancer acute exposure.

Response: See response to DR AQ-8. As discussed with the CEC at the meeting on April 25, 2024, the CEC confirmed that due to the absence of sensitive receptors or populations in proximity to the Project a Health Risk Assessment is not required. A screening model was conducted using AERSCREEN (Attachment A.2 to this Response Set #1) and the results indicate that pollution concentrations at receptors would be low, particularly during operation. Therefore, more detailed evaluation of cancer, non-cancer chronic exposure, and non-cancer acute exposure is not required.

8.3 Data Request DR PH-3

DR PH-3: Please provide a listing of the input data and output results, in both electronic and print formats, used to prepare the HARP health risk assessment.

Response: See response to DR PH-2, above.

9 Socioeconomics

9.1 Data Request DR SOCIO-1

DR SOCIO-1: The California Code of Regulations (CCR), Title 20, Article 6, Appendix B, Information Requirements for an Application, identifies the need to identify the applicable local agencies with taxing powers and their most recent and projected revenues (Appendix B (g) (7) (A) (i)). Please provide data to address the most recent and projected revenues and whether the proposed project would have an effect on revenues including direct and indirect effects.

Response: The project would be located in unincorporated Imperial County. Current taxes account for $45.2 million of the General Fund's $122.5 million in revenue budgeted for 2024. The total county budget for 2024 appropriates to $662.5 million.

In regard to specialty equipment imported to Imperial County, initial construction would generate $33.8 million for the county in sales tax revenue over 2 years or an average of $16.9 million per year. This would be equivalent to 13.8 percent of the general fund. Replacement equipment imported over the lifetime of the Project would generate an estimated average of $50,752 per year for the County.

Construction activity would generate an estimated $1.6 million of tax revenue for Imperial County over the two years of construction or about $800,000 per year for two years, including indirect and induced economic activity. Annually, Project operations would generate an estimated $110,000 in tax impact results for the County on an annual basis, including indirect and induced economic activity, see Appendix R Section 5.4.6 of the Opt-in Application.

9.2 Data Request DR SOCIO-2

DR SOCIO-2: Appendix B requires the identification of social characteristics, including population and demographic and community trends (Appendix B (g) (7) (A) (ii)). Detailed data is provided showing historical data. Using this data, please provide a brief discussion or conclusions pertaining to anticipated changes in social characteristics, including population, demographic and community trends during the timeframe associated with construction and operation of the proposed project including any direct or indirect effects.

Response: Construction of the Project would have an average workforce of 700 per year for 2 years, with a peak workforce of up to 1,000. During construction, it is anticipated that up to 100 workers could move into the area which constitutes a 1 percent population increase in Imperial County and Yuma County. The remainder of the workforce during construction (600 based on average or 900 based on peak) would be sourced from nearby cities and census designated places including approximately 65 percent from Imperial County, California, and 35 percent from Yuma County, Arizona. Therefore, approximately 90 percent of the workforce during construction is already counted among the region's permanent population and would not be expected to result in changes to social characteristics of the region. Union workers would be hired for the Project during construction to the extent available which are anticipated to be similar in demographics as the existing population. Attachment G to this Response Set #1 provides a table with the breakdown of the existing race and ethnicity composition in the Project area. Because 90 percent of the workforce would be sourced locally and those construction workers hired from outside the area would only constitute a 1 percent population change in Imperial County and Yuma County temporarily, the Project would not significantly affect social characteristics, including population, demographic, or community trends, within the region during construction. In addition, the poverty rate is high in the Project area and would see a temporary decrease during construction through higher-than-average wages. Approximately 230 industries in Imperial County and 241 industries in Yuma County would receive at least some beneficial impact through either direct, indirect, or induced economic impacts.

No significant changes to social characteristics are expected during operation and maintenance of the Project. The workforce during operation and maintenance, comprising approximately 18 workers over the life of the Project, would be primarily sourced from the surrounding area and are therefore already counted among the region's permanent population.

9.3 Data Request DR SOCIO-3

DR SOCIO-3: Appendix B requires existing and projected unemployment rates (Appendix B (g) (7) (A) (iii)). Using the data provided on historic unemployment rates, please provide a brief discussion and/or conclusions pertaining to anticipated changes in unemployment rates/trends during timeframe associated with the construction and operation of the proposed project including any direct or indirect effects.

Response: Unemployment in Imperial County and Yuma County has been falling in recent years but remains high. As of November 2023, there were 14,048 unemployed persons in Imperial County, as well as 14,768 unemployed persons in Yuma County, representing 18.7 and 14.1 percent unemployment rates, respectively. Unemployment rates may continue to fall, as historic data suggests, and will see a temporary positive benefit from the Project during construction. The total number of direct jobs supplied by the Project during construction would be an average of 700 per year for 2 years, with a peak workforce of up to 1,000. Approximately 65 percent of the workforce during construction is expected to be sourced from Imperial County, California, and 35 percent of the workforce is expected to be sourced from Yuma County, Arizona. Based on these percentages, the Project would temporarily reduce the unemployment rate in Imperial County to 18.1 percent (average direct jobs), or to 17.8 percent (peak direct jobs). The Project would temporarily reduce the unemployment rate in Yuma County to 13.9 percent (average direct jobs), or to 13.8 percent (peak direct jobs). An additional 166 indirect jobs and 177 induced jobs would also be temporarily created by the Project to support construction.

The workforce during operation and maintenance, comprising approximately 18 workers over the life of the Project, would produce a less than 0.1 percent change in the unemployment rate in either Imperial or Yuma County, and would not produce a discernable change to unemployment.

9.4 Data Request DR SOCIO-4

DR SOCIO-4: Appendix B requires an estimate of applicable school impact fees (Appendix B (g) (7) (B) (vi)). Please provide the current year school impact fees for the school districts the project is proposed within. Please describe and provide a total square footage of the covered and enclosed area assessed for school impact fees.

Response: Panorama reached out to the Administrative Assistant at the Holtville Unified School District, Ann Garcia, on April 22, 2024. Per the discussion with the District, the required commercial impact fee that would apply to the Project is $0.78 cents per square foot. This fee would apply only to private land under the jurisdiction of Imperial County. Based on the fee amount and the conservative assumption that the entire private land portion of the Project Application Area would be developed, the anticipated school impact fee could be up to $4,780.

The Holtville Unified School District enrolls 1,573 students in 7 schools, spanning all levels of education. As noted above, 90 percent of the workforce is expected to come from local communities and, therefore, would not change existing enrollment. However, during construction, assuming conservatively that 5 percent of all workers enroll one student each in the Holtville Unified School District, there would be 35 incremental students for two years. Refer to Table 7 for a summary of the school district finances on a per student and total basis. Project impacts are estimated by extrapolating revenues and expenses per student. The Project would have an overall 1.8 percent impact on the Holtville Unified School District budget. It should be noted that only up to 100 workers are anticipated to migrate to the Project area and is unlikely that workers would enroll their children in the Holtville Unified School District during construction. Therefore, Table 7 represents a conservative estimate.

Table 7 Project Impacts to the Holtville Unified School District Budget

Category	Existing condition (per student)	Existing condition (total students)	Project impact (total students)
Students	1	1,573	35
Expenditure	($16,993)	($26,729,989)	($594,755)
Capital Outlay	($1,566)	($2,463,318)	($54,810)
Interest on debt	($302)	($475,046)	($10,570)
Other	($123)	($193,479)	($4,305)
Revenue	$18,648	$29,333,304	$652,680

Total Budget	($336)	($528,528)	($11,760)

Source: (National Center for Education Statistics, 2023)

9.5 Data Request DR SOCIO-5

DR SOCIO-5: Appendix B requires the following data and analysis: an estimate of the total construction payroll and separate estimates of the total operation payroll for permanent and short-term (contract) operations employees; an estimate of the expenditures for locally purchased materials for the construction and operation phases of the project; an estimate of the capital cost (plant and equipment) of the project; an estimate of sales taxes generated during construction and separately during an operational year of the project; an estimate of property taxes generated during an operational year of the project; and the expected direct, indirect, and induced income and employment effects due to construction and operation of the project (Appendix B (g) (7) (B) (vii to xii)). This data is presented in a data section for which an application for confidentiality is pending, but the section was reviewed by staff for completeness. In the event that CEC allows the applicant to exclude this data from public disclosure, Section 4.10, Socioeconomics must be revised to provide a non-confidential qualitative analysis that describes the conditions and results/impacts of the requested analyses. Should the request to maintain confidential data be refused, Section 4.10 must be updated to include the redacted data.

Response: An updated redacted version of Section 4.10, Socioeconomics has been submitted in response to direction provided by the CEC that provides the data requested here (refer to Attachment H of this Response Set #1).

9.6 Data Request DR SOCIO-6

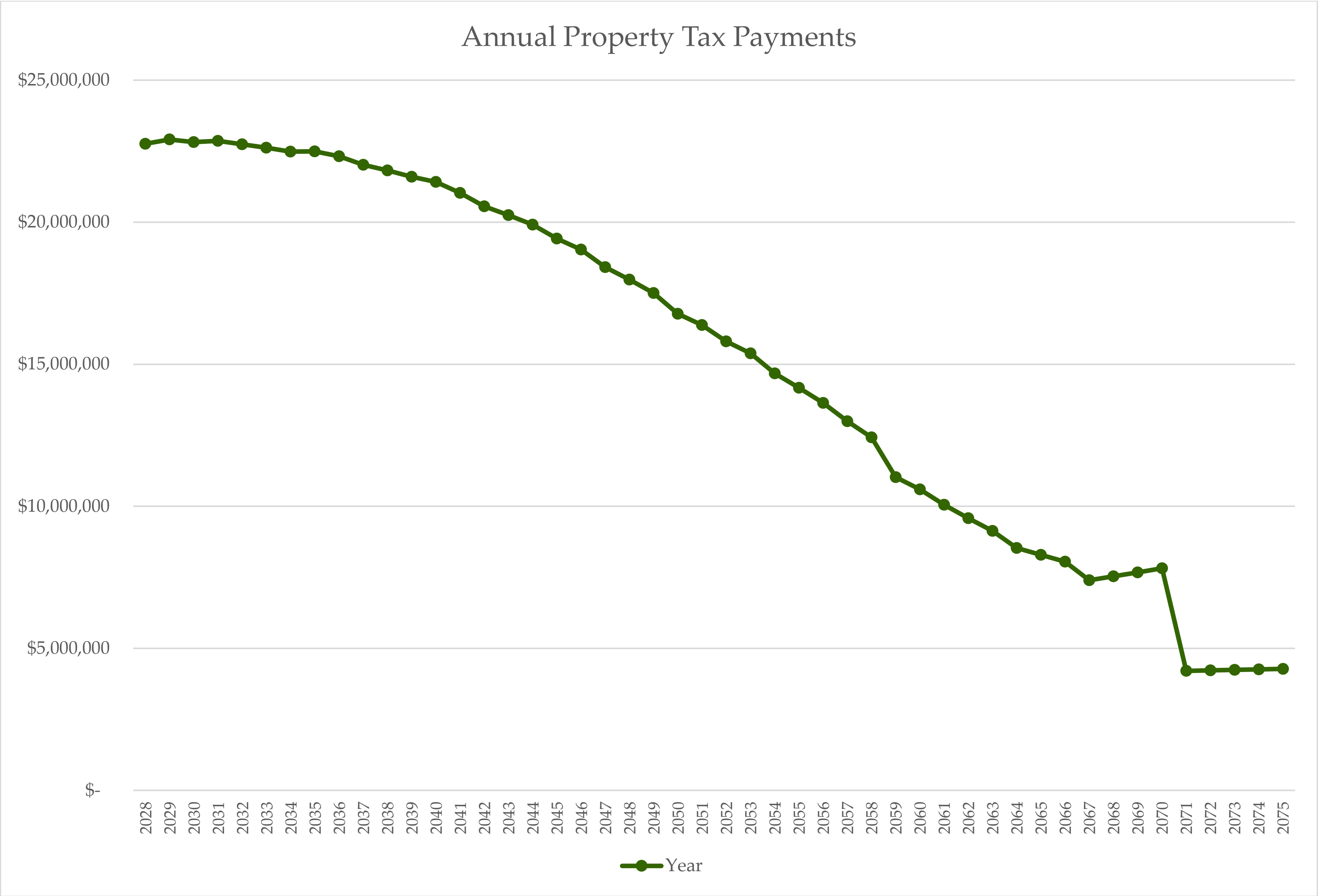
DR SOCIO-6: Appendix B identifies the need for an estimate of property taxes generated during an operational year of the project (Appendix B, (g) (7) (B) (xi)). Although property tax data is presented in Table 4.10-35 the section does not provide an estimate of property taxes during an operational year of the project. Please provide an estimate of property taxes generated during an operational year of the proposed project.

Response: The current annual real property tax on the eight private, vacant parcels is $1,142, or $193 per acre. Purchase of the land for the solar facility development would increase assessed value to purchase prices. While unknown at this time, if the average purchase price is $10,000 per acre, the total valuation would increase to over $5 million, and the annual real property tax revenue would be approximately $60,000.

Annual property tax payments would decline from approximately $22,911,080 at a peak in 2029 to $4,277,174 in 2075 as the property depreciates (refer to Figure 2). Appendix R, Socioeconomic, Economic Impact, and Fiscal Analysis, Section 6.1.1 provides details regarding the depreciation calculation.

Additionally, as noted in Section 6.3 of Appendix R, Socioeconomic, Economic Impact, and Fiscal Analysis, the Project would be liable for possessory interest tax, which in California, possessory interests are subject to property taxes unless a qualifying exemption applies. The tax would be paid annually corresponding to the 48 operating years. The value taken to be the $2.3 million annual MW capacity fee payment and the tax rate is 1.1301 percent. Using a 9 percent discount rate gives NPV of the combined annual payments of $10,704,907.

Figure 2 Estimated Annual Property Tax Payments



9.7 Data Request DR SOCIO-7

DR SOCIO-7: Appendix B requires tables that identify laws, regulations, ordinances, standards; adopted local, regional, state, and federal land use plans, leases, and permits applicable to the proposed project; and a discussion of the applicability of, and conformance with each. The table or matrix shall explicitly reference pages in the application wherein conformance with each law or standard during both construction and operation of the facility is discussed (Appendix B (i) (1) (A)). The provided tables do not reference pages in the application wherein conformance with each law or standard is discussed. Please provide data or cross references.

Response: Attachment I to this Response Set #1 includes the three tables from Section 4.10.5: Laws, Ordinances, Regulations, and Standards Compliance with an additional column documenting the appropriate section reference of compliance.

10 Traffic and Transportation

10.1 Data Request DR TRANS-1

DR TRANS-1: Please explain how the 50 percent vehicle trip reduction during construction was calculated and how implementation of this Construction Traffic Control Plan will achieve this stated trip reduction. List the documents that support the conclusions. This can be added to the study in Appendix T and summarized in the main application document.

Please provide a mitigation measure that includes a list of requirements that will be part of the Construction Traffic Control Plan (e.g., ride share program, alternative work schedules, list of permits required).

Response: The 50 percent vehicle trip reduction during construction was based on the definition of "ridesharing" in the California Vehicle Code which defines "ridesharing" as two or more persons traveling by any mode, including, but not limited to, carpooling, vanpooling (shuttles), jitney, and public transit." Cal. Veh. Code § 522. This definition was provided in Appendix T, Transportation Impact Analysis Report, of the Opt-in Application.

Appendix T, Section E. Temporary Construction Mitigation Measures, was revised and submitted as part of this Response Set #1 (Attachment J). The 50 percent reduction during construction is a target/goal but is not always possible to achieve at remote construction sites for several reasons, including that many skilled tradesmen require use of their vehicle and the specialized tools it contains to do their job, variations in worker start times and shift durations that can occur at construction sites, and because a segment of commuters in all occupations prefer to drive in their own vehicle rather than rely on rideshare or transit. Traditional measures to reduce the number of vehicles on-site like ridesharing, vanpools, and frequent shuttle / coach services would be combined with measures that spread arriving and departing traffic over several hours, the most common of which is staggered shift times. Refer to Attachment J of this Response Set #1 for further information and clarification regarding implementation of the trip reduction program element of the Construction Traffic Control Plan. The Traffic Control Plan Mitigation Measures provided in Appendix T, Section 1 Executive Summary, has been updated accordingly and is also provided below. Note that Impact TR-1 in Section 4.12.2 of the Opt-in Application does not account for the potential 50 percent reduction in construction trips, but rather assumes that construction would generate a maximum of 1,024 AM peak period and 1,024 PM peak period vehicle trips from workers, delivery trucks, and water trucks. It further assumes that all construction workers would enter and depart the Project site during a single peak period. Even with this conservative assumption, Impact TR-1 would be less than significant. All intersections would operate at a LOS C or better during the AM peak period. Although the Project PM peak traffic LOS would potentially exceed the Caltrans "endeavored goal" of LOS D at the stop-controlled left turns from the I-8 westbound off-ramp, the Caltrans goal is not mandatory. Further, the 49.1 seconds per vehicle delay at the off-ramp is within the threshold for acceptable delays at side-street stop-controlled intersections (50 seconds) identified in the Highway Capacity Manual 6th Edition. Additionally, the Project would implement various measures to ensure that construction traffic would not conflict with roadway operations, including flagging operations during periods of concentrated inbound or outbound worker traffic, ongoing monitoring of construction traffic, warning and speed limit signs, travel restrictions, and Caltrans coordination, in addition to the trip reduction (i.e., rideshare/carpool) program. (See Attachment J). Accordingly, while the Applicant anticipates that the trip reduction program will achieve an approximately 50 percent reduction in construction trips, impacts would be less than significant without the trip reductions.

Prepare a Construction Traffic Control Plan (CTC Plan).

Prior to the start of construction, the Project owner shall submit a Construction Traffic Control Plan for review and approval by Caltrans and the CEC for affected roads and intersections that would be directly affected by the construction activities and/or would require permits and approvals. The Construction Traffic Control Plan shall include, but not be limited to:

1. Implementation of a trip reduction program (TRP) as described in revised section E
2. Assignment of a part-time Construction Traffic Control Plan Coordinator
3. Partial funding of ride share services by the applicant
4. A flagging operations plan (approved by Caltrans). The locations and use of flaggers, warning signs, barricades, delineators, cones, arrow boards, etc., according to standard guidelines outlined in the Manual on Uniform Traffic Control Devices, the Standard Specifications for Public Works Construction, and/or the California Joint Utility Traffic Control Manual.
5. Traffic monitoring plan
6. Encroachment Permits (from Caltrans)
7. Advance coordination with emergency service providers to avoid restricting the movements of emergency vehicles. Police departments and fire departments shall be notified in advance by the Project owner of the proposed locations, nature, timing, and duration of any roadway disruptions, and shall be advised of any access restrictions that could impact their effectiveness. At locations where roads will be blocked, provisions shall be ready at all times to accommodate emergency vehicles, such as immediately stopping work for emergency vehicle passage, providing short detours, and developing alternate routes in conjunction with the public agencies.

10.2 Data Request DR TRANS-2

DR TRANS-2: If there is a local vehicle-miles traveled (VMT) analysis methodology, please describe it and apply it to the project calculation of VMT impacts and conclusions. If there is not a local VMT analysis methodology, please use the Governor's Office of Planning and Research (OPR) new California Environmental Quality Act (CEQA) guidelines methodology. Please include expected project traffic by roadway, percent traffic increases by roadway, a discussion of impacts on key intersections and road segments. Please include a list of needed road and traffic control improvements at the proposed site access points. List the thresholds of significance used and describe the methodology used.

Response: Imperial County does not have a local VMT analysis methodology so the OPR CEQA guidelines methodology would be appropriate. OPR CEQA guidelines note that "If existing models or methods are not available to estimate the VMT for the particular project being considered, a lead agency may analyze the project's VMT qualitatively. Such a qualitative analysis would evaluate factors such as the availability of transit, proximity to other destinations, etc. For many projects, a qualitative analysis of construction traffic may be appropriate." (CEQA Guidelines Section 15064.3) The construction VMT discussion included in Section 4.12.2 Traffic and Transportation, Impact TR-2 is a qualitative approach that evaluates proximity to other destinations and average commuter distances to the Project site.

For operational VMT impacts, as noted in Section 4.12.2 of the Opt-in Application, OPR suggests that "new development projects that generate or attract fewer than 110 trips per day generally may be assumed to cause a less-than-significant transportation impact". During Project operation, the Project would generate fewer than 120 average daily trips and is under the average daily trips screening threshold. Consequently, Project operation is screened out of a VMT analysis. As the Project is screened out of a VMT analysis, it may thus be presumed to have a less-than-significant operational impact, which is consistent with the VMT analysis in Section 4.12.2.

Impact TR-1 in Section 4.12.2 of the Opt-in Application discusses expected project traffic by roadway, percent traffic increases by roadway, a discussion of impacts on key intersections and road segments as well as the proposed site access points.

10.3 Data Request DR TRANS-3

DR TRANS-3: Calculate and list estimated one-way trip lengths for workers, deliveries, and truck haul trips generated during the construction and operation of the project.

Response: As noted in the call with the Energy Commission on May 23, 2024, VMT calculations may not be required if a project is under the threshold for significance. A Project Memorandum has been prepared in response to DR TRANS-3 explaining the methodology used for VMT and why impacts would be less than significant. Therefore, the estimated one-way trip lengths for workers, deliveries, and truck haul trips would not be needed. Please see Attachment J of this Response Set #1.

10.4 Data Request DR TRANS-4

DR TRANS-4: Please describe public roadways and intersections that would be temporarily or permanently altered during construction including the duration of activities. Provide a description of the access points for the site during construction.

Response: The only public roadway that would be temporarily and permanently altered would be State Route (SR) 98. Up to five access points would be constructed off SR 98 to access the site. The driveways are shown on Figure 2.3-1 and 2.3-2, Project Layout Options 1 and 2 and GIS associated with the access points was provided to the CEC with the Opt-in Application. The GIS for the access points can be provided to the CEC again, if needed.

The access roads and driveways would be 24 feet wide (20 feet wide with a 2-foot shoulder on each side) and constructed to achieve facility maintenance requirements and Imperial County standards. The access roads and driveways would be surfaced with gravel, compacted soil, or another commercially available surface, depending upon site conditions and constraints. Shoulders would be of the same material albeit less compacted and would allow vehicles to pass one another.

While the Project Description provides information about the access points, the exact locations would be coordinated with CalTrans and incorporated into final project engineering. The Project would not be accessed via I-8.

10.5 Data Request DR TRANS-5

DR TRANS-5: Please provide more detail about project-related hazardous materials to be transported to or from the project during project construction and operation. Please list the estimates quantities, number of trips, anticipated routes, means of transportation, and any hazards associated with such transport.

Response: Estimated quantities of hazardous materials are provided in Table 4.5-1 of the Opt-in Application, which has been updated in Data Response DR HAZ-1. The largest amount of hazardous materials transported to the site would be for the hydraulic fluids for the transformers and the lithium-ion batteries. Smaller amounts of gasoline, diesel fuel, and propane would also be transported. For any hazardous materials, transportation would comply with applicable hazardous materials law.

The hazardous fluids would travel via appropriately permitted tanker trucks which typically hold between 5,500 to 9,000 gallons of fluid. The Project would be anticipated to require between 53 and 87 truck trips for the GSU hydraulic fluids and between 64 and 104 truck trips for the MVT hydraulic fluids. All transportation of hazardous substances would occur with USDOT-approved personnel and trucking/transport equipment.

Up to 5,000 individual BESS electrical enclosures measuring approximately 40 feet or 52 feet by 8 feet by 8.5 feet high would be installed, requiring up to 5,000 truck trips. All transportation of hazardous substances would occur with USDOT-approved personnel and trucking/transport equipment.

Truck trips associated with all construction materials and equipment deliveries, including any carrying hazardous materials, would likely come from within the El Centro, Yuma, and/or Calexico area, via the Interstate 8 to SR 98 to the Project site with some materials trips likely originating from the Ports of Long Beach and San Diego. Deliveries from San Diego would also likely come from the Interstate 8 to SR 98. Deliveries from Long Beach would likely travel via SR 73 to Interstate 5 to Interstate 8 to SR 98.

Hazards associated with transportation of hydraulic fluids and the BESS are described in the Opt-in Application Section 4.12.2, Impact TR-5.

10.6 Data Request DR TRANS-6

DR TRANS-6: Please provide a list of agency and official contact phone numbers related to transportation.

Response: Table 8 lists agency and official contact phone numbers related to transportation.

Table 8 Agency Contacts for Traffic and Transportation

Issue	Agency	Contact
Transportation Permit for Oversized Loads	Caltrans	Ai Tran, Lead for Annual Permits Transportation Permits Issuance Branch 1823 14th Street Sacramento, CA 95814 916-639-5739
Hazardous Material Transportation License	CHP	Angela Gonzales Hazardous Material Licensing P.O. Box 942898 Sacramento, CA 942898 916-843-3400
Safety Permits	Federal Motor Carrier Safety Administration	California Division Office 1325 J Street, Suite 1540 Sacramento, CA 95814 916-930-2760

11 Visual Resources

11.1 Data Request DR VIS-1

DR VIS-1: Please provide camera type, lens focal length, viewing angle; date and time the photograph was taken, and the distance to the project.

Response: Initial site reconnaissance was completed on November 12, 2023. Photographs used to assess the existing conditions for representative photographs were taken using a digital single-lens reflex camera with standard 43-millimeter lens equivalent, which represents an approximately 46-degree horizontal view angle. Photographs were taken approximately between 12:30 P.M. to 4:00 P.M. The details for each viewpoint are provided in Table 9.

Table 9 Photograph Viewpoint Data

Viewpoint	1C	2	3	4B	Loop-in Line
Photo Date	11/12/2023	11/12/2023	11/12/2023	11/12/2023	01/26/2024
Photo Time	3:32pm	12:41pm	12:55pm	3:48pm	2:47pm
Distance to Project Fenceline	190 feet	560 feet	875feet	750 feet	500 feet
Camera Used	EOS 5d (full frame)	EOS 5d (full frame)	EOS 5d (full frame)	EOS 5d (full frame)	EOS 5d (full frame)
Lens Used	43mm	42mm	42mm	43mm	42mm
Pre-Crop Viewing Angle	45.4	46.4	46.4	45.4	46.4
Cropped Size	4742x3117	4743x3121	4745x3150	4743x3110	4742x3117
Calculated Angle	44.8	45.84	45.86	44.86	45.83
Approximate View Angle	45	46	46	45	46

11.2 Data Request DR VIS-2

DR VIS-2: Please provide the photo-realistic simulation one year after completion of construction.

Response: Photo-realistic simulations have been provided and are included in Attachment K of the Response Set #1, Figures 4.13-1, 4.13-3, 4.13-5, 4.13-7, 4.13-9, and 4.13-11.

Attachment K also includes a write up of all of the simulations.

11.3 Data Request DR VIS-3

DR VIS-3: Please provide all the full-page color digital high-resolution files of the key observation point (KOP) photographs and photo-realistic simulations of at least 600 dots per inch depicting representative above ground section of the transmission route after construction.

Response: The digital high-resolution files have been provided as part of this Response Set #1.

11.4 Data Request DR VIS-4

DR VIS-4: Please provide project specific conceptual outdoor lighting control and management plan (lighting plan) and explain the control of reflectance from exterior surfaces offsite that conform with the county government code.

Response: The level of lighting detail requested for the Project is usually prepared later in the design process during final engineering. The Applicant proposes lighting for the portion of the project located on privately-owned land that is consistent with the lighting proposed for the portion of the project located on BLM land. The Applicant is coordinating with the BLM as a separate and parallel review process to the CEC Opt-in Application. The BLM has specific requirements regarding lighting conformance, including night lighting requirements, per *Best Management Practices for Reducing Visual Impacts of Renewable Energy Facilities on BLM-Administered Lands* and *Night Sky and Dark Environments: Best Management Practices for Artificial Light at Night on BLM-Managed Lands* (U.S. Bureau of Land Management, 2013a; U.S. Bureu of Land Management, 2013b). The Best Management Practices (BMPs) include, but are not limited to, requirements for anti-glare and color-treated solar collectors and support structures; and measures to avoid over-illumination and minimize light trespass, light clutter, and skyglow. Project proponents are required to use the minimum number of luminaries and lights required with the lowest lumen output consistent with safe and secure operation of the facility, among other requirements. The BLM assesses Conformance with these requirements per the preparation of plans, such as a Lighting Plan and a Glint and Glare Assessment, Mitigation, and Monitoring plan. As discussed with the CEC May 3, 2024, the level of detail and assessment required by the BLM would ensure visual impacts associated with night skies and glint and glare would be less than significant.

Lighting and glare were also already addressed in Impact VIS-4 in Section 4.13.2 and found to be less than significant.

11.5 Data Request DR VIS-5

DR VIS-5: Please provide a list of the project-specific luminaires, identify the design (e.g., full cutoff, semi cutoff, non-cutoff) and indicate if the luminaires have the International Dark-Sky Association Fixture Seal of Approval to the extent feasible consistent with safety and security considerations. Show the project-specific luminaires locations on a diagram or elevation.

Response: Please see response to DR VIS-4.

11.6 Data Request DR VIS-6

DR VIS-6: Please provide the name, title, phone number, address (required), and email address (if known), of an official who was contacted within each agency, and also provide the name of the official who will serve as a contact person for commission staff.

Response: No agencies other than the BLM were contacted for the visual resources section analysis.

11.7 Data Request DR VIS-7

DR VIS-7: Please provide a schedule indicating when permits outside the authority of the CEC will be obtained and the steps the applicant has taken or plans to take to obtain such permits.

Response: The permit table provided in Attachment E.2 of the Opt-in Application has been updated to include an estimated schedule for obtaining the permits, see Attachment B of this Response Set #1.

12 Worker Safety

12.1 Data Request DR WS-1

DR WS-1: Please include discussions of the implementation of 8 CCR 3395 Heat Illness Prevention during construction and operations.

Response: Title 8, Section 3395 of the CCR includes requirements that address heat illness prevention. Heat illness prevention during general construction activities would be addressed in the Construction Injury and Illness Prevention Program (IIPP) and Construction Personal Protective Equipment (PPE) Programs. Heat illness prevention during general Project operations would be addressed in the O&M IIPP and O&M PPE Programs. Thus, the Project would comply with the requirements set forth in 8 CCR § 3395, et seq.

Section 4.17, Worker Safety, of the Opt-In Application includes a description of the Construction IIPP, Construction PPE Program, O&M IIPP, and O&M PPE Program starting on page 4.17-12. A row for CCR Title 8, Section 3395, was also updated to specify that heat illness prevention would be addressed in the Construction IIPP, Construction PPE Program, O&M IIPP, and O&M PPE Program, see Table 10, below.

Table 10 State Laws, Ordinances, Regulations and Standards

LORS	Applicability	Section discussed in AFC
California Occupational Safety and Health Act, 1970	Establishes minimum safety and health standards for construction and general industry operations in California.	The Project would adhere to the health and safety guidelines outlined in the Occupational Safety and Health Act.
8 CCR339	Requires list of hazardous chemicals relating to the Hazardous Substance Information and Training Act.	The Project would adhere to the policies outlined in 8 CCR § 339.
8 CCR § 1509	Addresses requirements for construction, accident, and prevention plans.	The Project would adhere to the policies outlined in 8 CCR § 1509.
8 CCR 1509, et seq. §§ 1684 et seq.	Addresses construction hazards, including head, hand, and foot injuries and noise and electrical shock.	The Project would adhere to the policies outlined in 8 CCR § 1509, et seq., and 1684, et seq.

8 CCR §§ 1528 et seq. and §§ 3380 et seq.	Requirements for PPE	The Project would adhere to the policies outlined in 8 CCR § 1528, et seq., and 3380, et seq.
8 CCR 1597 §§ et seq. and §§ 1590 et seq.	Requirements addressing the hazards associated with traffic accidents and earth moving	The Project would adhere to the policies outlined in 8 CCR § 1597, et seq., and 1590, et seq.
8 CCR §§ 1604, et seq.	Requirements for construction hoist equipment	The Project would adhere to the policies outlined in 8 CCR § 1604.
8 CCR §§ 1620 et seq. And §§ 1723 et seq.	Addresses miscellaneous hazards	The Project would adhere to the policies outlined in 8 CCR §§ 1620 et seq. and §§ 1723 et seq.
8 CCR §§ 1709 et seq.	Requirements for steel reinforcing, concrete pouring, and structural steel erection operations	The Project would adhere to the policies outlined in 8 CCR § 1709.
8 CCR §§ 1920 et seq.	Requirements for fire protection systems	The Project would adhere to the policies outlined in 8 CCR § 1920.
8 CCR §§ 2300 et seq. And §§ 2320 et seq.	Requirements for addressing low voltage electrical hazards	The Project would adhere to the policies outlined in 8 CCR §§ 2300 et seq. and §§ 2320 et seq.
8 CCR §§ 2395 et seq.	Addresses electrical installation requirements	The Project would adhere to the policies outlined in 8 CCR § 2395.
8 CCR §§ 2700 et seq.	Addresses high-voltage electrical hazards	The Project would adhere to the policies outlined in 8 CCR § 2700.
8 CCR §§ 3200 et seq. And §§ 5139 et seq.	Requirements for control of hazardous substances	The Project would adhere to the policies outlined in 8 CCR § 3200.
8 CCR §§ 3203 et seq.	Requirements for operational accident prevention programs	The Project would adhere to the policies outlined in 8 CCR § 3203.
8 CCR §§ 3270 et seq. §§ and 3209, et seq.	Requirements for evacuation plans and procedures	The Project would adhere to the policies outlined in 8 CCR § 3270.
8 CCR §§ 3360 et seq.	Addresses requirements for sanitary conditions	The Project would adhere to the policies outlined in 8 CCR § 3360.
8 CCR § 3395, et seq.	Addresses heat illness prevention in outside places of employment. Throughout this Opt-In Application heat illness prevention would be addressed in the Construction IIPP, Construction PPE Program, O&M IIPP, and O&M PPE Program.	The Project would comply with the requirements set forth in 8 CCR § 3395, et seq.

8 CCR §§ 3511 et seq. And §§ 3555 et seq.	Requirements for addressing hazards associated with stationary engines, compressors, and portable, pneumatic, and electrically powered tools	The Project would adhere to the policies outlined in 8 CCR § 3511.
8 CCR §§ 3649 et seq. And §§ 3700 et seq.	Requirements for addressing hazards associated with field vehicles	The Project would adhere to the policies outlined in 8 CCR § 3649.
8 CCR §§ 3940 et seq.	Requirements for addressing hazards associated with power transmission, compressed air, and gas equipment	The Project would adhere to the policies outlined in 8 CCR § 3940.
8 CCR §§ 5109 et seq.	Requirements for addressing construction accident and prevention programs	The Project would adhere to the policies outlined in 8 CCR § 5109.
8 CCR §§ 5110 et seq.	Requirements for the implementation of an ergonomics program	The Project would adhere to the policies outlined in 8 CCR § 5110.
8 CCR §§ 5150 et seq.	Requirements for confined-space entry	The Project would adhere to the policies outlined in 8 CCR § 5150.
8 CCR §§ 5155 et seq.	Requirements for use of respirators and for controlling employee exposure to airborne contaminants	The Project would adhere to the policies outlined in 8 CCR § 5155.
8 CCR §§ 5160 et seq.	Requirements for addressing hot, flammable, poisonous, corrosive, and irritant substances	The Project would adhere to the policies outlined in 8 CCR § 5160.
8 CCR §§ 5192 et seq.	Requirements for conducting emergency response operations	The Project would adhere to the policies outlined in 8 CCR § 5192.
8 CCR §§ 5193 et seq.	Requirements for controlling employee exposure to bloodborne pathogens associated with exposure to raw sewage water and body fluids associated with first aid/CPR duties	The Project would adhere to the policies outlined in 8 CCR § 5193.
8 CCR §§ 6150 et seq.; 6151 et seq.; 6165 et seq.; 6170 et seq.; and 6175 et seq.	Fire protection requirements	The Project would adhere to the policies outlined in 8 CCR §§ 6150 et seq.; 6151, et seq.; 6165, et seq.; 6170, et seq.; and 6175, et seq.
22 CCR	Requirements for satellite hazardous waste accumulation	The Project would adhere to the requirements for any hazardous waste accumulated in the Application Area.

Title 24, Part 3, California Electrical Code	The California Occupational Safety and Health Administration (Cal-OSHA) electrical safety regulations incorporate the requirements of the Uniform Electrical Code located in Title 24, Part 3.	The Project would adhere to the policies outlined in Title 24.
Health and Safety Code §§ 25531 et seq.	Requires that every new or modified facility that handles, treats, stores, or disposes of more than the threshold quantity of any of the listed regulated materials prepare and maintain a Risk Management Plan (RMP).	The Project would adhere to the policies outlined in Health and Safety Code § 25531.
California Public Resources Code (PRC) § 4296	Presents guidelines for minimum clearance requirements around utility poles and transmission lines including a 10-foot clearance of tree branch or ground vegetation from base of poles carrying more than 110 kV and maintaining a 10-foot clearance between trees and transmission lines carrying more than 110 kV.	The loop-in transmission would adhere to this requirements as does the existing Southwest Powerlink.
CPUC GO 95, Rules for Overhead Electric Line Construction, Section 35	Covers all aspects of design, construction, operation, and maintenance of overhead electrical lines and safety hazards.	The loop-in transmission line will adhere to all requirements of GO 95, as does the existing Southwest Powerlink.

12.2 Data Request DR WS-2

DR WS-2: Please provide a discussion of the necessity of constructing snake fences as part of the perimeter security fence and if included a description of those fences.

Response: The Project site would be enclosed with fencing that meets National Electric and Safety Code (NESC) requirements for protective arrangements in electric supply stations. The boundary of the Project site would be secured by up to 6-foot-high chain-link perimeter fences topped with 1 foot of three-strand barbed wire or other fencing as dictated by BLM and/or North American Electric Reliability Corporation (NERC) specifications. The fence would typically be installed approximately 100 feet from the edge of the solar arrays.

The fence does not include exclusion fencing for snakes. While it is possible for snakes to enter the site through the bottom gap of the fence, exclusion fencing for snakes is not required as snake sightings are expected to be very low due to the low number of operational workers on a large site. Training about snakes would be included in PDF HAZ-1, Worker Environmental Awareness Program (WEAP) which would be implemented prior to construction. The WEAP would include a PPE program, Emergency Action Plan (EAP), and IIPP to address health and safety issues associated with normal and unusual (emergency) conditions, including what to do in the event a snake is encountered during construction and operations. A biological monitor would also be on-site during construction who would regularly check for and remove snakes from solar sites during construction. Exclusion fencing for flat-tailed horned lizard may be included based on consultation with the BLM and wildlife agencies which would also exclude snakes; however, consultation is ongoing and measures to protect flat-tailed horned lizards are still being finalized.

12.3 Data Request DR WS-3

DR WS-3: Please state which BESS system will be chosen and if it will include internal heat removal, fire detection, and fire suppression systems. Please describe these systems in detail and also if automatic water addition to the electrolyte solution will be used.

Response: Design and layout of the facility and safety components will be determined as the engineering and design advances; but a schematic engineering drawing is included as Attachment L. The fire detection drawings for the Project BESS will be developed as detailed engineering continues. The BESS yard will have thermal detection cameras installed externally on battery containers and will be strategically placed in optimal locations to detect fires. These cameras will be remotely monitored 24 hours a day. Battery systems would require air conditioners or heat exchangers and inverters. In addition, a water tank for emergency use is anticipated for each BESS unit/area. The size, final number, and location of water tanks for emergency use would be determined in accordance with CFC during the final design process and would be reviewed/approved by the local or State Fire Marshal.

The BESS would comply with the current CFC, which governs the code requirements to minimize the risk of fire and life safety hazards specific to BESS used for load shedding, load sharing, and other grid services (Chapter 12 Section 1206 of the 2019 CFC). In accordance with the CFC, the battery enclosure and the site installation design are all required to be approved by the local or State Fire Marshal.

The BESS equipment selected for the Project will be tested pursuant to UL 9540A standards, and the Project will be designed and built pursuant to UL and NFPA codes. The BESS equipment to be used will be tested to demonstrate that they do not require built-in smoke, gas, or fire detection or suppression devices. The BESS equipment will be designed to minimize the risk of an over-pressure event and deflagration through the use of over-pressure vents and a sparker system. These safety features will be tested pursuant to UL 9540A standards to demonstrate their effectiveness in preventing deflagration in a large-scale fire.

12.4 Data Request DR WS-4

DR WS-4: Please provide more detailed information on the Fire, EMS, and rescue capabilities available from the Imperial County, El Centro, and BLM Fire Departments including response times.

Response: Additional information on the fire EMS, and rescue capabilities from the Imperial County, El Centro, and BLM Fire Departments has been added to Opt-In Application (see page 4.17-2). The text is provided below:

Fire Protection Services

Bureau of Land Management Fire Services
The Project Application Area is located within an area designated as a Federal Responsibility Area and a Local Responsibility Area. Agencies that would provide wildfire protection to the Project Application Area are the BLM Fire and the Imperial County Fire Department.

BLM Fire is directly responsible for fire management on more than 245 million acres. This land is commonly intermixed with other federal, state, and local jurisdictions, making partnerships and collaborative efforts crucial to the mission of safety and fire management. Overall, BLM Fire implements fire protection on approximately 650 million acres of public land with other fire management agencies. The local BLM Fire office to the Project Application Area is the BLM El Centro Field Office, which is responsible for responding to wildfires located within BLM Direct Protection Areas in conjunction with the Imperial County Fire Department. The El Centro Field Office manages approximately 1.4 million acres of public lands spread across two counties: Imperial and San Diego. Approximately 95% of the public lands lie within Imperial County. Because BLM land is commonly intermixed with other federal, State, and local jurisdictions, the BLM uses partnerships and collaborative efforts for fire management. BLM Fire consists of fire suppression, preparedness, predictive services, vegetative fuels management, community assistance and protection, and fire prevention through education (U.S. Bureau of Land Management, 2024).

BLM Fire also operates the Fuels Management program which conducts a wide variety of active management vegetation treatments using mechanical, biological, and chemical tools, and prescribed fire. The program includes creating fuel breaks to provide safe access for firefighters, reducing fuel loads by removing pinon-juniper and invasive species, reducing fire risk near communities, targeted grazing, and herbicide plus seeding to break the fire-cheatgrass cycle. Fuels treatments are planned and implemented in collaboration with other BLM programs, and with federal, state, local, and non-governmental collaborators (U.S. Bureau of Land Management, 2024).

Imperial County Fire Department
The Imperial County Fire Department is responsible for fire protection in unincorporated areas of the County. The Fire Department currently enforces the 2010 California Fire, Building, Electrical, County Ordinances, as amended by the County of Imperial Municipal Code, in

addition to National Fire Protection Association standards; Title 19, of the California Public Safety Code; and the California Health and Safety Code. To enhance its central core of firefighting personnel, the County has entered into contractual agreements with four incorporated cities and one special district for those agencies to provide fire suppression services to the unincorporated areas contiguous to their own jurisdictions. The county has fire stations in the townships/cities of Heber, Imperial, Niland, Ocotillo, Seeley, Palo Verde, and East County (Winterhaven). The nine Imperial County Fire Department stations are located in the communities of Heber, Seeley, Ocotillo, Palo Verde, Niland, Winterhaven, Salton City and the city of Imperial. The closest fire station to the Project site is located approximately 22 miles northwest, at 2514 La Brucherie Road, in the city of Imperial. Every station has a Type I engine as its primary apparatus. The City of Imperial and Heber stations also house a Ladder Truck along with the Type I engine. The Seeley and Heber stations also house Type III engines.

In addition to fire suppression, the Imperial County Fire Department provides mandatory fire and safety inspections of various businesses and facilities, arson investigations, medical responses, Basic Life Support/Advanced Life Support, hazardous device responses, heavy rescue services, hazardous materials incident response, airport fire/crash/rescue support, and mutual aid support to all other departments and special districts both locally and throughout the State of California.

El Centro Fire Department

The El Centro Fire Department staffs 3 fire stations, 24 hours a day, 7 days a week with a minimum of 10 personnel. Each station runs 1 Paramedic Assessment Unit and cross staffs additional rescue apparatus. The El Centro Fire Department is currently budgeted for 3 non-sworn staff members and 40 sworn positions. The El Centro Fire Department currently has the following fleets/apparatus: 5 fire engines; 1 aerial apparatus (75′ Quint); 2 rescue squad; 1 mobile air machine OES urban search and rescue type 2 trailer; and 1 hazardous material response unit (Countywide unit). The closest station is Station 2 located approximately 27 miles west of the Project site. Fire services would primarily be provided by BLM Fire and Imperial County Fire Department, but the El Centro Fire Department could provide assistance in the event of an emergency.

12.5 Data Request DR WS-5

DR WS-5: Please provide details and discussion on the measures which would be implemented to protect workers from exposure to Valley Fever.

Response: A discussion of the potential impacts associated with Valley Fever for Section 4.17, Worker Safety is provided below.

Impacts Associated with Valley Fever

Valley fever is a disease caused by a fungus (*Coccidioides immitis*) that infects a person by becoming airborne then entering the lungs. The fungus can grow naturally in soils and is found mainly in dry desert areas of the southwestern United States. The fungus becomes airborne when the ground is disturbed, and dust is spread into the air. People with jobs that require digging in the soil have the greatest chance of getting valley fever. Valley fever symptoms are similar to cold or flu symptoms. Most infected people get better without treatment, but those at higher risk for severe illness include pregnant women, people who have HIV infection, people who take medicines that weaken the immune system, and people who have diabetes.

Approximately 0 to 6 people per 100,000 people are expected to experience valley fever per year in Imperial County which is considered low (Centers for Disease Control and Prevention, 2020). In accordance with PDF HAZ-1, a WEAP would be prepared for the Project prior to construction. The WEAP would include a PPE program, EAP, and Injury and IIPP to address health and safety issues associated with normal and unusual (emergency) conditions. The WEAP would include environmental health and safety training including training on the potential hazards of valley fever, which, while low risk in Imperial County, would be discussed (e.g., symptoms, proper work procedures, how to use PPE, informing supervisor of suspected symptoms of valley fever. Fugitive dust generated during construction and decommissioning could expose workers to Coccidioides fungal spores that may be present in desert soils. As discussed in Section 4.1, Air Quality, a Fugitive Dust Control Plan (Appendix I.1 of the Opt-in Application) was prepared to ensure the Project's compliance with the ICACPD Regulation VIII Fugitive Dust Rules, which establish various strategies to limit the amount of fugitive dust emitted into the air during various construction activities. Project BMPs also include strategies to reduce fugitive dust that is the cause of PM_{10} emissions. BMP 7 requires that all access roads be surfaced with aggregate or be paved. BMP 8 requires that all unpaved roads and disturbed areas be watered or have soil binders applied to minimize fugitive dust generation. BMP 9 requires that all vehicles on site limit their speeds to 15 miles an hour, and BMP 10 requires that all vehicles transporting loose materials be covered and watered to prevent the material from causing fugitive dust. CMA LUPA Air-5 would ensure that a fugitive dust control plan be developed and implemented during construction activities. In addition, PDF AQ-1 requires the preparation and implementation of the Fugitive Dust Control Plan as well as other reasonable precautions to prevent all airborne fugitive dust plumes from leaving the Project Application Area and to prevent visible particulate matter from being deposited upon public roadways. The DRECP LUPA CMAs, BMPs, PDFs, and Fugitive Dust Control Plan measures comprise all measures that could reasonably be implemented to control fugitive dust during Project construction. With implementation of dust control measures, the effects from valley fever would not be adverse.

13 References

Centers for Disease Control and Prevention. (2020, May 21). *Valley Fever Maps*. Retrieved from Surveillance for Valley fever cases: https://www.cdc.gov/fungal/diseases/coccidioidomycosis/maps.html#surveillance

National Center for Education Statistics. (2023). *Holtville Unified*. Retrieved from Search for Public School Districts: https://nces.ed.gov/ccd/districtsearch/district_detail.asp?ID2=0617430

U.S. Bureau of Land Management. (2013a). *Night Sky and Dark Environments: Best Management Practices for Artificial Light at Night on BLM-Managed Lands.*

U.S. Bureau of Land Management. (2024, 05 01). *BLM Fire Program*. Retrieved from https://www.blm.gov/programs/fire

U.S. Bureu of Land Management. (2013b). *Best Management Practices for Reducing Visual Impacts of Renewable Energy Facilities on BLM-Administered Lands.*

Attachment A Air Quality Correspondence, Air Quality Technical Report, and Generator Spec Sheet (DR AQ-1, DR AQ-3, DR AQ-6, DR AQ-8)

Attachment A.1 Correspondence with Imperial County Air Pollution Control District (DR AQ-1)

PANORAMA
ENVIRONMENTAL, INC.

Meeting Notes

Date:	May 1, 2024 9:00 AM
Location:	Zoom Call
Project	Perkins Renewable Energy Project
Attendees	Monica Soucier, ICAPCD, Division Manager Patrick Sutton, Baseline Logan Nonnez, IP Emily Capello, Panorama Camille Wasinger, IP Susanne Heim, Panorama
Subject:	**Imperial County Air Pollution Control District Permitting**

Action Items

Action	Responsible Party	By When?
Send information re MM for NOx Send information re PM10 for enhanced Dust Control Plan Send information re Operational Dust Control Plan	Monica Soucier, ICAPCD	Week of 5/6 *See attached emails*
Confirm with ICAPCD Policy 5 fee costs for construction phase NOx threshold exceedance	Logan Nonnez	Week of 5/6
Send revised Opt-in Data to County	IP/Panorama	June/July 2024

Notes

Introduction

- Brief introductions
- Camille provided a brief background on the permitting pathway for the Perkins project. IP submitted an Opt-in application to the CEC in February 2024, CEC will be the CEQA lead agency under the AB 205 streamlined CEQA process. CEC subsumes local permits.
- Camille noted that IP’s team will send ICAPCD the air quality tech report and resource analysis section.

- Camille noted that IP would like to discuss two topics with the ICAPCD:
  - The Project requires a small emergency backup generator during operations for substation and O&M but will have a distribution feed normally. The CEC said that IP can either work with the ICAPCD to pull the necessary permit for that generator or the CEC can engage with the Air District to get the information for that permit in the Opt-in Permit process.
  - Potential mitigation for 3 emission sources that could be over the CEQA thresholds during construction: NOX, PM10, and CO.

Emergency Backup Generator Permit

- Monica noted that the CEC has no authority to issue permits under Air District for backup generators. Monica noted that given the size and type of emergency generator (diesel vs propane powered), it may or may not require a permit. Propane generators might be exempt from permit requirements, diesel generators would require a permit.
- Emergency generators are included on an inspection list. The user takes note of hours used and if use goes above the hours allowed, then operators have to comply with the ICAPCD requirements. Monica noted that Rule 202 describes what is exempt from permitting. If the project is required to have a permit then the permitting process can start now but the authority to construct would not be issued until the CEC issued its final Staff Assessment. The rules require that the ICAPCD file a NOD for the permit and the ICAPCD would use the CEC documentation for NOD.
- Monica noted that permitting forms are on the IC website and there is a supplemental form for the engine as part of the permit application.
- APCD noted that IP can file the application at any time but the APCD would not issue the authority to construct until CEC has completed its process. Then, if the emergency generator meets the County's conditions it reverts to a Permit to Operate.
- Monica noted that County Rule 101 defines affected pollutants which need to be considered for the emergency generator permit. NOx, OX, VOCs, some toxics.

Potential Mitigation

- Camille explained that three emissions are over the CEQA threshold of significance during construction: PM10, NOx, and CO. Driver for being over on CO is using Tier 4 equipment.
- Camille noted that Imperial County is not in non-attainment for CO and that the CEQA threshold is for non-attainment pollutants.
- Monica noted that Imperial is unclassified for CO, EPA has a requirement that if you don't request to be in attainment, you remain unclassified. Under a CEQA evaluation, EPA is looking at Imperial to make sure a project does not cause an exceedance of the standard or increase the standards. Noted that you could look at

the general conformity under federal guidance for CO – if showing that the project's contribution above the threshold does not cause exceedance then the project can use reasonable measures.

- Both CEQA and EPA use general conformity regulation under federal guidance to determine significance of CO. If determine significant, air district would accept an evaluation of whether the excess CO would cause or contribute to a violation of the standard. Patrick asked whether it would be like doing a hot spot analysis?
- Monica – agreed that was a good way to think about it. Noted that if Imperial County were to be classified in attainment, it would fall into the PSD program, prevention of significance discussion, per the EPA. Imperial County would demonstrate that all projects are not contributing to a violation or causing a violation. Threshold for CEQA can be used to consider anything above that threshold.
- Camille clarified that there would not be new or increased CO impacts to the region as a whole. Exceeded Standard 1 in a 5 year period, would not increase that violation. If did dispersion modeling, would that show that CO is not a concern?
- Patrick noted that instead of doing a detailed dispersion modeling, they are planning on doing a screening analysis and could include CO in that screening analysis as well. This would look at nearest receptor for these pollutants.
- Monica – typically APCD looks at whether the project would cause an exceedance in general rather than at a receptor and she would think about this option.
- Patrick asked how the County reports estimates of pollutants. Shared breakdown of pollutants – 3 different scenarios for how we can calculate and report average daily emissions.
- Monica – Noted the County would typically look at the first scenario shared: which was the average emissions over the construction period. But the County will include a qualitative discussion of scenario 3 – peak emissions. The County doesn't include quantification of the peak emissions.
- Patrick – Noted this would narrow down mitigation concerns to PM10.
- Monica – Clarified that the County does have a policy for solar projects to address NOx and PM10. Because of the nature of solar projects, the actual construction schedule is often shorter than analyzed under CEQA. Therefore, the County requires all solar projects to include as mitigation for NOx, that the developer submit monthly construction equipment use to the air district reporting offroad equipment by make, model, horsepower and hours used. That way the County can do a NOx evaluation to compare with what was evaluated in the CEQA document. If the actual construction exceeds the construction emissions, then the County applies Policy 5.
- Camille requested example language used by the County for NOx mitigation.
- Monica will send example mitigation from previous projects. *See follow up emails.*

- Monica noted that in Imperial County most construction projects are above thresholds for PM10. The County requires the developers to draft an enhanced Dust Control Plan. For each project this might be different –for example, typically a Dust Plan will note that if wind gusts exceed 25 mph, cease or put more water. The enhanced Dust Control Plan might require this for wind speeds peaking at 25 mph. The Dust Control Plan will require submittals of reports showing the frequency of the mitigation. How are you keeping track of wind speeds.
- Camille requested standard language on the Dust Control Plan. *See follow up emails.*
- Monica noted that one thing that Imperial Valley has is cumulative impacts from PM 10. Historically the County has required an Operational Dust Control Plan. The County has a white paper on Operational Dust Control Plan that Monica will share. She noted that maps are really important: what the facility looks like, what is gated, paved, wind flow patterns through a site on any given day.
- The IP team will make updates to Opt-in Application and circle up with Monica

Gmail

Emily Capello <emily.capello@panoramaenv.com>

RE: Perkins Renewable Energy Project - IP/ICAPCD Discussion

Emily Capello <emily.capello@panoramaenv.com> Thu, May 23, 2024 at 8:20 AM
To: Monica Soucier <MonicaSoucier@co.imperial.ca.us>
Cc: Camille Wasinger <camille@intersectpower.com>, Logan Nonnez <logan.nonnez@intersectpower.com>, "susanne.heim@panoramaenv.com" <susanne.heim@panoramaenv.com>, "jenna.savois@panoramaenv.com" <jenna.savois@panoramaenv.com>, Jesus Ramirez <JesusRamirez@co.imperial.ca.us>, "patrick@baseline-env.com" <patrick@baseline-env.com>, Ismael Garcia <ismaelgarcia@co.imperial.ca.us>

Hi Monica -

Thank you - we really appreciate your input!

Emily

On Thu, May 23, 2024 at 7:48 AM Monica Soucier <MonicaSoucier@co.imperial.ca.us> wrote:

> Emily
>
> My apologies and thank you for reminding me. First let me say that the example you provided is fine however, there needs to be a tie between the result of the level of significance and the reason for the measure.
>
> 1. Finding the NOx during construction has a LTSI is not uncommon. Further, the Air District has vast experience with the actual construction of solar projects that do not conform to the environmental assessment scenario. For example, the construction air emissions worst case scenario evaluation in an EIR/EIS typically uses a longer period of time for the construction (i.e. 2 years) thus allowing for a smaller off road equipment fleet mix. The actual construction then is changed, due to say time limited power purchase agreements and now the construction goes from a 2 year span to a 1 year span and a larger more condensed off road fleet.
>
> - Thus the Air District will look for language that explains the above and that in order to assure NOx emissions do not exceeded the construction threshold the submittal of construction equipment by Make, Model, Horsepower, Quantity and actual hours of use will be provided to the Air District in periodically (to be determined between the Air District and the applicant) so that a NOx evaluation can be performed. Should emissions exceed the NOx threshold then compliance with Policy 5 will be required.
>
> 2. As to the enhanced dust control plan for Construction. Regulation VIII rules were approved by the United States Environmental Protection Agency (US EPA) on April 22, 2013 as implementing Best Available Control Measures or BACM. Subsequently, the Air District began analyzing both controllable and uncontrollable sources of emissions. As such the Air District was successful in demonstrating that as written Regulation VIII rules assist in keeping control over sources including area sources, open areas and construction sites. However, indirect sources resulting from natural events, such as low-pressure storms, remain a potentially uncontrolled source of emissions that affect Imperial County, specifically re-entrained dust emissions resulting from natural event occurrences. Thus, for any construction site the air district cannot concur with modeling of emissions that uses 100% mitigation because of the use of paved roads, exclusively. This has cause many project to continue to exceed the construction threshold for PM10. Thus, an enhanced dust control plan utilizing measures, approved by the Air District, assure that the construction site will more than likely address those re-entrained emissions. Measures such as, ceasing

construction operation when wind speeds (not gust) exceed 25 mph until wind speeds reduce for one hour below 25 mph.

Emily I hope this helps.

IMPERIAL COUNTY
AIR POLLUTION CONTROL DISTRICT

Monica N. Soucier, MSL

APC Division Manager

Planning and Monitoring

150 S 9th Street

El Centro, CA 92243

P. 442.265.1800

F. 442.265.1799

From: Emily Capello <emily.capello@panoramaenv.com>
Sent: Thursday, May 23, 2024 6:03 AM
To: Monica Soucier <MonicaSoucier@co.imperial.ca.us>
Cc: Camille Wasinger <camille@intersectpower.com>; Logan Nonnez <logan.nonnez@intersectpower.com>; susanne.heim@panoramaenv.com; jenna.savois@panoramaenv.com; Jesus Ramirez <JesusRamirez@co.imperial.ca.us>; patrick@baseline-env.com
Subject: Re: Perkins Renewable Energy Project - IP/ICAPCD Discussion

CAUTION: This email originated outside our organization; please use caution.

Hi Monica,

Apologies - one more question. Could you provide us with an example of a project that estimated a LTS impact for NOx emissions during construction, but included a caveat that ICAPCD may still require implementation of Policy #5 based on actual construction emissions? Alternatively, here is some text we've prepared that you could review and let us know your thoughts or modify if needed.

> Although NOx emissions would be below the threshold, it should be noted that the ICAPCD requires large construction projects to submit monthly reports of equipment activity to calculate actual NOx emissions and if the average daily emissions exceed the ICAPCD's threshold of significance, then the Project applicant may be required to comply with ICAPCD Policy Number 5, "Off-site Mitigation/In-lieu Fee". Policy Number 5 requires the applicant to prepare and implement the following mitigation measures, as approved by the ICAPCD, to reduce construction emissions of NOx below the threshold of significance:
>
> 1) Propose an off-site mitigation project providing supporting documentation that the reductions are met, or
>
> 2) Pay an in-lieu mitigation fee in accordance with the ICAPCD's Off-Site Mitigation/In-Lieu Fee Policy.

Thank you so much for your time!

On Wed, May 22, 2024 at 3:23 PM Emily Capello <emily.capello@panoramaenv.com> wrote:

> Hi Monica -
>
> I just wanted to see if you had been able to find any examples of the Enhanced Dust Control Plan you'd be able to share?
>
> Thank you!
>
> On Wed, May 15, 2024 at 8:01 AM Monica Soucier <MonicaSoucier@co.imperial.ca.us> wrote:
>
> > Emily
> >
> > My apologies, I was out sick for over a week but the language below is ok. I came back to work on May 10th and I have been spending my time catching up. I will respond by tomorrow.
> >
> > ICAPCD IMPERIAL COUNTY AIR POLLUTION CONTROL DISTRICT
> >
> > Monica N. Soucier, MSL
> >
> > APC Division Manager
> >
> > Planning and Monitoring
> >
> > 150 S 9th Street

El Centro, CA 92243

P. 442.265.1800

F. 442.265.1799

From: Emily Capello <emily.capello@panoramaenv.com>
Sent: Tuesday, May 14, 2024 3:55 PM
To: Camille Wasinger <camille@intersectpower.com>
Cc: Monica Soucier <MonicaSoucier@co.imperial.ca.us>; Logan Nonnez <logan.nonnez@intersectpower.com>; susanne.heim@panoramaenv.com; jenna.savois@panoramaenv.com; Jesus Ramirez <JesusRamirez@co.imperial.ca.us>; patrick@baseline-env.com
Subject: Re: Perkins Renewable Energy Project - IP/ICAPCD Discussion

Hi Monica -

Were you able to find Imperial County's language regarding NOx and an enhanced PM10 Dust Control Plan?

I found this language in the recent Brawley Solar Energy Facility Project EIR regarding NOx mitigation.

AQ-2 Construction Equipment. Construction equipment shall be equipped with an engine designation of EPA Tier 2 or better (Tier 2+). A list of the construction equipment, including all off-road equipment utilized at each of the projects by make, model, year, horsepower and expected/actual hours of use, and the associated EPA Tier shall be submitted to the County Planning and Development Services Department and ICAPCD prior to the issuance of a grading permit. The equipment list shall be submitted periodically to ICAPCD to perform a NOx analysis. ICAPCD shall utilize this list to calculate air emissions to verify that equipment use does not exceed significance thresholds. The Planning and Development Services Department and ICAPCD shall verify implementation of this measure.

Would this be a good example?

I wasn't able to find an enhanced PM10 Dust Control Plan but the EIR for the Brawley Solar Energy Facility Project did have mitigation for Fugitive Dust Control, Dust Suppression, and an Operational Dust Plan. If you have an example enhanced Dust Control Plan, that would be very helpful.

Thank you!

Emily

On Wed, May 1, 2024 at 10:52 AM Camille Wasinger <camille@intersectpower.com> wrote:

Thank you so much, Monica!

Best,

Camille

::

Camille Wasinger
Senior Director, Environmental & Permitting
INTERSECT POWER
(c) 303.909.6396
(e) camille@intersectpower.com

www.linkedin.com/in/camillewasinger

On Wed, May 1, 2024 at 11:50 AM Monica Soucier <MonicaSoucier@co.imperial.ca.us> wrote:

Here is the white paper for the Operational Dust Control Plan

I will look for language regarding to NOx and an enhanced PM10 Dust Control Plan

ICAPCD IMPERIAL COUNTY AIR POLLUTION CONTROL DISTRICT

Monica N. Soucier, MSL

APC Division Manager

Planning and Monitoring

150 S 9th Street

El Centro, CA 92243

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-----Original Appointment-----
From: Logan Nonnez <logan.nonnez@intersectpower.com>
Sent: Thursday, April 18, 2024 9:08 AM
To: Logan Nonnez; Camille Wasinger; susanne.heim@panoramaenv.com; emily.capello@panoramaenv.com; jenna.savois@panoramaenv.com; Jesus Ramirez; Monica Soucier; patrick@baseline-env.com
Subject: Perkins Renewable Energy Project - IP/ICAPCD Discussion
When: Wednesday, May 1, 2024 9:00 AM-10:00 AM America/Los_Angeles.
Where:

When

9am – 10am·Wednesday May 1, 2024
(Pacific Time - Los Angeles)

Guests

- organizer Logan Nonnez

Camille Wasinger

susanne.heim@panoramaenv.com

Join Zoom Meeting
intersectpower.zoom.us/j/8711116...
ID: 87111164796
passcode: 277530

Join by phone

+1 833-928-4608(US)
passcode: 277530

Joining instructions

emily.capello@panoramaenv.com

jenna.savois@panoramaenv.com

jesusramirez@co.imperial.ca.us

monicasoucier@co.imperial.ca.us

patrick@baseline-env.com

View all guest info

Joining notes

Meeting host:
Logan.Nonnez@intersectpower.com

Join Zoom Meeting:
https://intersectpower.zoom.us/j/87111164796?pwd=btGMYFgrUix8luoNubOnRzDeXGNf2A.1

monicasoucier@co.imperial.ca.us for **Reply**

Maybe | No | Yes

More options

Invitation from Google Calendar

You are receiving this email because you are an attendee on the event. To stop receiving future updates for this event, decline this event.

Forwarding this invitation could allow any recipient to send a response to the organizer, be added to the guest list, invite others regardless of their own invitation status, or modify your RSVP. Learn more

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Emily Capello, Senior Manager
Panorama Environmental, Inc.

https://www.panoramaenv.com/

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Attachment A.2 Revised Air Quality Technical Report July 2024 (DR AQ-1, DR AQ-6, DR AQ-8)

Air Quality Technical Report

15 July 2024

PERKINS RENEWABLE ENERGY PROJECT
Imperial County, California

For:
Panorama Environmental, Inc.
San Francisco, California

21215-07

BASELINE
ENVIRONMENTAL CONSULTING

AIR QUALITY TECHNICAL REPORT

15 JULY 2024

PERKINS RENEWABLE
ENERGY PROJECT
Imperial County, California

For:
Panorama Environmental, Inc.
San Francisco, California

By:

BASELINE
ENVIRONMENTAL CONSULTING

Prepared By: ______________________ **Date:** __________

Patrick Sutton
Principal Environmental Engineer

TABLE OF CONTENTS

APPENDICES

FIGURE

TABLES

AIR QUALITY TECHNICAL REPORT

PERKINS RENEWABLE ENERGY PROJECT
Imperial County, California

1. INTRODUCTION

Baseline Environmental Consulting has prepared this Air Quality Technical Report for the Perkins Renewable Energy Project (Project) in Imperial County, California. The purpose of this technical report is to support environmental review of the Project under the California Environmental Quality Act (CEQA), as well as the California Energy Commission's (CEC) Opt-in application for certification (AFC) program for licensing power plants (20 CCR, Div. 2, Ch. 5 App. B). This report describes the methodology and results for evaluating potential air quality and greenhouse gas (GHG) impacts from implementation of the proposed Project.

1.1 Project Description

IP Perkins, LLC (Applicant) and IP Perkins BAAH, LLC, subsidiaries of Intersect Power, LLC, propose to construct, operate, maintain, and decommission a 1,150 megawatt (MW) solar photovoltaic (PV) facility and battery energy storage system (BESS) on public lands administered by the U.S. Bureau of Land Management (BLM) and Bureau of Reclamation, as well as private lands located approximately 16 miles southeast of El Centro in Imperial County, California (**Figure 1**).

A fenced area referred to as the "Project site" would contain the solar plant, BESS, Project interconnection generation tie (gen-tie) line, Project substation, and operations and maintenance (O&M) yard and facility. The Project site would be constructed, owned, and operated by IP Perkins, LLC. The Project would also include a high-voltage breaker-and-a-half switchyard (BAAH switchyard) and two 500 kilovolt (kV) loop-in transmission lines, each within a 200-foot-wide loop-in transmission corridor, that would be required to interconnect to the existing San Diego Gas and Electric (SDG&E) Southwest Power Link (SWPL) 500 kV transmission line that traverses east–west to the south of the Project site. The BAAH switchyard would be constructed by IP Perkins BAAH, LLC and owned and operated by SDG&E, in coordination with Imperial Irrigation District (IID). San Diego Gas and Electric (SDG&E) would construct the two 500 KV loop-in transmission lines, which SDG&E would own, in coordination with IID, upon completion of construction. Together the Project site, the BAAH switchyard, and the 500 kV loop-in transmission corridors are referred to as the "Project Application Area" in the AFC (**Figure 2**).

The Project Application Area is in Imperial County, approximately 37 miles southeast of the Salton Sea. Imperial County is located in southern California, in the southwestern portion of the Colorado Desert. The Project Application Area is located approximately 1.2 miles north of the

Figure 1. Regional Setting

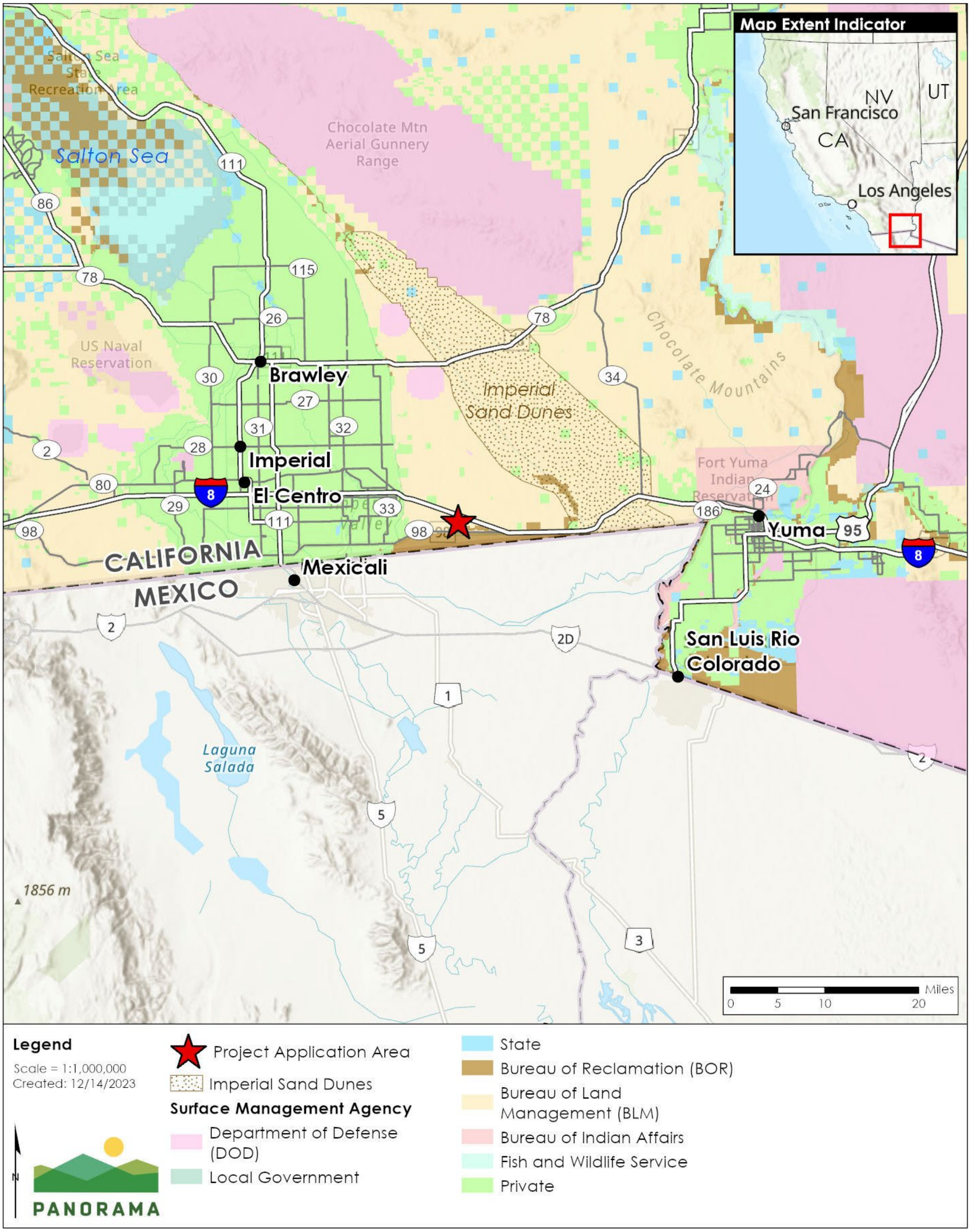
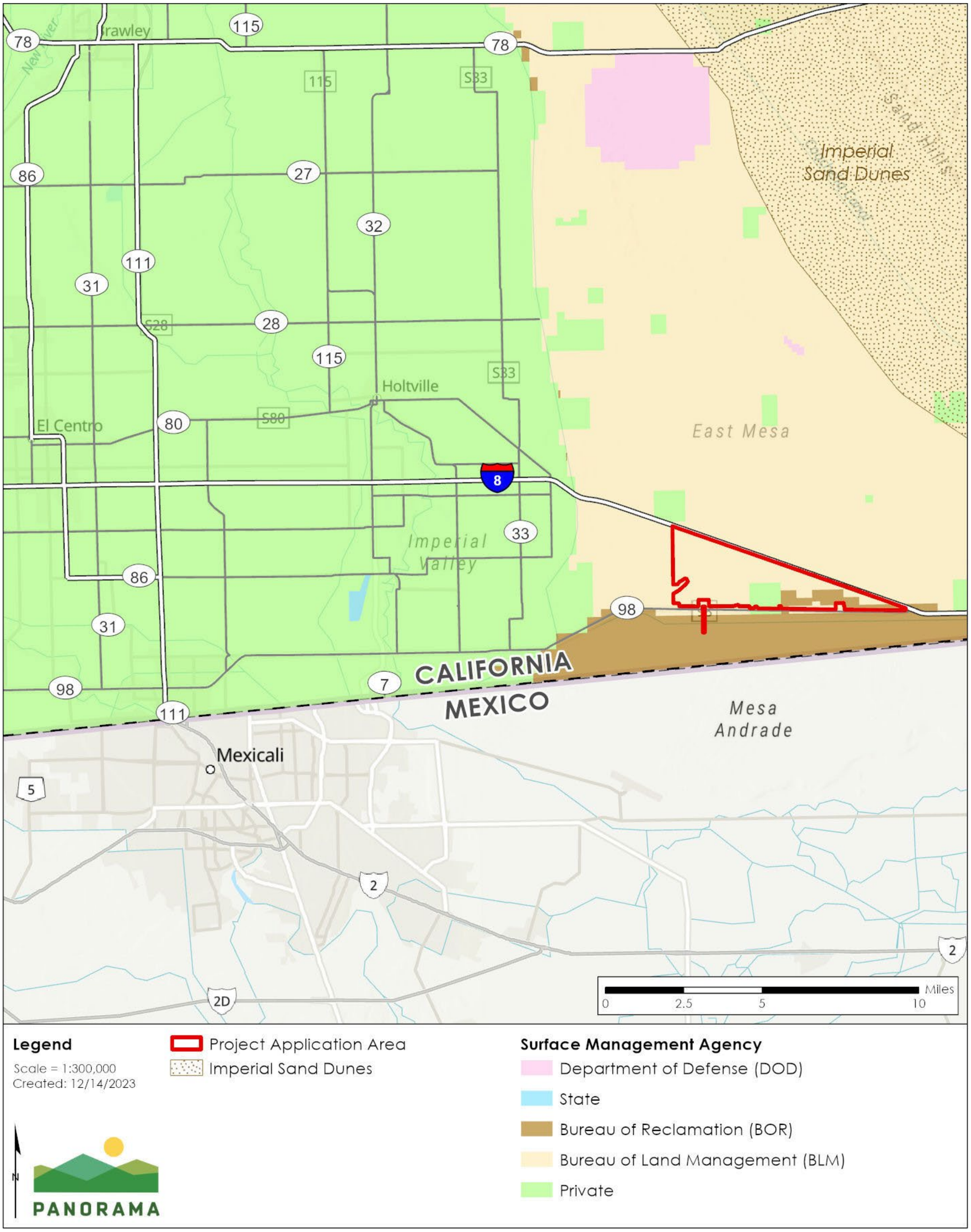


Figure 2. Project Vicinity



U.S.–Mexico border, in a region characterized by undeveloped desert and agricultural uses. The Imperial Valley, which is dominated by agricultural land, is located an estimated 2.5 miles west of the Project Application Area. The Imperial Sand Dunes, the largest mass of sand dunes in California, is located approximately 9 miles east of the Project Application Area.

1.1.1 Solar Facility Description

The Project site layout, including the solar PV facility, BESS, substation, and transmission facilities are shown in **Figure 3**. The solar facility includes the following components:

- Solar PV arrays
- Inverter-transformer stations and electrical collector lines
- BESS
- Operation and maintenance facilities
- Monitoring and telecommunication facilities
- Access roads
- Security fencing and lighting
- Septic system
- Emergency and auxiliary facilities

The Project also includes the Project substation, BAAH switchyard, and two 500 kV loop-in lines. **Table 1** lists the approximate acreages associated with each Project component for the Project site.

Table 1. Estimated Development Area for the Solar Site Permanent Components

Project Component	Approximate Acreage
Fenced solar PV facility with arrays, inverters, transformers, and internal access roads	5,985
BESS	35
Operation and maintenance yard and facility	10
Temporary parking and laydown areas	≤ 25

1.1.2 Solar Facility Construction

The majority of the Project site would be mowed rather than cleared of vegetation. Mass grading of the Project site would not be needed for site preparation due to the relatively flat terrain. Spot grading would be employed for select solar array and storage facility components, including the BESS, substation, BAAH foundations, and access road locations. All applicable best management practices (BMPs), Project Design Features, and Desert Renewable Energy Conservation Plan (DRECP) Conservation and Management Actions (CMAs) would be implemented during all grading, vegetation removal, and construction activities.

The BESS, operation and maintenance facility, and roads would require vegetation clearing, grading, and compaction. Inverter-transformer station locations would require light grubbing. Due to undulations within the Project site, some areas of grading would be needed within the solar arrays. Where solar site grading is necessary for discrete facilities or within the solar arrays, cut and fill would be balanced to the extent feasible. Some import and export of material would be necessary (**Table 2**). Where excavation is required, most construction activities would be limited to less than 6 feet in depth within the Project Site; however, some excavations, such as those undertaken for the installation of loop-in transmission line structures, may reach depths of 45 feet or more.

Within the solar arrays that do not require grading, mowing and grubbing would be conducted to allow for construction access and installation. Mowing and grubbing involves surface removal of vegetation, including mechanical mowing and removal of larger vegetation by hand cutting/trimming to the ground surface. The intent is to leave root balls and seeds in place to allow for regrowth of native vegetation after construction. During mowing, collection of mowed vegetation would be considered for future mulching to minimize dust and soil erosion on portions of the site and enhance restoration. A qualified restoration biologist would determine where the collected mulching material should be applied.

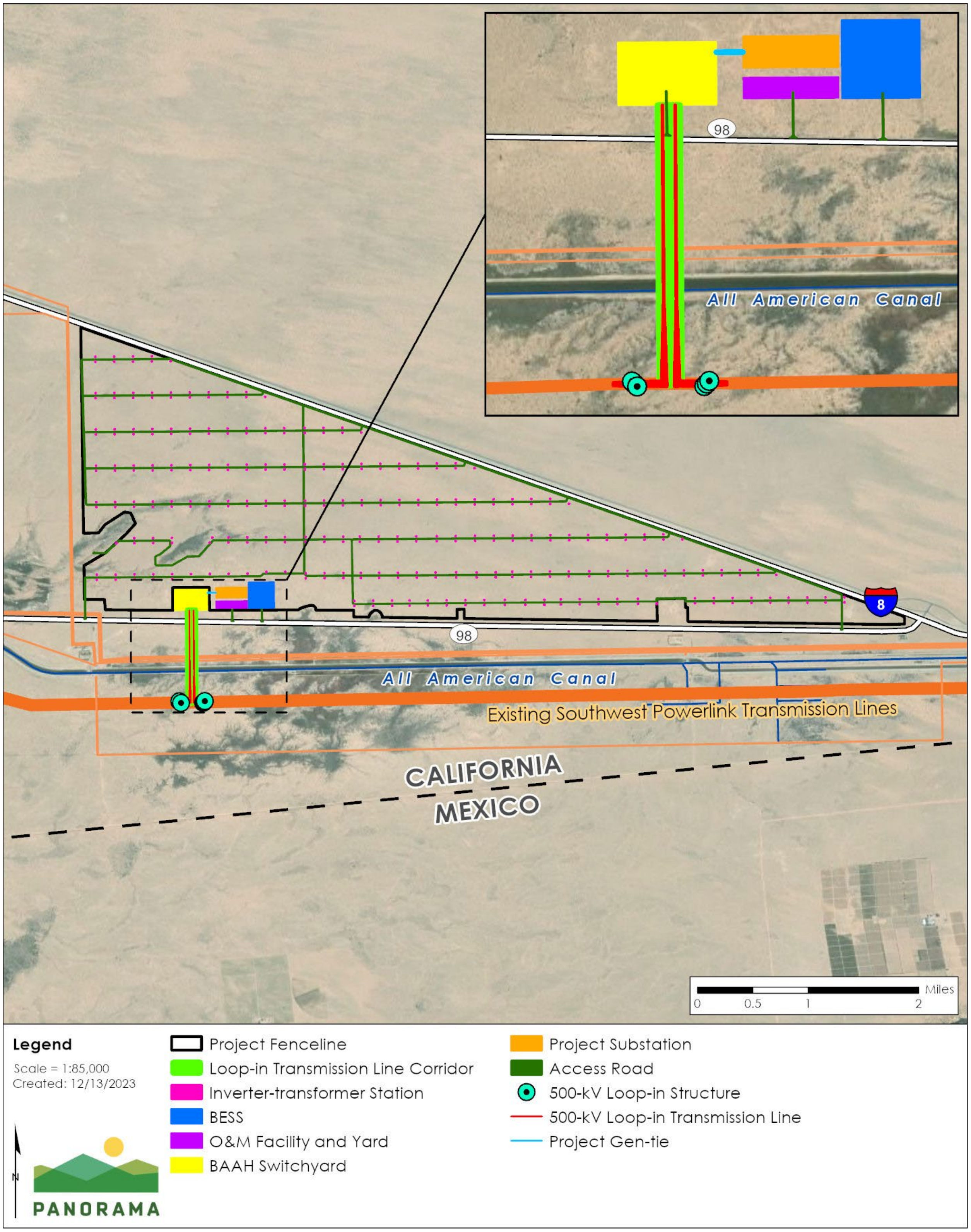
Non-native vegetation would be removed to the extent feasible during the construction phase via manual and mechanical methods and herbicide application. Any non-native species found in the Project Application Area that has not been evaluated for its potential to invade or alter surrounding natural lands would be considered a “weed” for purposes of the Restoration and Integrated Weed Management Plan implementation. Cutting, damaging, or uprooting microphyll woodland tree species would be avoided by Project design and BMPs, in accordance with the CMAs.

Table 2. Solar Facility Disturbance Details

Project Component	Cut/Fill Quantity	Type of Disturbance
Fenced solar facility with arrays and access roads	Balanced	Solar array areas to be mowed and grubbed to provide for construction access and installation
Inverter-transformer stations and electrical collection system	Balanced	Graded and backfilled to an elevation above surrounding grade to avoid flooding for inverter-transformer stations
BESS	54,466 cubic yards of import [a] material; excess soils from storm water basin excavations to also be used	Graded and backfilled to an elevation above surrounding grade to avoid flooding
Operation and maintenance yard and facility	Balanced	Operation and maintenance site to be graded and compacted
Temporary parking and laydown	Balanced	Temporary parking and laydown areas to be graded and compacted

Note:
[a] Estimated base for the areas requiring import of material is assumed to require a 12-inch depth.

Figure 3. Project Layout



Note: The project layout is approximate and may be subject to change.

1.1.3 Transmission System Description

The transmission system would include the following components:

- Substation(s)
- Project gen-tie lines
- BAAH switchyard
- 500 kV loop-in transmission lines

Table 3 lists the acreages associated with each Project component for the transmission system and lines. The area within the project substation and BAAH switchyard will be stabilized with gravel and Project facilities. The disturbance acreage for the gen-tie lines and loop-in transmission lines include temporary disturbance areas for construction.

Table 3. Estimated Disturbance Area for the Transmission System Permanent Components

Proposed Component	Approximate acreage
Project substation	20
Project gen-tie lines	1
BAAH switchyard	40
500 kV loop-in transmission lines	≤ 35

1.1.4 Transmission Facility Construction

The transmission system components would require grading and excavation for installation and construction. Import of soil would be needed for several of the components, as detailed in **Table 4**.

Table 4. Transmission System Grading and Excavation Details

Project Component	Cut/Fill Quantity	Type of Disturbance
Project substation [b]	32,266 cubic yards of import [a] material; excess soils from storm water basin excavations to also be used	Graded and backfilled to an elevation above surrounding grade to avoid flooding
BAAH switchyard	88,732 cubic yards of import [a] material on BLM land; excess soils from storm water basin excavations to also be used;	Graded and backfilled to an elevation above surrounding grade to avoid flooding
500 kV loop-in transmission lines	Balanced	Excavation for structure installation; grading for access roads

Note:

[a] Estimated base for the areas requiring import of material is assumed to require a 12-inch depth.

[b] Additional import may be needed if a second substation is constructed.

2. ENVIRONMENTAL SETTING

2.1 Regional Climate, Meteorology, and Topography

The Project site is located in the southern part of the Salton Sea Area Air Basin (SSAB). Air basins have natural characteristics that limit the ability of natural processes to either dilute or transport air pollutants. The major determinants of air pollution transport and dilution are climatic and topographic factors such as wind, atmospheric stability, terrain that influences air movement, and sunshine. Wind and terrain can combine to transport pollutants away from upwind areas, while exposure to sunshine can chemically transform pollutants in the air to create secondary photochemical pollutants such as ozone.

The SSAB is comprised of Imperial County and a portion of Riverside County. As an arid desert region, the SSAB climate is largely governed by the large-scale sinking and warming of air within the semi-permanent subtropical high-pressure center over the Pacific Ocean. When the fringes of mid-latitude storms pass through the Imperial Valley in winter, the coastal mountains create a strong “rain shadow” effect that makes Imperial Valley the second driest location in the U.S.

Imperial County experiences average temperatures as high as about 106 degrees (°) Fahrenheit in the summer and as low as of 40° Fahrenheit in the winter. The annual precipitation in this region is 2.9 inches, which mostly occurs during the months of December to March (U.S. Climate Data, 2024). Due to temperature inversions and light nighttime winds, local air pollution emissions can become trapped near the ground. The area is subject to frequent hazy conditions at sunrise, followed by rapid daytime dissipation as winds pick up and the temperature warms. During periods of strong solar heating and intense convection, turbulent motion creates good mixing and low levels of air pollution. Imperial County experiences surface inversions almost every day of the year. These inversions often last for long periods of time, which allows for air stagnation and buildup of pollutants, including ozone.

Winds in the area are driven by a complex pattern of local, regional, and global forces, but primarily reflect the temperature difference between the cool ocean to the west and the heated interior of the entire desert southwest. For much of the year, winds flow predominantly from the west to the east. In summer, intense solar heating in the Imperial Valley creates a more localized wind pattern, as air comes up from the southeast via the Gulf of California.

2.2 Air Pollutants of Concern

The California Air Resources Board (CARB) and United States (U.S.) Environmental Protection Agency (EPA) focus on the following air pollutants as regional indicators of ambient air quality:

- Ozone (O_3)
- Coarse particulate matter (PM_{10})
- Fine particulate matter ($PM_{2.5}$)
- Nitrogen dioxide (NO_2)
- Carbon monoxide (CO)

- Sulfur dioxide (SO_2)
- Lead

Because these are the most prevalent air pollutants known to be harmful to human health based on extensive criteria documents, they are referred to as "criteria air pollutants." In Imperial County, the primary criteria air pollutants of concern are ground-level ozone, which is formed through reactions of oxides of nitrogen (NOx) and reactive organic gases (ROG), PM_{10}, and $PM_{2.5}$. These regional air pollutants can be formed and/or transported over long distances and affect ambient air quality far from the emissions source. Imperial County is predominately agricultural land, which is a major factor in the regional ambient air quality levels. Agricultural production generates fugitive PM_{10} emissions (i.e., dust) from the use of agricultural equipment on unpaved roads, land preparation, and harvest practices. As a result, Imperial County experiences unhealthful air quality from the formation of ground-level ozone, including photochemical smog, and fugitive PM_{10} because of the agricultural activities and very arid climate. The magnitude and location of specific health effects from exposure to increased ozone and PM_{10} concentrations are the result of emissions generated throughout Imperial County, as opposed to a single project.

The Imperial County Air Pollution Control District (ICAPCD) and other air districts use regional air dispersion models to correlate the cumulative emissions of regional pollutants to potential community health effects. However, these dispersion models have limited sensitivity to the relatively small (or negligible) changes in criteria air pollutant concentrations associated with an individual project. Therefore, it is not feasible to provide reliable estimates of specific health risks associated with regional air pollutant emissions from an individual project.

The ICAPCD operates a network of air monitoring stations throughout Imperial County to monitor ambient levels of criteria pollutants such as ozone, PM_{10}, and $PM_{2.5}$. **Table 5** presents a five-year summary for the period from 2018 to 2022 of the highest annual concentrations of ozone, PM_{10}, and $PM_{2.5}$ measured at the two nearest monitoring stations:

- Calexico-Ethel Street located about 16 miles southwest of the Project site; and

- El Centro-9th Street located about 20 miles northwest of the Project site.

The Brawley station is the third closest monitoring station to the Project site, but the station has been closed since 2009. The fourth closest station, Westmorland, is about 35 miles northwest of the Project site and is not considered representative of the Project site conditions due its distance and location near the Salton Sea.

Table 5 compares the measured pollutant concentrations at the nearby monitoring stations with applicable State and federal ambient air quality standards, which are discussed further under Regulatory Framework, below. As shown in **Table 5**, the ozone concentrations are relatively similar at both monitoring stations; however, the PM_{10} and $PM_{2.5}$ concentrations are substantially higher at the Calexico Station than the El Centro Station. This is because the city of Calexico shares a border with the densely populated city of Mexicali, Mexico, whose metropolitan area has more than five times the population of Imperial County. Both the Project site and the El Centro station are located about 10 miles away from the city of Mexicali; therefore, the ambient criteria air pollutant data collected at the El Centro station are likely the most representative of the Project site conditions.

Table 5. Regional Air Quality Trends

Pollutant	Standard	2018	2019	2020	2021	2022
Calexico-Ethel Street Station						
Ozone	Max 1-hour Concentration (ppm)	0.103	0.106	0.107	0.122	0.097
	Days > CAAQS (0.09 ppm)	2	4	6	4	1
	Max 8-hour Concentration (ppm)	0.084	0.089	0.087	0.090	0.083
	Days > CAAQS (0.070 ppm)	10	18	19	14	7
	Days > NAAQS (0.070 ppm)	9	17	16	13	6
Coarse Particulate Matter (PM_{10})	Max 24-hour Concentration (µg/m^3)	419.0	146.1	194.5	301.1	184.8
	Days > CAAQS (50 µg/m^3)	*	112.0	166.3	150.7	163.9
	Days > NAAQS (150 µg/m^3)	9.3	0.0	4.0	3.0	2.0
	Annual Arithmetic Mean (µg/m^3)	61.6	44.5	54.4	52.5	54.0
Fine Particulate Matter ($PM_{2.5}$)	Max 24-hour Concentration (µg/m^3)	90.6	53.1	46.1	60.8	41.9
	Days > NAAQS (35 µg/m^3)	*	1.1	5.4	2.1	5.1
	Annual Arithmetic Mean (µg/m^3)	*	10.7	12.0	10.3	11.0
El Centro – 9th Street Station						
Ozone	Max 1-hour Concentration (ppm)	0.102	0.080	0.097	0.096	0.113
	Days > CAAQS (0.09 ppm)	2	0	1	1	2
	Max 8-hour Concentration (ppm)	0.090	0.071	0.077	0.084	0.079
	Days > CAAQS (0.070 ppm)	15	1	2	7	10
	Days > NAAQS (0.070 ppm)	14	1	2	6	10
Coarse Particulate Matter (PM_{10})	Max 24-hour Concentration (µg/m^3)	256.3	130.0	197.7	194.5	554.6
	Days > CAAQS (50 µg/m^3)	113	53.7	92.0	88.6	99.3
	Days > NAAQS (150 µg/m^3)	5.1	0.0	2.0	1.0	2.1
	Annual Arithmetic Mean (µg/m^3)	47.3	35.6	41.5	41.8	45.5
Fine Particulate Matter ($PM_{2.5}$)	Max 24-hour Concentration (µg/m^3)	22.4	21.4	28.5	19.1	30.3
	Days > NAAQS (35 µg/m^3)	0.0	0.0	0.0	0.0	0.0
	Annual Arithmetic Mean (µg/m^3)	8.7	7.9	9.8	8.4	8.9

Notes: CAAQS = California ambient air quality standards; µg/m^3 = micrograms per cubic meter; NAAQS = National ambient air quality standards; ppm = parts per million; * = insufficient data available to determine the value. State statistics are based on California-approved samplers, whereas national statistics are based on samplers using federal reference or equivalent methods. State and national statistics may therefore be based on different samplers. When the measured state and national concentrations varied due to different sample methods, the highest concentration was reported in the summary table.
Source: California Air Resources Board (CARB) 2024.

Localized air pollutants generally dissipate with distance from the emission source and can pose a health risk to nearby populations. Toxic air contaminants (TACs), such as diesel particulate matter (DPM), are considered localized pollutants. CO is also considered a localized air pollutant. Air dispersion models can be used to reliably quantify the health risks to nearby receptors associated with emissions of localized air pollutants from an individual project. The primary air pollutants of concern in Imperial County and their associated health risks are discussed further below.

2.2.1 Ozone

While ozone serves a beneficial purpose in the upper atmosphere (stratosphere) by reducing ultraviolet radiation, it can be harmful to the human respiratory system and to sensitive species of plants when it reaches elevated concentrations in the lower atmosphere. Ozone is not emitted directly into the environment but is formed in the atmosphere by chemical reactions between ROG and NOx in the presence of sunlight. Ozone formation is greatest during periods of little or no wind, bright sunshine, and high temperatures. As a result, levels of ozone usually build up during the day and peak in the afternoon.

Sources of ROG and NOx are vehicle tailpipe emissions; evaporation of solvents, paints, and fuels; and biogenic emissions. Short-term ozone exposure can reduce lung function in children, facilitate respiratory infections, and produce symptoms of respiratory distress. Long-term exposure can impair lung defense mechanisms and lead to emphysema and chronic bronchitis. Ozone can also damage plants and trees and materials such as rubber and fabrics.

2.2.2 Particulate Matter

PM_{10} and $PM_{2.5}$ consist of extremely small, suspended particles or droplets that are 10 microns and 2.5 microns or smaller in diameter, respectively. Some sources of particulate, such as pollen, forest fires, and windblown dust matter, are naturally occurring. In populated areas, however, most particulate matter is caused by road dust, combustion by-products, abrasion of tires and brakes, and construction activities. Particulate matter can also be formed in the atmosphere by condensation of SO_2 and ROG.

Exposure to particulate matter can affect breathing, aggravate existing respiratory and cardiovascular disease, alter the body's defense systems against foreign materials, and damage lung tissue, contributing to cancer and premature death. Individuals with chronic obstructive pulmonary or cardiovascular disease, asthmatics, the elderly, and children are most sensitive to the effects of particulate matter.

2.2.3 Carbon Monoxide (CO)

CO is an odorless and colorless gas formed by the incomplete combustion of fuels. When inhaled at high concentrations, CO combines with hemoglobin in the blood and reduces the oxygen-carrying capacity of the blood. This results in reduced oxygen reaching the brain, heart, and other body tissues. This condition is especially critical for people with cardiovascular diseases, chronic lung disease or anemia, as well as fetuses. Even healthy people exposed to high CO concentrations can experience headaches, dizziness, fatigue, unconsciousness, and even death.

2.2.4 Toxic Air Contaminants (TACs)

TACs include a diverse group of air pollutants that can adversely affect human health. Unlike criteria air pollutants, which generally affect regional air quality, TAC emissions are evaluated based on estimations of localized concentrations and risk assessments. The adverse health effects a person may experience following exposure to any chemical depend on several factors, including the amount (dose), duration, chemical form, and any simultaneous exposure to other chemicals.

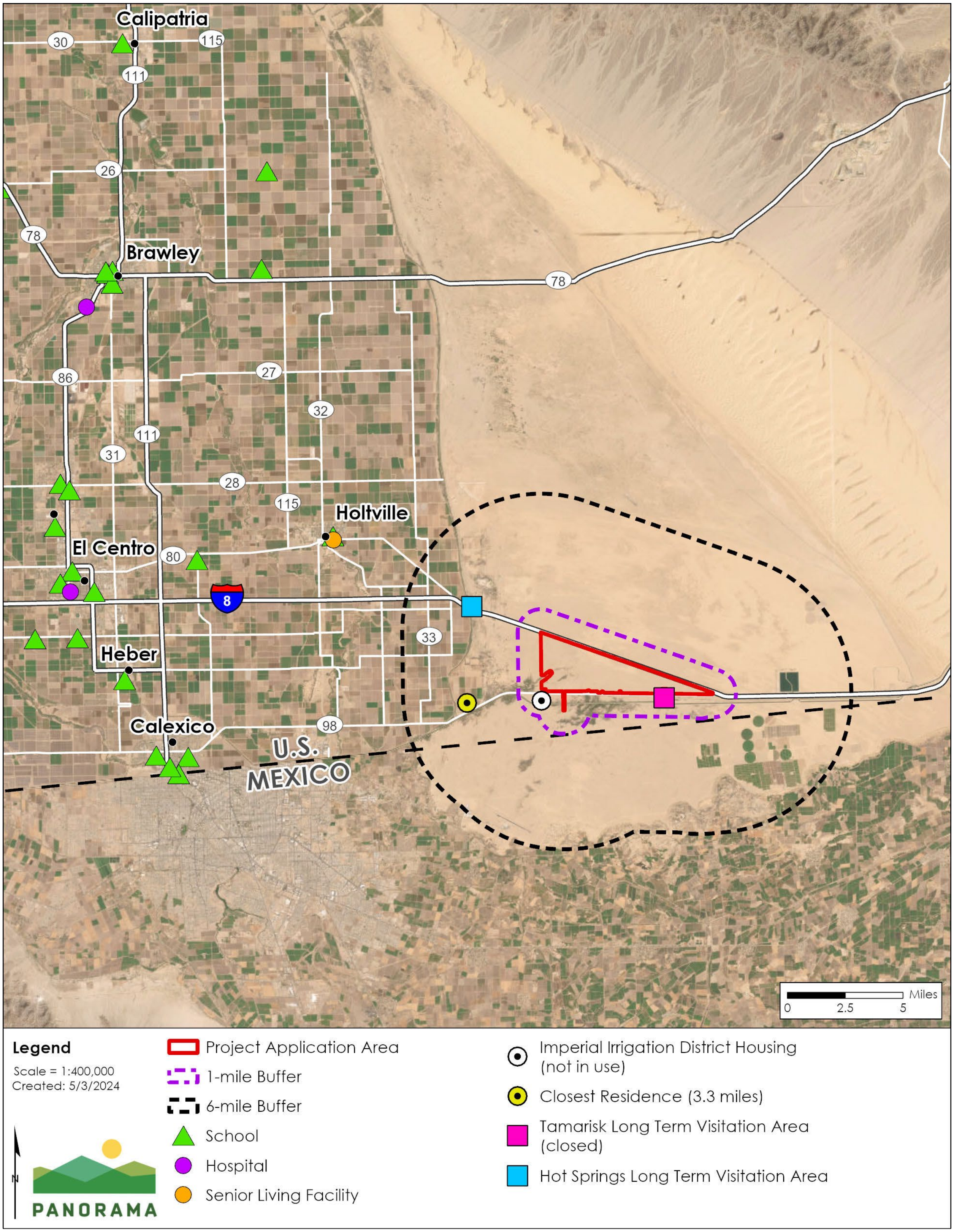
For risk assessment purposes, TACs are separated into carcinogens and non-carcinogens. Carcinogens are assumed to have no safe threshold below which health impacts would not occur, and cancer risk is expressed as excess cancer cases per 1 million exposed individuals over a lifetime of exposure. Non-carcinogenic substances are generally assumed to have a safe threshold below which health impacts would not occur. Acute and chronic exposure to non-carcinogens is expressed as a hazard index, which is the sum of expected exposure levels divided by the corresponding acceptable exposure levels.

Emissions of DPM generated from the exhaust of diesel-powered engines are a complex mixture of soot, ash particulates, metallic abrasion particles, volatile organic compounds, and other components that can penetrate deeply into the lungs and contribute to a range of health problems. In 1998, CARB identified DPM from diesel-powered engines as a TAC based on its potential to cause cancer and other adverse health effects (CARB, 1998). While diesel exhaust is a complex mixture that includes hundreds of individual constituents, DPM is used as a surrogate measure of exposure, under California regulatory guidelines, for the mixture of chemicals that make up diesel exhaust as a whole. More than 90 percent of DPM is less than 1 micron in diameter and is thus a subset of PM_{10} (CARB, 2016). The estimated cancer risk from exposure to diesel exhaust is much higher than the risk associated with any other TAC routinely measured in the region.

2.3 Sensitive Receptors

Sensitive receptor locations are areas where individuals are more susceptible to the adverse effects of poor air quality. Sensitive receptor locations include, but are not limited to, hospitals, schools, daycare facilities, elderly housing, and convalescent facilities. Residential areas are also considered sensitive receptors because people are often at home for extended periods, thereby increasing the duration of exposure to potential air contaminants. The Project site is located in a relatively remote region of Imperial County. There nearest sensitive receptor is a residence 3.3 miles west of the Project Application Area (**Figure 4**).

Figure 4. Sensitive Receptor Locations



2.4 Climate Change and GHG Emissions

Climate change refers to change in the Earth's weather patterns, including the rise in average global temperature due to an increase in heat-trapping GHGs in the atmosphere. Existing GHGs allow about two-thirds of the visible and ultraviolet light from the sun to pass through the atmosphere and be absorbed by the Earth's surface. To balance the absorbed incoming energy, the surface radiates thermal energy back to space at longer wavelengths primarily in the infrared part of the spectrum. Much of the thermal radiation emitted from the surface is absorbed by the GHGs in the atmosphere and is re-radiated in all directions. Since part of the re-radiation is back toward the surface and the lower atmosphere, the global surface temperatures are elevated above what they would be in the absence of GHGs. This process of trapping heat in the lower atmosphere is known as the greenhouse effect.

An increase of GHGs in the atmosphere affects the energy balance of the Earth and results in a global warming trend. Increases in global average temperatures have been observed since the mid-20th century and have been linked to observed increases in GHG emissions from anthropogenic sources. The primary GHG emissions of concern are carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Other GHGs of concern include hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6), but their contribution to climate change is less than 1 percent of the total GHGs that are well-mixed (i.e., that have atmospheric lifetimes long enough to be homogeneously mixed in the troposphere) (IPCC, 2013). Each GHG has a different global warming potential. For instance, CH_4 traps about 28 times more heat per molecule than CO_2 (IPCC, 2014). As a result, emissions of GHGs are reported in metric tons of carbon dioxide equivalents (CO_2e), wherein each GHG is weighted by its global warming potential relative to CO_2.

Ice-core records of historical atmospheric CO_2 concentrations, which currently extend back about 800,000 years, indicate that CO_2 concentrations naturally fluctuate between glacial and interglacial periods. According to the Intergovernmental Panel on Climate Change (IPCC), over the past few hundred years the atmospheric concentrations of CO_2 have increased to unprecedented levels compared to previous fluctuations in CO_2 concentrations observed over the past 800,000 years due to anthropogenic sources. In 2011, concentrations of CO_2, CH_4, and N_2O exceeded the pre-industrial era (before 1750) by about 40, 150, and 20 percent, respectively (BAAQMD, 2015). Based on measurements of the Earth's global average surface temperature, eight of the top 10 warmest years on record since 1880 have occurred in the last decade (NASA, 2022).

The global increases in CO_2 concentration are due primarily to fossil fuel combustion and land use change (e.g., deforestation). The dominant anthropogenic sources of CH_4 are from ruminant livestock, fossil fuel extraction and use, rice paddy agriculture, and landfills, while the dominant anthropogenic sources of N_2O are from ammonia for fertilizer and industrial activity. Emissions of HFCs, PFCs, and SF_6 are not naturally occurring; they originate from industrial processes such as semiconductor manufacturing, their use as refrigerants and other products, and electric power transmission and distribution (BAAQMD, 2015).

2.5 Effects of GHG Emissions

Some of the potential effects of increased GHG emissions and associated climate change may include loss of snowpack (affecting water supply), more frequent extreme weather events, more large forest fires, more drought years, and sea level rise. In addition, climate change may increase electricity demand for cooling, decrease the availability of hydroelectric power, and affect regional air quality and public health (BAAQMD, 2017a).

In October 2018, the IPCC published a special report on potential long-term climate change impacts based on the projected increases in temperature due to global climate change. The IPCC report found that the Earth is already seeing the consequences of global warming due to a 1° Celsius increase in pre-industrial levels, such as extreme weather, rising sea levels, and diminishing Arctic Sea ice. Global warming is likely to reach 1.5° Celsius above pre-industrial levels between 2030 and 2050 if it continues to increase at the current rate. Some of the impacts due to ongoing global warming could be avoided by limiting future global warming to 1.5° Celsius compared to 2° Celsius. For example, by limiting global warming to 1.5° Celsius or lower, the likelihood of an Arctic Ocean free of sea ice in summer would be ten times lower compared to the likelihood under the scenario of a 2° Celsius increase. Beyond the 1.5° Celsius threshold, there would be significant increases in the risk associated with long-lasting or irreversible changes, such as the loss of ecosystems (IPCC, 2018).

The IPCC Sixth Assessment Report published in 2023 updates prior versions of the report and notes that global temperature increases have already caused extreme weather and climate across the globe, which has damaged nature and people. The report found that global GHG emissions make it likely that warming will exceed 1.5°Celsius during the 21st century and make it harder to limit warming below 2°Celsius. The report finds that some future changes are unavoidable and/or irreversible but can be limited by deep, rapid, and sustained global greenhouse gas emissions reduction. Limiting warming to 1.5°Celsius with no or limited overshoot, and those that limit warming to 2°Celsius, requires rapid and deep and, in most cases, immediate greenhouse gas emissions reductions in all sectors this decade (IPCC 2023).

3. REGULATORY FRAMEWORK

3.1 Federal and State Regulations

3.1.1 Federal and State Air Quality Regulations

The U.S. EPA is responsible for implementing the programs established under the Federal Clean Air Act, such as establishing and reviewing the National Ambient Air Quality Standards (NAAQS) and judging the adequacy of State Implementation Plans to attain the NAAQS. A State Implementation Plan must integrate federal, state, and local plan components and regulations to identify specific measures to reduce pollution in nonattainment areas, using a combination of performance standards and market-based programs. If a state fails to enforce its implementation of approved regulations, or if the U.S. EPA determines that a State Implementation Plan is inadequate, the U.S. EPA is required to prepare and enforce a Federal

Implementation Plan to promulgate comprehensive control measures for a given State Implementation Plan.

CARB is responsible for establishing and reviewing the California Ambient Air Quality Standards (CAAQS), developing and managing the California State Implementation Plans, identifying TACs, and overseeing the activities of regional air quality management districts. In California, mobile emissions sources (e.g., construction equipment, trucks, and automobiles) are regulated by CARB and stationary emissions sources (e.g., industrial facilities) are regulated by the regional air quality management districts.

The CAAQS and NAAQS, which were developed for criteria air pollutants, are intended to incorporate an adequate margin of safety to protect the public health and welfare. California also has ambient air quality standards for sulfates, visibility-reducing particles, hydrogen sulfide, and vinyl chloride. To achieve CAAQS, criteria air pollutant emissions are managed through control measures described in regional air quality plans as well as emission limitations placed on permitted stationary sources. The CAAQS and NAAQS are summarized in **Table 6**.

Table 6. Ambient Air Quality Standards

Pollutant	Averaging Time	CAAQS Concentration	NAAQS Concentration
Ozone	1-Hour	0.09 ppm	Revoked in 2005
	8-Hour	0.070 ppm	0.070 ppm
Coarse Particulate Matter (PM_{10})	24-Hour	50 µg/m^3	150 µg/m^3
	Annual	20 µg/m^3	---
Fine Particulate Matter ($PM_{2.5}$)	24-Hour	---	35 µg/m^3
	Annual	12 µg/m^3	12 µg/m^3
Nitrogen Dioxide (NO_2)	1-Hour	0.18 ppm	0.100 ppm
	Annual	0.030 ppm	0.053 ppm
Carbon Monoxide (CO)	1-Hour	20 ppm	35 ppm
	8-Hour	9.0 ppm	9 ppm
Sulfur Dioxide (SO_2)	1-Hour	0.25 ppm	0.075 ppm
	24-Hour	0.04 ppm	0.14 ppm
	Annual	---	0.030 ppm
Lead	30-Day	1.5 µg/m^3	---
	Calendar Quarter	---	1.5 µg/m^3
	Rolling 3-Month	---	0.15 µg/m^3
Sulfates	24-Hour	25 µg/m3	---
Hydrogen Sulfide	1-Hour	0.03 ppm	---
Vinyl Chloride	24-Hour	0.010 ppm	---
Visibility Reducing Particles	8-Hour	---	---

Notes: ppm = parts per million; µg/m^3 = micrograms per cubic meter.
Source: BAAQMD, 2017b.

In accordance with the Federal Clean Air Act and California Clean Air Act, areas in California are classified as either in attainment, maintenance (i.e., former nonattainment), or nonattainment of the NAAQS and CAAQS for each criteria air pollutant. As shown in **Table 7**, Imperial County (specifically the portion where the Project site is located) is designated as a nonattainment area for ozone and PM_{10} under the State standards, a marginal nonattainment area for ozone under the federal standards, and an attainment or unclassified area for all other ambient air quality standards.

Table 7. Attainment Status for Imperial County

Pollutant	State Designation	Federal Designation
Ozone	Nonattainment	Moderate-Nonattainment[1]
Coarse Particulate Matter (PM_{10})	Nonattainment	Maintenance / Attainment[2]
Fine Particulate Matter ($PM_{2.5}$)	Attainment[3]	Attainment[4]
Nitrogen Dioxide (NO_2)	Attainment	Unclassified / Attainment
Carbon Monoxide (CO)	Unclassified	Unclassified / Attainment
Sulfur Dioxide (SO_2)	Attainment	Unclassified / Attainment
Lead	Attainment	Unclassified / Attainment
Sulfates	Attainment	---
Hydrogen Sulfide	Unclassified	---
Vinyl Chloride	Unclassified	---
Visibility Reducing Particles	Unclassified	---

Notes:
[1] Imperial County is designated a marginal nonattainment area for the 2015 ozone standard and a moderate attainment area for the 2008 standard.
[2] Imperial County was previously designated a serious-nonattainment area for PM_{10}, but the U.S. EPA approved redesignation as an attainment area on September 18, 2020.
[3] The City of Calexico, which is within the Salton Sea Air Basin and shares a border with Imperial County, is designated a nonattainment area for $PM_{2.5}$, but Imperial County (which includes the Project site) is designated an attainment area.
[4] A portion of the Imperial Valley in south-central Imperial County is designated a moderate nonattainment area for $PM_{2.5}$, but the remainder of Imperial County (which includes the Project site) is designated an attainment area.
Sources: CARB, 2020; CARB, 2022a; U.S. EPA, 2023.

Regulation of TACs, referred to as hazardous air pollutants (HAPs) under federal regulations, is achieved through federal, state, and local controls on individual sources. The air toxics provisions of the Federal Clean Air Act require the U.S. EPA to identify HAPs that are known or suspected to cause cancer or other serious health effects to protect public health and welfare, and to establish National Emission Standards for Hazardous Air Pollutants. California regulates TACs primarily through the Tanner Air Toxics Act (Assembly Bill [AB] 1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588). The Tanner Act created California's program to identify and reduce exposure to TACs. To date, CARB has identified over 21 TACs and adopted the EPA's list of 189 HAPs as TACs. The Hot Spots Act supplements the Tanner Act by requiring a statewide air toxics inventory, notification of people exposed to a significant health risk, and facility plans to reduce these risks.

3.1.2 Federal Climate Action Goals

The U.S. participates in the United Nations Framework Convention on Climate Change. In 1998, the U.S. signed the Kyoto Protocol, which would have required reductions in GHGs; however, the protocol did not become binding in the U.S. as it was never ratified by Congress. Instead, the federal government chose voluntary and incentive-based programs to reduce emissions and has established programs to promote climate technology and science. In 2002, the U.S. announced a strategy to reduce the GHG intensity of the American economy by 18 percent over a 10-year period from 2002 to 2012. In 2015, the U.S. submitted its "intended nationally determined contribution" to the framework convention, which targets to cut net GHG emissions by 26 to 28 percent below 2005 levels by 2025. In 2015, the U.S. signed the Paris Agreement on climate change. The goal of the Paris Agreement is to hold the increase in global temperatures to below the 2°Celsius above pre-industrial levels. On January 27, 2021, the President issued Executive Order (EO) 14008: Tackling the Climate Crisis at Home and Abroad. EO 14008 set a federal clean electricity and vehicle procurement strategy that includes achieving a carbon free electricity sector by 2035.

The U.S. EPA is responsible for enforcing the Federal Clean Air Act and the 1990 amendments to it. On April 2, 2007, the U.S. Supreme Court ruled that CO_2 is an air pollutant as defined under the Clean Air Act, and that the EPA has the authority to regulate emissions of GHGs (U.S. Supreme Court, 2007). The EPA made two distinct findings regarding GHGs under Section 202(a) of the Clean Air Act, as follows:

- Endangerment Finding: The current and projected concentrations of the six key well-mixed GHGs (CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6) in the atmosphere threaten the public health and welfare of current and future generations.

- Cause or Contribute Finding: The combined emissions of these well-mixed GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution that threatens public health and welfare.

These findings do not themselves impose any requirements on industry or other entities. However, they were a prerequisite for implementing GHG emissions standards for vehicles.

3.1.3 Federal Vehicle Emission Regulations

The U.S. EPA has established national GHG emission and fuel economy regulations for vehicles that would achieve substantial GHG emissions reductions along with reductions in other criteria pollutants. Some of the key U.S. EPA regulations related to GHG emissions from vehicles are as follows:

- In 2010, the U.S. EPA in collaboration with the National Highway Traffic Safety Administration (NHTSA) finalized updated Corporate Average Fuel Economy (CAFE) and GHG emissions standards for passenger cars and light trucks light-duty vehicles for model years 2012 to 2016.

- In 2012, the U.S. EPA and NHTSA extended the CAFE and GHG emissions standards for light-duty vehicles for model years 2017 to 2025. Combined with the 2012 to 2016 standards, the regulation will result in vehicles emitting 50 percent less than 2010 levels in 2025.

- In 2016, the U.S. EPA and NHTSA finalized national GHG emission and fuel economy standards for medium- and heavy-duty vehicles that would cover model years 2018 to 2027 for certain trailers and model years 2021 to 2027 for semi-trucks, large pickup trucks, vans, and all types and sizes of buses and work trucks.

- In 2020, the U.S. EPA and NHTSA finalized updated CAFE and GHG emissions standards for passenger cars and light trucks and established new standards, covering model years 2021 through 2026.

- In 2021, the U.S. EPA revised the GHG emissions standards for passenger cars and light trucks for model years 2023 through 2026 to leverage advances in clean car technology.

In 2022, the NHSTA revised the CAFE standards for passenger cars and light trucks for model years 2024 to 2026. These standards are expected to result in average fuel economy label values of 49 miles per gallon.

3.1.4 California Climate Action Goals

The State of California has established the following long-term climate action goals:

- **Assembly Bill (AB) 1279:** Codifies the economy-wide 2045 carbon neutrality goal and requires that at least 85% of the reductions come from emission reductions..

3.1.5 California Clean Electricity Goals

The State of California has established the following clean electricity requirements:

- Senate Bill (SB) 100: Requires renewable energy and zero-carbon resources supply 100 percent of electric retail sales to end-use customers by 2045.
- SB 1020: Revised zero-carbon energy goals originally set in SB 100, with more aggressive targets: 90% by 2035; 95% by 2040; 100% by 2045.

3.1.6 California Vehicle Emission Regulations

The State of California has established statewide GHG emission and fuel economy regulations for vehicles that align with or supersede the national standards. The key state regulations related to GHG emissions from vehicles are as follows:

- The Pavley Regulations (AB 1493), as amended in 2009, required a 30 percent reduction in state GHG emissions from new passenger vehicles from 2009 through 2016.

- The Advanced Clean Cars Program extends the Pavley Regulations beyond 2016 and established a technology mandate for zero-emission vehicles.

- The Advanced Clean Cars II Program requires all new passenger cars, trucks, and sport utility vehicles sold in California to be zero-emission vehicles by 2035.

- The Low-Carbon Fuel Standard (Executive Order S-1-07), as amended in 2019, requires a 20 percent reduction in the carbon intensity of California's transportation fuels by 2030.

SB 375 establishes regional GHG reduction targets from passenger vehicles for the years 2020 and 2035 by requiring metropolitan planning organizations to develop and implement Sustainable Communities Strategies that align regional transportation planning efforts with regional housing allocation needs.

3.1.7 California Energy Efficiency Regulations

The State of California has established statewide energy efficiency regulations:

- Title 24 Building Efficiency Standards are updated every three years with the long-term vision to support zero-net energy for all new single-family and low-rise residential buildings by 2020 and new high-rise residential and nonresidential buildings by 2030.

Title 24 California Green Building Standards, referred to as the CALGreen Code, aim to improve public health, safety, and general welfare by enhancing the design and construction of buildings through the use of building concepts having a positive environmental impact and encouraging sustainable construction practices in the following categories: (1) planning and design, (2) energy efficiency, (3) water efficiency and conservation, (4) material conservation and resource efficiency, and (5) environmental air quality.

3.1.8 California Cap-and-Trade Program

The Cap-and-Trade Program is a key element of California's strategy to reduce GHG emissions from covered entities[1] that are responsible for about 85 percent of California's GHG emissions. The program establishes a declining limit on major sources of GHG emissions throughout California, and it creates a powerful economic incentive for significant investment in cleaner and more efficient technologies. CARB creates allowances equal to the total amount of permissible GHG emissions (i.e., the "cap"). Each year, fewer allowances are created and the annual cap declines. As a result, the annual auction reserve price for allowances increases, which creates a steady and sustained carbon price signal to incentivize actions to reduce GHG emissions and enable a smooth transition to a cleaner economy.

3.1.9 California's Short-Lived Climate Pollutant Reduction Strategy

The Short-Lived Climate Pollutant (SLCP) Reduction Strategy is California's plan for reducing emissions of high global-warming potential gases with short atmospheric lifetimes (CARB, 2017a). SLCPs include methane, HFCs, and anthropogenic black carbon. In accordance with SB 1383, the SLCP Reduction Strategy has set the following targets for statewide reductions in SLCP emissions:

[1] The program's covered entities include electric power plants, fuel distributors (natural gas and petroleum), and large industrial facilities that emit more than 25,000 million metric tons of CO_2e per year.

- 40 percent below 2013 levels by 2030 for methane and HFCs.
- 50 percent below 2013 levels by 2030 for anthropogenic black carbon.

The SLCP Reduction Strategy also provides specific direction for reductions from dairy and livestock operations and from landfills by diverting organic materials.

3.1.10 California's Climate Change Scoping Plan

In December 2008, CARB adopted the Climate Change Scoping Plan to identify how the state can achieve its 2020 climate action goal under AB 32. In 2017, CARB updated the Scoping Plan to identify how the state can achieve its 2030 climate action goal under SB 32, and substantially advance toward its 2050 climate action goal under Executive Order S-3-05. The 2017 Scoping Plan includes the regulatory programs identified above, such as the Advanced Clean Cars Program, Low-Carbon Fuel Standard, Renewable Portfolio Standard Program, energy efficiency standards, SLCP Reduction Strategy, and Cap-and-Trade Program (CARB, 2017b).

In December 2022, CARB adopted the 2022 Scoping Plan for Achieving Carbon Neutrality (2022 Scoping Plan), which outlines a roadmap to achieve targets for carbon neutrality and reduce anthropogenic GHG emissions by 85 percent below 1990 levels no later than 2045 (CARB, 2022b). Building on the 2017 Scoping Plan, the 2022 Scoping Plan evaluates the progress made toward meeting the 2030 GHG reduction target established in SB 32 and identifies a technologically feasible, cost-effective, and equity-focused path to achieve carbon neutrality by 2045. The 2022 Scoping Plan presents an approach for an aggressive reduction of fossil fuels and a rapid transition to renewable energy resources and zero-emission vehicles. The 2022 Scoping Plan identifies actions and outcomes such as rapidly moving to zero-emission transportation; electrifying cars, buses, trains, and trucks; phasing out the use of fossil gas used for heating homes and buildings; clamping down on chemicals and refrigerants; providing communities with sustainable options for walking, biking, and public transit; building out clean, renewable energy resources (such as solar arrays and wind turbine capacity) to displace fossil-fuel fired electrical generation; and scaling up new options such as renewable hydrogen and biomethane. Appendix D of the 2022 Scoping Plan includes recommendations for local government to take actions that align with the state's climate goals, with a focus on local climate action plans and local authority over new residential and mixed-use development. Appendix D of the 2022 Scoping Plan recommends for local jurisdictions to focus on three priority areas when preparing a climate action plan: transportation electrification, vehicle miles travelled reduction, and building decarbonization.

3.1.11 California's Sulfur Hexafluoride Regulation

High-voltage equipment that transmits and distributes electricity has typically used SF_6 as an electrical insulator. Fugitive emissions of SF_6 can escape from gas insulated substations and switchgear through seals and can also be released during equipment installation and when equipment is opened for servicing.

As required by AB 32, CARB approved the reduction of SF_6 emissions from electricity transmission and distribution equipment as an early action measure in 2007. In 2010, CARB adopted the Regulation for Reducing Sulfur Hexafluoride Emissions from Gas Insulated Switchgear, which requires switchgear owners to reduce their SF_6 emission rates to 1 percent by 2020. CARB amended the regulation in 2021 to phase out the acquisition of SF_6 gas-insulated equipment. Other changes are also adopted to cover other GHGs beyond SF_6 and enhance accuracy of emissions accounting and reporting. The amended regulation became effective January 1, 2022.

3.2 Regional Regulations

3.2.1 ICAPCD Rules and Responsibilities

ICAPCD is primarily responsible for ensuring that the NAAQS and CAAQS are attained and maintained in the SSAB. ICAPCD fulfills this responsibility by adopting and enforcing rules and regulations concerning air pollutant sources, issuing permits, inspecting stationary sources of air pollutants, responding to citizen complaints, and monitoring ambient air quality and meteorological conditions. **Table 8** summarizes the ICAPCD's rules and regulations relevant to controlling emissions from the Project.

Table 8. ICAPCD Rules and Regulations

Pollutant	Description
Rule 207 - New and Modified Stationary Source Review	Establishes preconstruction review requirements for new and modified stationary sources (e.g., standby generators) to ensure the operations of equipment does not interfere with attainment or maintenance of ambient air quality standards.
Rule 208 – Permit to Operate	Allows the ICAPCD to inspect and evaluate a permitted facility to ensure the facility will operate to comply with the provisions of the Authority to Construct permit (see Rule 207) and comply with all applicable laws, rules, standards, and guidelines.
Regulation VIII – Fugitive Dust Rules (Rules 800 to 806)	Sets forth rules regarding the control of fugitive dust, including fugitive dust from construction activities. The regulation requires implementation of fugitive dust control measures to reduce emissions from earthmoving, unpaved roads, handling of bulk materials, and control of track-out/carry-out dust from active construction sites. For construction of non-residential developments greater than 5 acres, a dust control plan must be prepared and implemented, and the ICAPCD must be notified 10 days prior to the commencement of any construction activities. The dust control plan must identify Best Available Control Measures to reduce fugitive dust during construction activities, which may include but are not limited to following: • Phase work to minimize the amount of disturbed surface area at any one time. • Apply water or chemical stabilizers to disturbed soils. • Construct and maintain wind barriers. • Cover bulk materials stored outdoors. • Use track-out control devices or wash down systems at access points to paved roads.

Source: ICAPCD, 2024a.

3.2.2 CEQA Air Quality Handbook

In 2017, ICAPCD published the *CEQA Air Quality Handbook* that include guidelines and thresholds of significance to assist lead agencies in evaluating and mitigating air quality impacts under CEQA (ICAPCD, 2017a). ICAPCD's thresholds establish levels at which emissions of criteria air pollutants and precursors, TACs, and odors could cause significant air quality impacts.

3.2.3 Air Quality Plans

In accordance with the California Clean Air Act, ICAPCD is required to prepare and update air quality plans that outline measures by which both stationary and mobile sources of pollutants can be controlled to achieve the NAAQS and CAAQS in areas designated as nonattainment.

- In 2017, ICAPCD adopted the *Imperial County Plan for the 2008 8-hour Ozone Standard* (2017 Ozone Plan), which includes the identification of control measures to reduce ozone precursors (ICAPCD, 2017b).

- In 2018, ICAPCD adopted the *Redesignation Request and Maintenance Plan for Particulate Matter Less than 10 microns in Diameter* (2018 PM_{10} Plan), which shows that Imperial County has attained and will maintain the 24-hour PM_{10} standard out to 2030 and addresses all requirements under the Federal Clean Air Act (ICAPCD, 2018a). On September 18, 2020, the U.S. EPA approved the 2018 PM_{10} Plan, including the State's request to redesignate Imperial County from nonattainment to attainment for the federal PM_{10} air quality standard (U.S. EPA, 2020).

- In 2014, ICAPCD adopted the *Imperial County 2013 State Implementation Plan for the 2006 24-Hour* $PM_{2.5}$ *Moderate Nonattainment Area* (ICAPCD, 2014); however, this only applies to the non-attainment status in the south-central portion of Imperial County which does not include the Project site.

- In 2018, ICAPCD adopted the Imperial County *2018 Annual Particulate Matter Less than 2.5 Microns in Diameter State Implementation Plan* (ICAPCD, 2018b); however, this only applies to the non-attainment status in the south-central portion of Imperial County which does not include the Project site.

3.2.4 Imperial County General Plan

The Conservation and Open Space Element of the Imperial County General Plan (Imperial County Planning and Development Services Department, 2016) includes the following policy and program related to air quality and GHG emissions that would be applicable to the Project:

> **Policy:** Reduce PM_{10} and $PM_{2.5}$ emissions from unpaved roads, agricultural fields, and exposed Salton Sea lakebed.
>
> **Program:** Implement all ICAPCD particulate matter (PM) emission controls including the Final PM10 2009 State Implementation Plan and the 2013 State Implementation Plan for the 2006 24-Hour PM2.5 Moderate Nonattainment Area.

3.2.5 Desert Renewable Energy Conservation Plan

The entirety of the Project Application Area within BLM-administered public land is designated a Development Focus Area under the Desert Renewable Energy Conservation Plan (DRECP) and its associated Record of Decision (BLM, 2016a). The DRECP was developed to advance federal and state natural resource conservation goals and other state laws while facilitating a timely and streamlined permit process for renewable energy projects (BLM, 2015). A Development Focus Area is considered an area suitable for renewable energy development under the DRECP.

Conservation and Management Actions (CMAs) are required mitigation measures for Development Focus Areas in California. These were identified in the 2016 DRECP Land Use Plan Amendment (LUPA) (BLM, 2016b), which are applicable for some BLM-administered lands in southern California. The CMAs were designed to achieve the goals and objectives for activities within the LUPA's various land use allocations. These measures identify a specific set of avoidance, minimization, and compensation measures, and allowable and non-allowable actions for siting, design, pre-construction, construction, maintenance, implementation, operation, and decommissioning activities on BLM-managed lands. The intent of these is to provide certainty on what avoidance and minimization measures, design features, and compensation/mitigation measures would be required for a particular action within any one of the LUPA's land use allocation types. Some CMAs apply planning-area wide, whereas others apply only within specific land use allocations.

3.3 Project Best Management Practices and Design Features

In December 2023, the Applicant adopted the *Preliminary Best Management Practices and Project Design Features for the Project* (IP Perkins, LLC, 2023a), which identifies preliminary best management practices (BMPs) and Project design features associated with the siting and design, construction, operation and maintenance, and decommissioning of the Project: these are subject to change as the Project proceeds through the permitting process. BMPs are state-of-the-art measures applied on a site-specific basis to avoid, minimize, reduce, rectify, or compensate for adverse environmental or social impacts. They are selectively applied to aid in achieving desired outcomes for safe, environmentally responsible development, by preventing, minimizing, or mitigating adverse impacts and reducing conflicts. Design features are requirements that must be incorporated into Project-specific plans and implemented by the contractor team. In general, the design features are accepted practices that are known to be effective when implemented properly.

Table 9 summarized the BMPs related to air quality that would be incorporated into the Project. Implementation of BMPs would comply with the CMAs identified in the 2016 DRECP LUPA.

Table 9. Best Management Practices for Air Quality

No.	Topic	Description of Measures	Phase
1	Emissions	Vehicle use shall be reduced to the extent feasible. Carpooling will be used to reduce the amount of daily vehicle trips to the project site. The project will comply with LUPA-AIR-3.	C, O, D
2	Emissions	Idling of diesel equipment shall be limited to no more than 5 minutes unless idling must be maintained for proper operation (e.g., drilling, hoisting, and trenching). The project will comply with LUPA-AIR-3.	C, O, D
3	Emissions	Consider using electric vehicles, biodiesel, or alternative fuels where feasible during construction and operation phases to reduce the project's criteria and GHG pollutant emissions. The project will comply with LUPA-AIR-3.	C, O, D
4	Fugitive Dust	Workers shall be trained to comply with the speed limit, use good engineering practices, minimize drop height of materials, and minimize disturbed areas. The project will comply with LUPA-AIR-5.	C, O, D
5	Fugitive Dust	Construction shall be staged to limit the amount of exposed area at any time, whenever practical. The project will comply with LUPA-AIR-5.	C, O, D
6	Fugitive Dust	Access to the construction site and staging areas shall be limited to authorized vehicles only on the designated treated roads. The project will comply with LUPA-AIR-5.	C, O, D
7	Fugitive Dust	Access roads, on-site roads, and parking lots shall be surfaced with aggregate with hardness sufficient to prevent vehicles from crushing the aggregate and thus causing dust or compacted soil conditions. Paving could also be used on access roads and parking lots. Alternatively, agency-approved chemical dust suppressants (calcium chloride, FSB-100, Plas-Tex, Soil Sement, SRB-1000, etc.) or durable polymeric soil stabilizers shall be used on these locations (e.g., Gorilla-Snot, Soiltac, or Earthguard pellets). The project will comply with LUPA-AIR-5.	C, O, D
8	Fugitive Dust	All unpaved roads, disturbed areas (e.g., areas of scraping, excavation, backfilling, grading, and compacting), and loose materials generated during project activities shall be watered as frequently as necessary to minimize fugitive dust generation. In water-deprived locations, water spraying shall be limited to active disturbance areas only and non-water-based dust control measures shall be implemented in areas with intermittent or non-heavy use, such as stockpiles or access roads. The project will comply with LUPA-AIR-5.	C, O, D
9	Fugitive Dust	Speed limits (e.g., 15 mph) within the construction site shall be posted with visible signs and enforced to minimize airborne fugitive dust. The project will comply with LUPA-AIR-5.	C, D
10	Fugitive Dust	All vehicles transporting loose materials traveling on public roads shall be covered, and loads shall be sufficiently wet and kept below the freeboard of the truck. The project will comply with LUPA-AIR-5.	C, O, D
11	Fugitive Dust	Tires of all construction-related vehicles shall be inspected and cleaned as necessary to be free of dirt prior to entering paved public roadways. The project will comply with LUPA-AIR-5.	C, D
12	Fugitive Dust	Visible track-out or runoff dirt on public roadways from the construction site shall be cleaned (e.g., through street vacuum sweeping). The project will comply with LUPA-AIR-5.	C, D
13	Fugitive Dust	Use wind erosion control techniques (such as windbreaks, water, chemical dust suppressants, and/or vegetation) where soils are disturbed in construction, access and maintenance routes, and materials stockpile areas. Keep related windbreaks in place until the soil is stabilized or permanently covered with vegetation. The project will comply with LUPA-AIR-5.	C, O, D

No.	Topic	Description of Measures	Phase
14	Fugitive Dust	All soil disturbance activities and travel on unpaved roads shall be minimized. The project will comply with LUPA-AIR-5.	C, O, D
15	Fugitive Dust	Any stockpiles shall be sprayed with water, covered with tarpaulins, and/or treated with appropriate dust suppressants, especially in preparation for high wind or storm conditions. Chemical dust suppressants that emit volatile organic compounds (VOCs) shall be avoided within or near zone nonattainment areas. The project will comply with LUPA-AIR-5.	C
16	Fugitive Dust	Potential environmental impacts from the use of dust palliatives shall be minimized by taking all necessary measures to keep the chemicals out of sensitive soil and streams. In addition, the application of dust palliatives shall comply with federal, state, and local laws and regulations. The project will comply with LUPA-AIR-5.	C, O, D

Notes: C = Construction, O = Operations, D = Decommissioning

The Project Design Features that would be incorporated into the Project are summarized in **Table 10**. It should be noted that the design feature PDF AQ-1, *Fugitive Dust Control Plan*, has already been prepared in accordance with the ICAPCD Regulation VIII fugitive dust rules (IP Perkins, LLC, 2023b).

Table 10. Project Design Features for Air Quality

No.	Description of Measures	Phase
PDF AQ-1	**Fugitive Dust Control Plan.** The project owner or owner's contractor shall prepare and implement a Fugitive Dust Control Plan to reduce fugitive dust emissions during project construction. The project owner shall maintain and implement equivalent fugitive dust control strategies during operation, maintenance, and decommissioning. The plan would apply to activities including, but not limited to, development of laydown and staging areas, site grading, vegetation management, and installing all project facilities through post-construction cleanup. The project owner or owner's contractor shall take every reasonable precaution to prevent all airborne fugitive dust plumes from leaving the project site and to prevent visible particulate matter from being deposited upon public roadways, as specified below. Where specified below, loose materials and soils shall be stabilized with a non-toxic soil stabilizer or soil weighting agent or watered two times daily or as frequently as necessary to minimize fugitive dust generation. Non-water-based soil stabilizers shall be as efficient as or more efficient for fugitive dust control than CARB-approved soil stabilizers and shall not increase any other environmental impacts, including loss of vegetation, adverse odors, or emissions of ozone precursor reactive organic gases (ROG) or volatile organic compounds (VOC). Prior to any earthmoving activity, the Fugitive Dust Control Plan shall be submitted to the CEC for review and approval to ensure compliance with the standards in ICAPCD Rule 801, Section F, Best Available Control Measures for Fugitive Dust, and recordkeeping requirements in ICAPCD Rule 801, Section G, Record of Control Implementation. Records shall be readily accessible for two years after the date of each entry and shall be provided to the lead agency and/or ICAPCD upon request.	C, O, D

No.	Description of Measures	Phase
	The following control measures would be included within the plan: • All disturbed areas, including bulk material storage which is not being actively utilized, shall be effectively stabilized and visible emissions shall be limited to no greater than 20 percent opacity for dust emissions by using water, chemical stabilizers, dust suppressants, tarps or other suitable material such as vegetative ground cover. • All on site unpaved roads will be effectively stabilized and visible emissions shall be limited to no greater than 20 percent opacity for dust emissions by paving, chemical stabilizers, dust suppressants and/or watering. • All unpaved traffic areas one (1) acre or more with 75 or more average vehicle trips per day will be effectively stabilized and visible emissions shall be limited to no greater than 20 percent opacity for dust emissions by paving, chemical stabilizers, dust suppressants and/or watering. • The transport of bulk materials shall be completely covered unless six inches of freeboard space from the top of the container is maintained with no spillage and loss of bulk material. In addition, the cargo compartment of all haul trucks is to be cleaned and/or washed at delivery site after removal of bulk material. • All track-out or carry-out will be cleaned at the end of each workday or immediately when mud or dirt extends a cumulative distance of 50 linear feet or more onto a paved road. • Movement of bulk material handling or transfer shall be stabilized prior to handling or at points of transfer with application of sufficient water, chemical stabilizers or by sheltering or enclosing the operation and transfer line. • Temporary unpaved roads shall be effectively stabilized, and visible emissions shall be limited to no greater than 20 percent opacity for dust emission by paving, chemical stabilizers, dust suppressants and/or watering. • All unpaved roads, disturbed areas (e.g., areas of scraping, excavation, backfilling, grading, and compacting), and loose materials generated during project activities shall be watered as frequently as necessary to minimize fugitive dust generation. In water-deprived locations, water spraying shall be limited to active disturbance areas only and non-water-based dust control measures shall be implemented in areas with intermittent or non-heavy use, such as stockpiles or access roads. • Replace or revegetate ground cover in disturbed areas as quickly as possible. • Install automatic sprinkler systems on soil piles, if visible dust emissions are observed. • Vehicle speed for all construction vehicles shall not exceed 15 mph on any unpaved surface at the construction site. • Vehicle travel shall be minimized through a trip reduction plan to achieve a target of 2 occupants per vehicle for construction employees. • Implement a shuttle service to and from retail services and food establishments during lunch hours. • Construction operations shall cease when wind speeds (not gusts) exceed 25 mph until the wind speeds reduce for one hour below 25 mph.	
PDF AQ-2	**Control On-Site Off-Road Equipment Emissions.** The Project owner, its contractor, and its subcontractors, when entering into construction contracts or when procuring off-road equipment or vehicles for on-site construction or O&M activities, shall ensure that the following measures are included within contract or procurement specifications: • All construction diesel engines not registered under California Air Resources Board's Statewide Portable Equipment Registration Program, with a rating of 50 hp or higher shall meet the Tier 4 California Emission Standards for Off-Road Compression-Ignition Engines,	C, O, D

No.	Description of Measures	Phase
	as specified in California Code of Regulations, Title 13, section 2423(b)(1), unless a good faith effort demonstrates that such engine is not available for a particular item of equipment. In the event that a Tier 4 engine is not available for any off-road equipment larger than 50 hp, a Tier 3 engine shall be used or that equipment shall be equipped with retrofit controls to reduce exhaust emissions of nitrogen oxides (NOx) and diesel particulate matter (DPM) to no more than Tier 3 levels unless certified by the engine manufacturers that the use of such devices is not practical for specific engine types. • The contractor shall provide equipment logs demonstrating Tier level compliance for all off-road diesel equipment and registration of portable diesel equipment. • All diesel-fueled engines used in the construction of the facility shall have clearly visible tags showing that the engine meets the standards of this measure. Records of inspections of visible tags shall be maintained and readily accessible for two years after the date of each entry and shall be provided to the lead agency and/or ICAPCD upon request. • All equipment and trucks used in the construction or O&M of the facility shall be properly maintained and the engines tuned to the engine manufacturer's specifications. • All diesel heavy construction equipment shall not idle for more than five minutes. Vehicles that need to idle as part of their normal operation (such as concrete trucks) are exempted from this requirement. • Diesel and gasoline-fueled equipment shall be replaced with electrically driven equivalents, provided they are not run via a portable generator set, where practical.	
PDF AQ-3	**Dust Suppression.** The project applicant shall employ a method of dust suppression (such as water or chemical stabilization) approved by CEC, BLM, RWQCB, and ICAPCD. The project applicant shall apply chemical stabilization as directed by the product manufacturer to control dust between the panels, and other non-used areas (exceptions will be the paved entrance and parking area, and Fire Department access/emergency entry/exit points as approved by CEC in coordination with Imperial County Fire/Office of Emergency Services [OES] Department).	
PDF AQ-4	**Dust Suppression Management Plan.** Prior to any earthmoving activity, the applicant shall submit a construction dust control plan and obtain CEC and BLM concurrence.	

Notes: C = Construction, O = Operations, D = Decommissioning

4. SIGNIFICANCE CRITERIA

Based on Appendix G of the CEQA Guidelines, implementation of the Project would result in a significant air quality impact if it 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; or
4) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

Implementation of the proposed project would result in a significant GHG impact if it would:

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

The ICAPCD's recommended thresholds of significance for CEQA analysis establish levels at which emissions of air pollutants and precursors (ROG, NOx, PM_{10}, CO, SO_2, $PM_{2.5}$, and TACs) could cause significant air quality impacts (ICAPCD, 2017). The ICAPCD's thresholds of significance used in this analysis are summarized in **Table 11**. According to the ICAPCD, a project that exceeds these thresholds is required to implement all standard mitigation measures as well as all feasible discretionary mitigation measures listed in Sections 7.2 and 7.3 of the ICAPCD's *Air Quality Handbook*. The Imperial County has not established formal quantitative or qualitative GHG thresholds for CEQA analysis.

Table 11. CEQA Thresholds of Significance

Impact Analysis	Pollutant	Threshold of Significance
Construction	ROG	75 lbs/day
	NOx	100 lbs/day
	PM_{10}	150 lbs/day
	CO	550 lbs/day
Operation	ROG	137 lbs/day
	NOx	137 lbs/day
	PM10	150 lbs/day
	SOx [1]	150 lbs/day
	CO	550 lbs/day
	$PM_{2.5}$	550 lbs/day

Notes: lbs = pounds
[1] Emissions that lead to high concentrations of SO_2 generally also lead to the formation of other sulfur oxides (SOx). Therefore, emissions of SO_2 are used as an indicator for SOx in this analysis.
Source: ICAPCD, 2017a.

5. METHODOLOGY AND ASSUMPTIONS

The Project's potential environmental impacts related to air quality and GHGs are evaluated in accordance with the significance criteria as described above. The Project's emissions of criteria air pollutants and precursors and GHGs during construction and operation were estimated based on project-specific information provided by the Applicant.

During construction, sources of criteria air pollutant and GHG emissions include earth-moving activities, off-road construction equipment, on-road construction vehicles related to worker vehicles, vendor trucks, and haul trucks, helicopters, and water usage (GHG only). The Project's construction criteria air pollutant and GHG emissions from off-road construction equipment, on-road construction vehicles, and water usage (GHG only) were estimated using the California Emissions Estimator Model (CalEEMod) version 2022.1.1, as well as spreadsheets based on CalEEMod methodology. CalEEMod uses widely accepted models for emission estimates combined with appropriate default data for a variety of land-use projects that can be used if site-specific information is not available. Criteria air pollutant and GHG emissions from helicopter usage were estimated based on the *Guidance on the Determination of Helicopter Emissions* (FOCA, 2015). The primary input data used to estimate emissions associated with construction of the Project were provided by the Applicant and contain information on the anticipated construction schedule and duration; construction equipment inventory and usage for each phase of construction (including the type, quantity, and hours of operation); construction trip rates for each phase of construction; helicopter usage; and water usage. Project design features presented in **Table 10** were incorporated in the calculations. The modeling assumptions, input parameters, methodology, and model outputs are documented in **Appendix A** and **Appendix B**.

During operation, sources of criteria air pollutant and GHG emissions include operation and maintenance activities, on-road vehicles, an up to 300-kilowatt emergency propane generator,[2] and SF_6 leakage from gas-insulated equipment (GHG only). In addition, construction of the Project would result in the removal of existing vegetation, which provide carbon uptake and act as a CO_2 sink. The loss of natural carbon uptake due to land-use conversion were estimated for the Project. Criteria air pollutant and GHG emissions from all the sources described above, except for SF_6 leakage, were estimated using the methodology from CalEEMod version 2022.1.1. GHG emissions from SF_6 leakage were calculated based on the methodology documented in U.S. EPA 40 CFR 98, Subpart A.

After commencing operation, the Project would deliver 1,150 MW of clean, renewable solar energy to California ratepayers. The renewable electricity generated by the Project would displace electricity generated by fossil fuels for meeting energy demand. The avoided GHG emissions from conventional power plants were estimated based on Project electricity production and CO_2 emissions factors for conventional generation technologies for marginal generation obtained from the CEC's *Estimated Cost of New Utility-Scale Generation in California: 2018 Update* (CEC, 2019).

6. ENVIRONMENTAL IMPACT ANALYSIS

6.1 Consistency with Applicable Air Quality Plans

There are two air quality plans that would apply to the Project the 2017 Ozone Plan and the 2018 PM_{10} Plan. These plans outline measures by which both stationary, area, and mobile sources of pollutants can be controlled to achieve the NAAQS and CAAQS in areas designated as nonattainment or maintenance.

The 2017 Ozone Plan identifies control measures for stationary sources, area sources, and transportation to reduce emissions of ozone precursors. The ICAPCD has the primary

[2] To be conservative, emissions of criteria air pollutants and GHGs from the propane generator were modeled as a diesel generator operating for up to 50 hours per year. "IID has been able to meet the energy demand and avoid rotating power outages despite tight market conditions and harsh weather" (IID 2022). The modeled 50 hours of use is, therefore, a conservative estimate.

responsibility for regulating emissions from stationary sources as well as from some area sources found within the County. Operation and maintenance of the proposed 300-kilowatt emergency propane generator at the Project site will be required to comply with ICAPCD Rule 207 - *New and Modified Stationary Source Review* and Rule 208 - *Permit to Operate* to ensure the stationary source operations do not interfere with attainment or maintenance of ambient air quality standards. At the state level, CARB is responsible for regulating on-road motor vehicles, some off-road mobile sources, consumer products, as well as setting motor vehicle fuel specifications in California. The Project would provide a new source of renewable energy that will facilitate in California's transition from fossil fuel to clean electrical power for on-road motor vehicles. In addition, the Applicant has adopted BMP 3 and the Project would implement PDF AQ-2, which would involve use of zero emission vehicles where available and increased efficiency in all construction equipment to reduce ozone emissions. The Project would not introduce any major area sources for ozone emissions, such as consumer products, and the use of off-road equipment during construction would be temporary. Therefore, the Project would support and be consistent with the control measures identified in the 2017 Ozone Plan.

The 2018 PM_{10} Plan identifies control measures to ensure Imperial County continues to maintain the 24-hour PM_{10} standard out to 2030. The ICAPCD Regulation VIII fugitive dust rules form the core control measures for reducing PM_{10} emissions in the County. Implementation of Project design feature PDF AQ-1, *Fugitive Dust Control Plan*, would ensure that the Project would comply with the ICAPCD Regulation VIII fugitive dust rules. It should also be noted that implementation of Project design feature PDF AQ-1, *Fugitive Dust Control Plan*, would be consistent with the policy and program for reducing particulate matter emissions in the Conservation and Open Space Element of the Imperial County General Plan. In addition, the Applicant has adopted BMPs 4 through 16 to help reduce fugitive dust emissions during all phases of the Project. Therefore, the Project would be consistent with the control measures identified in the 2018 PM_{10} Plan.

Overall, the Project would not conflict with or obstruct implementation of the applicable air quality plans.

6.2 Criteria Air Pollutant Emissions

6.2.1 Construction

Construction of the Project is expected to commence in January 2026 and extend to December 2027 for a duration of 24 months. Project construction includes six phases with the potential to overlap: 1) site preparation; 2) installation of solar PV panel system; 3) installation of inverters, substation, and electrical collector system; 4) construction of 500 kV gen-tie and loop-in transmission lines; 5) BESS installation; and 6) construction of the BAAH switchyard.

Project construction activities would generate criteria air pollutant emissions and precursors that could potentially affect regional air quality. During construction, the primary pollutant emissions of concern would be ROG, NOx, CO, and PM_{10} from the exhaust of off-road construction equipment, helicopters, and on-road construction vehicles related to worker vehicles, vendor trucks, and haul trucks. In addition, grading activities during construction would generate fugitive dust emissions of PM_{10}. The calculations for all criteria air pollutant emissions during construction, including NOx, SO_2, CO, PM_{10}, and $PM_{2.5}$, are included in **Appendix A**.

To analyze daily construction emission rates for ROG, NOx, CO, and PM_{10}, the total emissions estimated during construction were averaged over the total working days (520 days) and compared to the ICAPCD's recommended thresholds of significance. Project design features PDF AQ-1 and PDF AQ-2 to control fugitive dust emissions and on-site off-road equipment emissions, respectively, were incorporated in the calculations. As shown in **Table 12**, the Project's average daily construction emissions of PM_{10} would exceed the ICAPCD's threshold of significance. It should be noted that an exceedance of the ICAPCD's threshold of significance is not expected to result in the region becoming a nonattainment area due to the short-term duration of construction activities. Furthermore, Project design feature PDF AQ-1 for the control of fugitive dust emissions (e.g., ceasing construction operation when wind speeds exceed 25 mph) is consistent with the standard and discretionary mitigation measures for fugitive PM_{10} emissions recommended by the ICAPCD's *CEQA Air Quality Handbook* and the ICAPCD Regulation VIII fugitive dust rules. Project design feature PDF AQ-2 for the control of on-site off-road equipment emissions is consistent with the standard and discretionary mitigation measures for NOx and PM_{10} emissions from construction combustion equipment recommended by the ICAPCD's *CEQA Air Quality Handbook*. In addition, the Applicant has adopted BMPs 1 through 3 (e.g., encouraging carpooling and use of electric vehicles) to reduce exhaust emissions and BMPs 4 through 16 (e.g., posting 15 mph speed limits) to reduce fugitive dust emissions during all phases of construction. Collectively, the ICAPCD considers implementation of these enhanced dust control measures adequate to reduce PM_{10} emissions to a level less than significant (ICAPCD, 2024b).

Table 12. Average Daily Construction Emissions for Criteria Air Pollutants (Pounds per Day)

Emission Scenario	ROG	NOx	CO	PM_{10}
Construction Emissions	11.8	93.3	290.7	**327.5**
ICAPCD Thresholds	75	100	550	150

Notes: **Bold and blue shaded** values indicate exceedance of the threshold of significance.
Source: **Appendix A** and **Appendix B.**

As shown in **Table 12**, the Project's average daily construction emissions of ROG, NOx, and CO would be below the ICAPCD's thresholds of significance. However, the estimated NOx emissions are relatively close to the threshold with emissions only about 7 percent below. There is the possibility that Project construction could be completed in a shorter period than anticipated by increasing the amount of off-road equipment used per day, which would result in an increase in the average daily emissions of NOx. According to the ICAPCD, this is a reasonable concern because it has occurred during the construction of other solar PV facilities in Imperial County. Therefore, to ensure that Project construction emissions of NOx do not exceed the threshold of significance due to an increase in the amount of off-road equipment used daily, Mitigation Measures AIR-1 would be implemented. Mitigation Measure AIR-1 requires tracking of emissions and payment into the ICAPCD in-lieu fee program if emissions of NOx exceed the ICAPCD threshold to ensure the impact is less than significant.

Mitigation Measure AIR-1: NOx Mitigation

Before starting onsite construction activities, the Project Applicant shall submit a Construction Emissions Monitoring Plan (Plan) describing how the Project sponsor will track the actual hours of equipment use for each piece of off-road equipment during each phase of construction. A summary report of the off-road equipment use shall periodically be submitted to the CEC for review and shared with the Imperial County Air Pollution Control District (ICAPCD) for review. The summary report shall include, but is not limited to, the equipment type, equipment manufacturer, engine certification (Tier rating), horsepower, fuel type, and actual hours of operation. The frequency of summary report submittals shall be identified in the Plan as determined by the CEC and the Applicant.

If the CEC determines that the Project's actual NOx emissions during construction exceed the recommended threshold of significance, then the Applicant shall be required to comply with ICAPCD Policy Number 5, "Off-site Mitigation/In-lieu Fee". Policy Number 5 requires the Applicant to prepare and implement the following measures, as approved by the CEC, to reduce construction emissions of NOx below the threshold of significance:

1) Propose an off-site mitigation project providing supporting documentation that the reductions are met, or

2) Pay an in-lieu mitigation fee in accordance with the ICAPCD's Off-Site Mitigation/In-Lieu Fee Policy.

Implementation of Mitigation Measure AIR-1 together with Project design features PDF AQ-1 and PDF AQ-2, would ensure that all criteria air pollutant emissions are reduced to a level of insignificance.

6.2.2 Operation

Project operation would generate criteria air pollutant emissions that could potentially affect regional air quality. The primary pollutant emissions of concern during Project operation would be ROG, NOx, CO, SO_2, PM_{10}, and $PM_{2.5}$ from operation and maintenance activities, on-road vehicles, and a 300-kilowatt emergency propane generator. Project operational emissions were estimated using CalEEMod 2022.1.1. The results for all criteria air pollutant emissions during operation, including NOx, SO_2, CO, PM_{10}, and $PM_{2.5}$, are included in **Appendix B**.

Project emissions were estimated for 2028, which is the earliest expected year of operation. Since statewide vehicle emission standards are required to improve over time in accordance with the Advanced Clean Cars II Program and associated vehicle emission regulations, estimating emissions for the earliest year of operation provides the maximum expected annual emissions. The estimated operational maximum daily emissions for the Project are presented in **Table 13**.

Table 13. Average Daily Operation Emissions for Criteria Air Pollutants (Pounds per day)

Emission Scenario	ROG	NOx	CO	SO_2	PM_{10}	$PM_{2.5}$
Mobile	0.43	2.86	21.00	0.07	65.20	7.41
Area	0.10	0.01	0.13	0.01	0.01	0.01
Stationary [1]	0.05	0.16	0.18	0.01	0.01	0.01
Total	0.58	3.03	21.31	0.08	65.22	7.43
ICAPCD Thresholds	137	137	550	150	150	550
Threshold Exceedance?	No	No	No	No	No	No

Notes:
[1] To be conservative, emissions of criteria air pollutants from the propane generator were modeled as a diesel generator.
Source: **Appendix A** and **Appendix B.**

As shown in **Table 13**, the increase in operational emissions from the Project would not exceed the ICAPCD recommended thresholds of significance for ROG, NOx, CO, SO_2, PM_{10}, and $PM_{2.5}$. In addition, operation and maintenance of the proposed emergency propane generator at the Project site will be required to comply with ICAPCD Rule 207 – *New and Modified Stationary Source Review* to ensure the stationary source operations do not interfere with attainment or maintenance of ambient air quality standards. Therefore, operation of the Project would not result in a cumulatively considerable net increase in criteria air pollutants for which the region is in nonattainment.

6.3 Local Community Risks and Hazards

6.3.1 Criteria Air Pollutants

The CEC's AFC guidance (20 CCR, Div. 2, Ch. 5 App. B) requires a screening level air quality modeling analysis of the direct criteria pollutant impacts of project construction and operation on local air quality. The nearest sensitive receptor that could be exposed to criteria air pollutants generated by the Project is a residence located approximately 3.3 miles to the west.

A screening level modeling analysis of criteria air pollutants generated during Project construction and operation was conducted using the U.S. EPA's AERSCREEN dispersion model. Construction emissions were modeled as an approximately 6,000-acre area source and included all offsite emissions to be conservative. Operation emissions were modeled as a volume source[3] located at the O&M yard/facility and also included all offsite emissions to be conservative. Because AERSCREEN applies a theoretical worst-case scenario for meteorological conditions (i.e., wind speed, wind direction, temperature, and atmospheric stability) to conservatively estimate pollutant concentrations, the use and analysis of local meteorological data was not required. A copy of the input parameters and modeling results are included in **Appendix C**. As shown in **Table 14**, the estimated concentrations of NOx, SO_2, CO, PM_{10}, and $PM_{2.5}$ at the nearest sensitive receptor during Project construction and operation would be below the

[3] The emissions from annual maintenance and testing of the emergency propane generator were not modeled as a separate point source, because the emissions account for about 5% or less of the total emissions for each criteria air pollutant.

CAAQS and NAAQS, and the impact from pollutant concentrations would be less than significant.

Table 14. Estimated Criteria Air Pollutant Concentrations at the Nearest Sensitive Receptor

Pollutant	Averaging Time	Units	Ambient Air Quality Standards		Concentrations at the Nearest Sensitive Receptor	
			CAAQS	NAAQS	Construction	Operation
PM_{10}	24-Hour	µg/m³	50	150	15.79	4.38
	Annual	µg/m³	20	---	15.79 [1]	0.73
$PM_{2.5}$	24-Hour	µg/m³	---	35	1.75	0.50
	Annual	µg/m³	12	12	1.75 [1]	0.08
NO_2	1-Hour	ppm	0.18	0.100	0.002	<0.001
	Annual	ppm	0.030	0.053	0.002 [1]	<0.001
CO	1-Hour	ppm	20	35	0.01	0.002
	8-Hour	ppm	9.0	9	0.01	0.002
SO_2	1-Hour	ppm	0.25	0.075	<0.001	<0.001
	24-Hour	ppm	0.04	0.14	<0.001	<0.001
	Annual	ppm	---	0.030	<0.001 [1]	<0.001

Notes: ppm = parts per million; µg/m³ = micrograms per cubic meter.
[1] Conservatively used the maximum 1-hour concentration for the annual average concentration.
Source: **Appendix C.**

There are two cumulative projects located within a 6 miles radius of the Project Application Area that have pending entitlements:

- The VEGA SES 4 Solar Energy Project (4.0 miles to the southwest)
- Viking Solar Energy Generation and Battery Storage Project (4.5 miles to the northwest)

Neither of these projects are proposing to operate a stationary source (e.g., emergency generator). Therefore, a protocol for a cumulative air quality modeling impacts analysis of the Project's typical operating mode in combination with other stationary emissions sources that have received construction permits but are not yet operational or are in the permitting process is not required.

6.3.2 Toxic Air Contaminants (TACs)

Construction activities would generate DPM emissions from off-road diesel construction equipment, helicopters, and on-road heavy-duty diesel trucks accessing the Project site that could potentially result in elevated health risks at nearby sensitive receptors. As described in Section 2.3, the Project site is located in a relatively remote region of Imperial County and there are no sensitive receptors within approximately three miles of the Project Application Area. According to CARB's *Land Use Compatibility Handbook* (CARB, 2005), concentrations of DPM are reduced substantially and can even be indistinguishable from upwind background concentrations at a distance of 1,000 feet downwind from sources such as freeways or large distribution centers. Therefore, sensitive receptors located more than three miles away are not expected to be affected by DPM emissions associated with the Project.

In addition, with implementation Project design feature PDF AQ-2, most of the construction offroad equipment that would be used for this Project would be equipped with Tier 4 engines, which are considered the best available technology for reducing DPM emissions. Operation and maintenance of the emergency propane generator would not generate DPM emissions. . Therefore, construction and operation of the Project would not expose existing sensitive receptors to substantial concentrations of TACs.

6.3.3 Valley Fever

Valley fever, also known as coccidioidomycosis, is a disease caused by inhaling spores of the fungus Coccidioides from airborne dust and soil. Coccidioides are thought to grow best in soil after heavy rainfall and then disperse into the air most effectively during hot, dry conditions. In California, most cases of Valley fever are reported among people residing in counties of the southern Central Valley and Central Coast. Coccidioides usually infect the lungs and can cause respiratory symptoms including cough, fever, chest pain, and tiredness.

Project construction activities such as grading would disturb the soil, which can cause fugitive dust emissions. The Project includes design feature PDF AQ-1 to control fugitive dust emissions during construction. As discussed above, PDF AQ-1 is consistent with the standard and discretionary mitigation measures for fugitive PM_{10} emissions recommended by the ICAPCD's *CEQA Air Quality Handbook* and the ICAPCD Regulation VIII fugitive dust rules. With implementation of PDF AQ-1, the Project would not expose existing people to substantial concentrations of fugitive dust that could potentially contain spores of the fungus Coccidioides.

6.4 Odors and Other Emissions

PV facility and BESS operations associated with the Project would not be expected to generate significant odors or other emissions for a substantial duration. Therefore, the Project would not generate odors or other emissions that would adversely affect a substantial number of people.

6.5 Greenhouse Gas Emissions

During construction, the Project would generate temporary GHG emissions through construction activities, such as operation of on-site heavy construction equipment, helicopters, water usage, and off-site construction vehicle trips. During operation, primary sources of GHG emissions would include operation and maintenance activities, on-road vehicles, land-use conversion, and SF_6 leakage from gas-insulated equipment. In addition, after commencing operation, the renewable electricity generated by the Project would displace the electricity generated by fossil fuels to meet energy demand.

There are two ways in which the Project could offset generation from conventional power sources: (1) production of solar power during daylight hours that displaces the daytime production from conventional, fossil fuel powered generators, and (2) discharge of stored energy from the BESS during evening or nighttime hours when the demand for conventional, fossil fuel powered generators is typical highest, thereby displacing evening/nighttime fossil generation.

While the solar PV component of the Project would provide power to the grid during daylight hours, the BESS component allows that power to be stored and discharged during high demand periods. The BESS component and energy storage in general helps to reduce the swing in demand for electricity from conventional, fossil fuel powered generators that is depicted by California's "duck curve." The "duck curve" is defined by the shape of net electricity demand over a typical day, where net demand, also referred to as net load, is the demand for electricity remaining after all electricity from variable sources of renewable electricity (e.g., solar, wind) have been dispatched. The pattern is characterized by drastic increases in net demand during the evening hours as solar generation decreases, and a net peak occurs later in the evening when solar generation fully drops off (U.S. EIA, 2023).

Energy storage provides an economic opportunity to shift the production of the Project to the hours of highest demand for electricity from dispatchable resources. The Project's dispatch strategy would use the BESS to respond to power price differentials. The battery system would be charged fully during the cheapest CAISO generation hours (i.e., during middle of the day when solar generation is highest and power prices are lowest across the grid, commonly referred to as the "belly of the duck"). Energy from the BESS would then be dispatched during the evening ramp after the sun goes down and power prices peak as natural gas-fired power plants must be dispatched rapidly to meet evening demand. The most common form of generation used to meet CAISO's evening demand peak is conventional combined cycle natural gas, so the above dispatch strategy for the BESS is expected be both charged and discharged fully each day.

This analysis demonstrates that by discharging stored energy to displace natural gas resources, the Perkins Project would avoid a greater quantity of GHG emissions being generated off-site than it would cause on-site. Detailed summaries of the estimated CO_2e emissions from Project construction and operation, as well as the avoided emissions by producing renewal electricity, are provided in **Appendix B** and **Appendix D**. The estimated GHG emissions for the Project are summarized in **Table 15**.

As shown in **Table 15**, the avoided GHG emissions by producing renewable electricity would significantly offset the GHG emissions from Project construction and operation. The Project would result in a net reduction in GHG emissions of approximately 251,953 metric tons of CO_2e per year. Therefore, Project construction and operation would not result in a cumulatively considerable net increase in GHG emissions.

Table 15. Annual Greenhouse Gas Emissions (Metric Tons per Year)

Source Scenario	CO_2e
Project Construction (30-year Amortized)[1]	553
Project Operation	988
Effects of Land Use Conversion	2,205
Gas-Insulated Equipment SF_6 Leakage	982
GHG Emissions Avoided by Producing Renewable Energy	-256,681

Total GHG Emissions	-251,953

Notes:
[1] GHG emissions during construction were amortized over the 30-year life of the project.
Source: **Appendix B** and **Appendix D.**

6.6 Greenhouse Gas Plans, Policies, and Regulations

Local climate action plans have not been adopted in the Project vicinity. The 2022 Scoping Plan outlines a roadmap for the State to achieve targets for carbon neutrality and reduce anthropogenic GHG emissions by 85 percent below 1990 levels no later than 2045 (CARB, 2022b). The 2022 Scoping Plan identifies actions and outcomes such as rapidly moving to zero-emission transportation; electrifying cars, buses, trains, and trucks; phasing out the use of fossil gas used for heating homes and buildings; clamping down on chemicals and refrigerants; providing communities with sustainable options for walking, biking, and public transit; building out clean, renewable energy resources (such as solar arrays and wind turbine capacity) to displace fossil-fuel fired electrical generation; and scaling up new options such as renewable hydrogen and biomethane.

The Project would build a PV facility and BESS, supporting the displacement of electrical generation by fossil fuels from conventional power plants with a renewable energy resource. Therefore, the Project would not conflict with the 2022 Scoping Plan.

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APPENDICES

APPENDIX A

AIR QUALITY AND GREENHOUSE GAS EMISSION CALCULATION DETAILS

IP Perkins, LLC - Construction, Activity Estimates

Construction - Phasing Assumptions, input to CalEEMod

20	work days per month

Total (months)	Start	End
24	1/2/2026	1/2/2028

Seq.	Phase	Duration (work days)	Duration (months)	Start	End
1	Ph 1: Site Preparation (~5,800 acres)	100	5	1/2/2026	6/2/2026
2	Ph 2: PV Panel System (500-1,150 MW)	150	8	4/2/2026	11/2/2026
3	Ph 3: Inverters, Substation, Electrical	150	8	9/2/2026	4/2/2027
4	Ph 4: Gen-tie and Loop-in Transmission	30	2	2/2/2027	3/2/2027
5	Ph 5: Battery Storage (500-1,150 MW)	160	8	2/2/2027	10/2/2027
6	Ph 6: Utility Switchyard (500 kV)	200	10	2/2/2027	12/2/2027

For CalEEMod Assumptions:

Basis: Project Description: Plan of Development, v8, circa 11/30/2023

- Work occurs 5 days a week, up to 10 hr/day; ~ 6,125 ac site. Appx 24-month construction duration.
- POD for PV generation between 500 to 1,150 MW, w/ storage BESS.
- On-road motor vehicle trips are counted as one-way for emissions. Average haul trip length to APCD boundary = 70 mi. Hauling up to 110 RT/d includes water delivery.
- On-road hauling up to 220 one-way (110 roundtrips) per day includes 80 for materials plus 30 water trucks.

IP Perkins - Construction, Air Pollutants - Unmitigated

Duration of Construction: **24 months**

Peak Days, Unmitigated Emissions Summary (lbs/day)

	ROG	NOX	CO	SO2	PM10	PM2.5
Ph 1 + Ph 2	**60.58**	**541.71**	**647.72**	**1.01**	**564.07**	**80.14**
Ph 2 + Ph 3	**65.02**	**434.33**	**634.74**	**0.96**	**812.63**	**102.13**
Ph 3 + Ph 4 + Ph 5 + Ph 6	**53.07**	**262.14**	**412.83**	**0.78**	**716.86**	**84.40**
Peak Day of Emissions (lbs/day)	**65.02**	**541.71**	**647.72**	**1.01**	**812.63**	**102.13**

Unmitigated - Duration of Construction (tons)

ROG	NOX	CO	SO2	PM10	PM2.5
7.14	54.53	72.88	0.12	88.21	11.30

Phased Unmitigated Emissions Summary (lbs/day)

	ROG	NOX	CO	SO2	PM10	PM2.5
Ph 1: Site Preparation (~5,800 acres)	**20.69**	**211.90**	**219.96**	**0.35**	**142.99**	**22.93**
Ph 2: PV Panel System (500-1,150 MW)	**39.90**	**329.81**	**427.75**	**0.66**	**421.08**	**57.21**
Ph 3: Inverters, Substation, Electrical	**25.12**	**104.52**	**206.98**	**0.30**	**391.55**	**44.92**
Ph 4: Gen-tie and Loop-in Transmission	**17.01**	**37.25**	**54.40**	**0.12**	**118.02**	**13.61**
Ph 5: Battery Storage (500-1,150 MW)	**5.78**	**61.98**	**84.08**	**0.18**	**119.19**	**14.66**
Ph 6: Utility Switchyard (500 kV)	**5.16**	**58.39**	**67.38**	**0.17**	**88.09**	**11.21**
Daily Emissions by Phase (lbs/day)	**39.90**	**329.81**	**427.75**	**0.66**	**421.08**	**57.21**

Unmitigated - Duration of Construction, Annual Average Rate (tons/year)

ROG	NOX	CO	SO2	PM10	PM2.5
3.57	27.26	36.44	0.06	44.11	5.65

Unmitigated - Duration of Construction, Average Daily Rate (lbs/day)

ROG	NOX	CO	SO2	PM10	PM2.5
19.57	149.39	199.68	0.34	241.68	30.97

Offroad Equipment by Phase / **Offroad, Daily Emissions (lbs/day)**

Offroad Equipment by Phase	Duration (work days)	ROG	NOX	CO	SO2	PM10	PM2.5
Ph 1: Site Preparation (~5,800 acres)	100	19.41	205.19	183.39	0.31	8.44	7.77
Ph 2: PV Panel System (500-1,150 MW)	150	36.18	298.15	323.64	0.49	13.77	12.65
Ph 3: Inverters, Substation, Electrical	150	6.81	68.10	84.98	0.14	2.93	2.70
Ph 4: Gen-tie and Loop-in Transmission	30	1.72	17.95	23.57	0.04	0.60	0.55
Ph 5: Battery Storage (500-1,150 MW)	160	4.90	49.29	62.14	0.10	1.99	1.83
Ph 6: Utility Switchyard (500 kV)	200	4.65	46.31	55.44	0.09	1.79	1.64

Offroad, Subtotals (tons)

ROG	NOX	CO	SO2	PM10	PM2.5
0.97	10.26	9.17	0.02	0.42	0.39
2.71	22.36	24.27	0.04	1.03	0.95
0.51	5.11	6.37	0.01	0.22	0.20
0.03	0.27	0.35	0.00	0.01	0.01
0.39	3.94	4.97	0.01	0.16	0.15
0.46	4.63	5.54	0.01	0.18	0.16

Offroad, Grading Equipment Passes / **Grading, Daily Emissions (lbs/day)** / **Grading, Subtotals (tons)**

Offroad, Grading Equipment Passes	Duration (work days)	PM10 (lbs/day)	PM2.5 (lbs/day)	PM10 (tons)	PM2.5 (tons)
Ph 1: Site Preparation (~5,800 acres)	100	13.26	2.21	0.66	0.11
Ph 2: PV Panel System (500-1,150 MW)	150	7.95	1.32	0.60	0.10

Offroad Equipment and Grading on Peak Days / **Offroad, Emissions on Peak Days (lbs/day)**

	ROG	NOX	CO	SO2	PM10	PM2.5
Ph 1 + Ph 2	55.58	503.34	507.04	0.80	43.41	23.96
Ph 2 + Ph 3	42.99	366.24	408.62	0.63	24.65	16.68
Ph 3 + Ph 4 + Ph 5 + Ph 6	18.08	181.65	226.12	0.38	7.31	6.73

Onroad Vehicles by Phase / **Onroad, Daily Emissions (lbs/day)**

Onroad Vehicles by Phase	Duration (work days)	ROG	NOX	CO	SO2	PM10	PM2.5
Ph 1: Site Preparation (~5,800 acres)	100	1.28	6.71	36.57	0.04	121.30	12.95
Ph 2: PV Panel System (500-1,150 MW)	150	3.72	31.66	104.11	0.17	399.36	43.23
Ph 3: Inverters, Substation, Electrical	150	3.68	29.81	103.61	0.16	388.40	42.00
Ph 4: Gen-tie and Loop-in Transmission	30	0.66	12.69	12.44	0.08	117.20	12.83
Ph 5: Battery Storage (500-1,150 MW)	160	0.88	12.69	21.94	0.08	117.20	12.83
Ph 6: Utility Switchyard (500 kV)	200	0.51	12.08	11.94	0.08	86.30	9.57

Onroad, Subtotals (tons)

ROG	NOX	CO	SO2	PM10	PM2.5
0.06	0.34	1.83	0.00	6.07	0.65
0.28	2.37	7.81	0.01	29.95	3.24
0.28	2.24	7.77	0.01	29.13	3.15
0.01	0.19	0.19	0.00	1.76	0.19
0.07	1.02	1.76	0.01	9.38	1.03
0.05	1.21	1.19	0.01	8.63	0.96

Onroad Vehicles on Peak Days / **Onroad, Emissions on Peak Days (lbs/day)**

	ROG	NOX	CO	SO2	PM10	PM2.5
Ph 1 + Ph 2	5.00	38.37	140.68	0.21	520.66	56.18
Ph 2 + Ph 3	7.40	61.47	207.72	0.33	787.76	85.23
Ph 3 + Ph 4 + Ph 5 + Ph 6	5.73	67.27	149.93	0.40	709.10	77.23

IP Perkins - Construction, Air Pollutants - Unmitigated

Helicopters	Duration (work days)
Ph 3: Inverters, Substation, Electrical	150
Ph 4: Gen-tie and Loop-in Transmission	30

Helicopter, Daily Emissions (lbs/day)					
ROG	NOX	CO	SO2	PM10	PM2.5
14.63	6.61	18.39		0.22	0.22
14.63	6.61	18.39		0.22	0.22

Helicopter, Subtotals (tons)					
ROG	NOX	CO	SO2	PM10	PM2.5
1.10	0.50	1.38	0.00	0.02	0.02
0.22	0.10	0.28	0.00	0.00	0.00

IP Perkins - Construction, Air Pollutants - Mitigated

Duration of Construction: **24 months**

Peak Days, Mitigated Emissions Summary (lbs/day)

	ROG	NOX	CO	SO2	PM10	PM2.5
Ph 1 + Ph 2	14.69	188.32	656.80	1.01	524.88	58.24
Ph 2 + Ph 3	30.02	209.58	654.14	0.96	789.74	86.82
Ph 3 + Ph 4 + Ph 5 + Ph 6	39.65	160.54	441.01	0.78	708.84	78.25
Peak Day of Emissions (lbs/day)	39.65	209.58	656.80	1.01	789.74	86.82

Mitigated - Duration of Construction (tons)

ROG	NOX	CO	SO2	PM10	PM2.5
3.06	24.26	75.59	0.12	85.15	9.41

Phased Mitigated Emissions Summary (lbs/day)

	ROG	NOX	CO	SO2	PM10	PM2.5
Ph 1: Site Preparation (~5,800 acres)	4.60	38.45	220.04	0.35	123.67	13.88
Ph 2: PV Panel System (500-1,150 MW)	10.08	149.88	436.76	0.66	401.21	44.37
Ph 3: Inverters, Substation, Electrical	19.94	59.71	217.38	0.30	388.54	42.46
Ph 4: Gen-tie and Loop-in Transmission	15.88	32.63	58.70	0.12	117.14	13.09
Ph 5: Battery Storage (500-1,150 MW)	2.16	34.79	92.41	0.18	117.04	12.99
Ph 6: Utility Switchyard (500 kV)	1.67	33.41	72.52	0.17	86.12	9.71
Daily Emissions by Phase (lbs/day)	19.94	149.88	436.76	0.66	401.21	44.37

Mitigated - Duration of Construction, Annual Average Rate (tons/year)

ROG	NOX	CO	SO2	PM10	PM2.5
1.53	12.13	37.79	0.06	42.57	4.71

Mitigated - Duration of Construction, Average Daily Rate (lbs/day)

ROG	NOX	CO	SO2	PM10	PM2.5
8.38	66.45	207.09	0.34	233.28	25.79

Offroad Equipment by Phase — Offroad, Daily Emissions (lbs/day)

Offroad Equipment by Phase	Duration (work days)	ROG	NOX	CO	SO2	PM10	PM2.5
Ph 1: Site Preparation (~5,800 acres)	100	3.32	31.74	183.47	0.31	0.61	0.61
Ph 2: PV Panel System (500-1,150 MW)	150	6.36	118.22	332.65	0.49	0.97	0.97
Ph 3: Inverters, Substation, Electrical	150	1.63	23.29	95.38	0.14	0.27	0.27
Ph 4: Gen-tie and Loop-in Transmission	30	0.59	13.33	27.87	0.04	0.08	0.08
Ph 5: Battery Storage (500-1,150 MW)	160	1.28	22.10	70.47	0.10	0.20	0.20
Ph 6: Utility Switchyard (500 kV)	200	1.16	21.33	60.58	0.09	0.18	0.18

Offroad, Subtotals (tons)

	ROG	NOX	CO	SO2	PM10	PM2.5
Ph 1	0.17	1.59	9.17	0.02	0.03	0.03
Ph 2	0.48	8.87	24.95	0.04	0.07	0.07
Ph 3	0.12	1.75	7.15	0.01	0.02	0.02
Ph 4	0.01	0.20	0.42	0.00	0.00	0.00
Ph 5	0.10	1.77	5.64	0.01	0.02	0.02
Ph 6	0.12	2.13	6.06	0.01	0.02	0.02

Offroad, Grading Equipment Passes — Grading, Daily Emissions (lbs/day) / Grading, Subtotals (tons)

Offroad, Grading Equipment Passes	Duration (work days)	PM10 (lbs/day)	PM2.5 (lbs/day)	PM10 (tons)	PM2.5 (tons)
Ph 1: Site Preparation (~5,800 acres)	100	2.12	0.35	0.11	0.02
Ph 2: PV Panel System (500-1,150 MW)	150	1.27	0.21	0.10	0.02

Offroad Equipment and Grading on Peak Days — Offroad, Emissions on Peak Days (lbs/day)

	ROG	NOX	CO	SO2	PM10	PM2.5
Ph 1 + Ph 2	9.69	149.95	516.12	0.80	4.98	2.15
Ph 2 + Ph 3	7.99	141.50	428.03	0.63	2.52	1.46
Ph 3 + Ph 4 + Ph 5 + Ph 6	4.65	80.05	254.30	0.38	0.73	0.73

Onroad Vehicles by Phase — Onroad, Daily Emissions (lbs/day)

Onroad Vehicles by Phase	Duration (work days)	ROG	NOX	CO	SO2	PM10	PM2.5
Ph 1: Site Preparation (~5,800 acres)	100	1.28	6.71	36.57	0.04	120.94	12.91
Ph 2: PV Panel System (500-1,150 MW)	150	3.72	31.66	104.11	0.17	398.96	43.18
Ph 3: Inverters, Substation, Electrical	150	3.68	29.81	103.61	0.16	388.04	41.96
Ph 4: Gen-tie and Loop-in Transmission	30	0.66	12.69	12.44	0.08	116.84	12.79
Ph 5: Battery Storage (500-1,150 MW)	160	0.88	12.69	21.94	0.08	116.84	12.79
Ph 6: Utility Switchyard (500 kV)	200	0.51	12.08	11.94	0.08	85.94	9.53

Onroad, Subtotals (tons)

	ROG	NOX	CO	SO2	PM10	PM2.5
Ph 1	0.06	0.34	1.83	0.00	6.05	0.65
Ph 2	0.28	2.37	7.81	0.01	29.92	3.24
Ph 3	0.28	2.24	7.77	0.01	29.10	3.15
Ph 4	0.01	0.19	0.19	0.00	1.75	0.19
Ph 5	0.07	1.02	1.76	0.01	9.35	1.02
Ph 6	0.05	1.21	1.19	0.01	8.59	0.95

Onroad Vehicles on Peak Days — Onroad, Emissions on Peak Days (lbs/day)

	ROG	NOX	CO	SO2	PM10	PM2.5
Ph 1 + Ph 2	5.00	38.37	140.68	0.21	519.90	56.09
Ph 2 + Ph 3	7.40	61.47	207.72	0.33	787.00	85.14
Ph 3 + Ph 4 + Ph 5 + Ph 6	5.73	67.27	149.93	0.40	707.66	77.07

IP Perkins - Construction, Air Pollutants - Mitigated

Helicopters	Duration (work days)
Ph 3: Inverters, Substation, Electrical	150
Ph 4: Gen-tie and Loop-in Transmission	30

Helicopter, Daily Emissions (lbs/day)					
ROG	NOX	CO	SO2	PM10	PM2.5
14.63	6.61	18.39		0.22	0.22
14.63	6.61	18.39		0.22	0.22

Helicopter, Subtotals (tons)					
ROG	NOX	CO	SO2	PM10	PM2.5
1.10	0.50	1.38	0.00	0.02	0.02
0.22	0.10	0.28	0.00	0.00	0.00

IP Perkins - Construction, GHG Emissions

Construction,GHG Emissions - by Phase, by Activity	CO2e (MT)
Offroad Equipment	
Ph 1: Site Preparation (~5,800 acres)	1,476
Ph 2: PV Panel System (500-1,150 MW)	3,624
Ph 3: Inverters, Substation, Electrical	991
Ph 4: Gen-tie and Loop-in Transmission	59
Ph 5: Battery Storage (500-1,150 MW)	785
Ph 6: Utility Switchyard (500 kV)	861
Helicopters	362
Onroad Vehicles	
2026	4,568
2027	3,528
Subtotal Offroad Equipment, Helicopters, Vehicles	8,157
Subtotal Onroad Vehicles	8,096
Subtotal Construction Water Use	321
Total, Duration of Construction	**16,574**

Offroad Equipment	Days/Phase	CO2 (MT)	CH4 (MT)	N2O (MT)	CO2e (MT)
Ph 1: Site Preparation (~5,800 acres)	100	**1,471**	**5.85E-02**	**1.11E-02**	**1,476**
Ph 2: PV Panel System (500-1,150 MW)	150	**3,612**	**1.45E-01**	**2.84E-02**	**3,624**
Ph 3: Inverters, Substation, Electrical	150	**988**	**3.93E-02**	**7.56E-03**	**991**
Ph 4: Gen-tie and Loop-in Transmission	30	**59**	**2.35E-03**	**4.55E-04**	**59**
Ph 5: Battery Storage (500-1,150 MW)	160	**782**	**3.11E-02**	**6.01E-03**	**785**
Ph 6: Utility Switchyard (500 kV)	200	**858**	**3.42E-02**	**6.64E-03**	**861**
	Total (MT)	**7,770**	**0.31**	**0.06**	**7,795**

Onroad Vehicles by Year	CO2e (MT)
2026	4,568
2027	3,528

Helicopters	CO2e (MT)
Helicoper, e.g. Ph 3 to Ph 4	362.0

Energy Intensity of Water Supply	CO2e (MT)
Construction Water Use	321.1

IP Perkins - Construction, Offroad Equipment - Unmitigated

Offroad Equipment Use

	CalEEMod Type Offroad Equipment	Hours Per Day	Fuel Type	Rating (hp)	Load Factor	500 MW Quantity	1150 MW Quantity	Unmitigated Emission Factors (g/hp-hr)							Unmitigated Max Daily Emissions (1150MW) (lbs/day)						
								TOG	ROG	NOX	CO	SO2	PM10	PM2.5	TOG	ROG	NOX	CO	SO2	PM10	PM2.5
Ph 1: Site Preparation (~5,800 acres)	Skid Steer Loaders	8	Diesel	65	0.37	6	15	0.159	0.134	1.807	3.245	0.005	0.051	0.047	1.01	0.85	11.50	20.65	0.03	0.32	0.30
	Rubber Tired Dozers	8	Diesel	247	0.40	6	15	0.567	0.477	5.081	3.568	0.005	0.225	0.207	14.82	12.47	132.81	93.26	0.13	5.88	5.41
	Tractors/Loaders/Backhoes	8	Diesel	97	0.37	6	15	0.219	0.184	1.885	3.481	0.005	0.063	0.058	2.08	1.75	17.90	33.05	0.05	0.60	0.55
	Graders	8	Diesel	187	0.41	5	10	0.261	0.219	2.119	1.197	0.005	0.071	0.066	3.53	2.96	28.65	16.19	0.07	0.96	0.89
	Rollers	8	Diesel	80	0.38	4	8	0.274	0.231	2.484	3.411	0.005	0.116	0.106	1.18	0.99	10.65	14.63	0.02	0.50	0.45
	Forklifts	8	Diesel	89	0.20	2	5	0.293	0.246	2.342	3.579	0.005	0.112	0.103	0.46	0.39	3.68	5.62	0.01	0.18	0.16
															23.08	**19.41**	**205.19**	**183.39**	**0.31**	**8.44**	**7.77**
Ph 2: PV Panel System (500-1,150 MW)	Cranes	8	Diesel	231	0.29	2	5	0.297	0.25	2.511	1.484	0.005	0.104	0.096	1.75	1.48	14.83	8.77	0.03	0.61	0.57
	Aerial Lifts	8	Diesel	63	0.31	4	10	0.122	0.103	1.553	3.162	0.005	0.031	0.028	0.42	0.35	5.35	10.89	0.02	0.11	0.10
	Skid Steer Loaders	8	Diesel	65	0.37	5	15	0.159	0.134	1.807	3.245	0.005	0.051	0.047	1.01	0.85	11.50	20.65	0.03	0.32	0.30
	Rubber Tired Dozers	8	Diesel	247	0.40	4	8	0.567	0.477	5.081	3.568	0.005	0.225	0.207	7.90	6.65	70.83	49.74	0.07	3.14	2.89
	Rubber Tired Loaders	8	Diesel	203	0.36	0	0	0.208	0.175	1.337	1.166	0.005	0.045	0.041	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Welders	8	Diesel	46	0.45	2	5	0.562	0.465	3.57	4.493	0.007	0.095	0.088	1.03	0.85	6.52	8.20	0.01	0.17	0.16
	Trenchers	8	Diesel	78	0.50	2	5	0.45	0.378	3.728	3.617	0.005	0.232	0.213	1.55	1.30	12.82	12.44	0.02	0.80	0.73
	Forklifts	8	Diesel	89	0.20	8	16	0.293	0.246	2.342	3.579	0.005	0.112	0.103	1.47	1.24	11.76	17.98	0.03	0.56	0.52
	Bore/Drill Rigs	8	Diesel	221	0.50	2	3	0.139	0.116	1.073	1.061	0.005	0.035	0.032	0.81	0.68	6.27	6.20	0.03	0.20	0.19
	Graders	8	Diesel	187	0.41	3	7	0.261	0.219	2.119	1.197	0.005	0.071	0.066	2.47	2.07	20.06	11.33	0.05	0.67	0.62
	Rollers	8	Diesel	80	0.38	3	7	0.274	0.231	2.484	3.411	0.005	0.116	0.106	1.03	0.87	9.32	12.80	0.02	0.44	0.40
	Tractors/Loaders/Backhoes	8	Diesel	97	0.37	10	20	0.219	0.184	1.885	3.481	0.005	0.063	0.058	2.77	2.33	23.86	44.07	0.06	0.80	0.73
	Other Construction Equipment	9	Diesel	48	0.45	30	60	0.811	0.681	4.084	4.689	0.005	0.231	0.212	20.85	17.51	105.02	120.58	0.13	5.94	5.45
															43.07	**36.18**	**298.15**	**323.64**	**0.49**	**13.77**	**12.65**
Ph 3: Inverters, Substation, Electrical	Skid Steer Loaders	8	Diesel	65	0.37	3	7	0.159	0.134	1.807	3.245	0.005	0.051	0.047	0.47	0.40	5.37	9.63	0.01	0.15	0.14
	Cranes	8	Diesel	231	0.29	2	5	0.297	0.25	2.511	1.484	0.005	0.104	0.096	1.75	1.48	14.83	8.77	0.03	0.61	0.57
	Aerial Lifts	8	Diesel	63	0.31	2	5	0.122	0.103	1.553	3.162	0.005	0.031	0.028	0.21	0.18	2.67	5.45	0.01	0.05	0.05
	Forklifts	8	Diesel	89	0.20	5	12	0.293	0.246	2.342	3.579	0.005	0.112	0.103	1.10	0.93	8.82	13.48	0.02	0.42	0.39
	Trenchers	8	Diesel	78	0.50	3	7	0.45	0.378	3.728	3.617	0.005	0.232	0.213	2.17	1.82	17.95	17.42	0.02	1.12	1.03
	Welders	8	Diesel	46	0.45	2	5	0.562	0.465	3.57	4.493	0.007	0.095	0.088	1.03	0.85	6.52	8.20	0.01	0.17	0.16
	Tractors/Loaders/Backhoes	8	Diesel	97	0.37	4	10	0.219	0.184	1.885	3.481	0.005	0.063	0.058	1.39	1.16	11.93	22.03	0.03	0.40	0.37
															8.12	**6.81**	**68.10**	**84.98**	**0.14**	**2.93**	**2.70**
Ph 4: Gen-tie and Loop-in Transmission	Skid Steer Loaders	8	Diesel	65	0.37	1	2	0.159	0.134	1.807	3.245	0.005	0.051	0.047	0.13	0.11	1.53	2.75	0.00	0.04	0.04
	Cranes	8	Diesel	231	0.29	1	2	0.297	0.25	2.511	1.484	0.005	0.104	0.096	0.70	0.59	5.93	3.51	0.01	0.25	0.23
	Aerial Lifts	8	Diesel	63	0.31	3	8	0.122	0.103	1.553	3.162	0.005	0.031	0.028	0.34	0.28	4.28	8.71	0.01	0.09	0.08
	Welders	10	Diesel	46	0.45	1	2	0.562	0.465	3.57	4.493	0.007	0.095	0.088	0.51	0.42	3.26	4.10	0.01	0.09	0.08
	Forklifts	8	Diesel	89	0.20	2	4	0.293	0.246	2.342	3.579	0.005	0.112	0.103	0.37	0.31	2.94	4.49	0.01	0.14	0.13
															2.05	**1.72**	**17.95**	**23.57**	**0.04**	**0.60**	**0.55**
Ph 5: Battery Storage (500-1,150 MW)	Skid Steer Loaders	8	Diesel	65	0.37	4	6	0.159	0.134	1.807	3.245	0.005	0.051	0.047	0.40	0.34	4.60	8.26	0.01	0.13	0.12
	Cranes	8	Diesel	231	0.29	2	4	0.297	0.25	2.511	1.484	0.005	0.104	0.096	1.40	1.18	11.87	7.01	0.02	0.49	0.45
	Aerial Lifts	8	Diesel	63	0.31	3	7	0.122	0.103	1.553	3.162	0.005	0.031	0.028	0.29	0.25	3.74	7.62	0.01	0.07	0.07
	Forklifts	8	Diesel	89	0.20	6	7	0.293	0.246	2.342	3.579	0.005	0.112	0.103	0.64	0.54	5.15	7.87	0.01	0.25	0.23
	Trenchers	8	Diesel	78	0.50	2	4	0.45	0.378	3.728	3.617	0.005	0.232	0.213	1.24	1.04	10.26	9.95	0.01	0.64	0.59
	Welders	10	Diesel	46	0.45	2	4	0.562	0.465	3.57	4.493	0.007	0.095	0.088	1.03	0.85	6.52	8.20	0.01	0.17	0.16
	Tractors/Loaders/Backhoes	8	Diesel	97	0.37	4	6	0.219	0.184	1.885	3.481	0.005	0.063	0.058	0.83	0.70	7.16	13.22	0.02	0.24	0.22
															5.84	**4.90**	**49.29**	**62.14**	**0.10**	**1.99**	**1.83**
Ph 6: Utility Switchyard (500 kV)	Cranes	8	Diesel	231	0.29	1	2	0.297	0.25	2.511	1.484	0.005	0.104	0.096	0.70	0.59	5.93	3.51	0.01	0.25	0.23
	Aerial Lifts	8	Diesel	63	0.31	4	8	0.122	0.103	1.553	3.162	0.005	0.031	0.028	0.34	0.28	4.28	8.71	0.01	0.09	0.08
	Skid Steer Loaders	8	Diesel	65	0.37	2	4	0.159	0.134	1.807	3.245	0.005	0.051	0.047	0.27	0.23	3.07	5.51	0.01	0.09	0.08
	Rubber Tired Loaders	8	Diesel	203	0.36	1	1	0.208	0.175	1.337	1.166	0.005	0.045	0.041	0.27	0.23	1.72	1.50	0.01	0.06	0.05
	Rubber Tired Dozers	8	Diesel	247	0.40	1	1	0.567	0.477	5.081	3.568	0.005	0.225	0.207	0.99	0.83	8.85	6.22	0.01	0.39	0.36
	Welders	10	Diesel	46	0.45	3	5	0.562	0.465	3.57	4.493	0.007	0.095	0.088	1.28	1.06	8.15	10.25	0.02	0.22	0.20

IP Perkins - Construction, Offroad Equipment - Unmitigated

Offroad Equipment Use

CalEEMod Type Offroad Equipment	Hours Per Day	Fuel Type	Rating (hp)	Load Factor	500 MW Quantity	1150 MW Quantity	Unmitigated Emission Factors (g/hp-hr) TOG	ROG	NOX	CO	SO2	PM10	PM2.5	Unmitigated Max Daily Emissions (1150MW) (lbs/day) TOG	ROG	NOX	CO	SO2	PM10	PM2.5
Trenchers	8	Diesel	78	0.50	1	2	0.45	0.378	3.728	3.617	0.005	0.232	0.213	0.62	0.52	5.13	4.98	0.01	0.32	0.29
Forklifts	8	Diesel	89	0.20	2	4	0.293	0.246	2.342	3.579	0.005	0.112	0.103	0.37	0.31	2.94	4.49	0.01	0.14	0.13
Bore/Drill Rigs	10	Diesel	221	0.50	0	0	0.139	0.116	1.073	1.061	0.005	0.035	0.032	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Graders	8	Diesel	187	0.41	0	0	0.261	0.219	2.119	1.197	0.005	0.071	0.066	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rollers	8	Diesel	80	0.38	1	2	0.274	0.231	2.484	3.411	0.005	0.116	0.106	0.29	0.25	2.66	3.66	0.01	0.12	0.11
Tractors/Loaders/Backhoes	8	Diesel	97	0.37	2	3	0.219	0.184	1.885	3.481	0.005	0.063	0.058	0.42	0.35	3.58	6.61	0.01	0.12	0.11
														5.54	**4.65**	**46.31**	**55.44**	**0.09**	**1.79**	**1.64**

IP Perkins - Construction, Offroad Equipment - Unmitiga

Offroad Equipment Use

	CalEEMod Type Offroad Equipment	GHG (g/hp-hr)			GHG (MT/day)		
		CO2	CH4	N2O	CO2	CH4	N2O
Ph 1: Site Preparation (~5,800 acres)	Skid Steer Loaders	528.621	0.021	0.004	1.53	6.06E-05	1.15E-05
	Rubber Tired Dozers	528.489	0.021	0.004	6.27	2.49E-04	4.74E-05
	Tractors/Loaders/Backhoes	529.707	0.021	0.004	2.28	9.04E-05	1.72E-05
	Graders	527.697	0.021	0.004	3.24	1.29E-04	2.45E-05
	Rollers	528.012	0.021	0.004	1.03	4.09E-05	7.78E-06
	Forklifts	527.097	0.021	0.004	0.38	1.50E-05	2.85E-06
					14.71	**5.85E-04**	**1.11E-04**
Ph 2: PV Panel System (500-1,150 MW)	Cranes	527.563	0.021	0.004	1.41	5.63E-05	1.07E-05
	Aerial Lifts	527.871	0.021	0.004	0.82	3.28E-05	6.25E-06
	Skid Steer Loaders	528.621	0.021	0.004	1.53	6.06E-05	1.15E-05
	Rubber Tired Dozers	528.489	0.021	0.004	3.34	1.33E-04	2.53E-05
	Rubber Tired Loaders	526.593	0.021	0.004	0.00	0.00E+00	0.00E+00
	Welders	568.291	0.023	0.005	0.47	1.90E-05	4.14E-06
	Trenchers	529.355	0.021	0.004	0.83	3.28E-05	6.24E-06
	Forklifts	527.097	0.021	0.004	1.20	4.78E-05	9.11E-06
	Bore/Drill Rigs	525.411	0.021	0.004	1.39	5.57E-05	1.06E-05
	Graders	527.697	0.021	0.004	2.27	9.02E-05	1.72E-05
	Rollers	528.012	0.021	0.004	0.90	3.58E-05	6.81E-06
	Tractors/Loaders/Backhoes	529.707	0.021	0.004	3.04	1.21E-04	2.30E-05
	Other Construction Equipment	589.469	0.024	0.005	6.88	2.80E-04	5.83E-05
					24.08	**9.64E-04**	**1.89E-04**
Ph 3: Inverters, Substation, Electrical	Skid Steer Loaders	528.621	0.021	0.004	0.71	2.83E-05	5.39E-06
	Cranes	527.563	0.021	0.004	1.41	5.63E-05	1.07E-05
	Aerial Lifts	527.871	0.021	0.004	0.41	1.64E-05	3.12E-06
	Forklifts	527.097	0.021	0.004	0.90	3.59E-05	6.84E-06
	Trenchers	529.355	0.021	0.004	1.16	4.59E-05	8.74E-06
	Welders	568.291	0.023	0.005	0.47	1.90E-05	4.14E-06
	Tractors/Loaders/Backhoes	529.707	0.021	0.004	1.52	6.03E-05	1.15E-05
					6.59	**2.62E-04**	**5.04E-05**
Ph 4: Gen-tie and Loop-in Transmission	Skid Steer Loaders	528.621	0.021	0.004	0.20	8.08E-06	1.54E-06
	Cranes	527.563	0.021	0.004	0.57	2.25E-05	4.29E-06
	Aerial Lifts	527.871	0.021	0.004	0.66	2.62E-05	5.00E-06
	Welders	568.291	0.023	0.005	0.24	9.52E-06	2.07E-06
	Forklifts	527.097	0.021	0.004	0.30	1.20E-05	2.28E-06
					1.96	**7.83E-05**	**1.52E-05**
Ph 5: Battery Storage (500-1,150 MW)	Skid Steer Loaders	528.621	0.021	0.004	0.61	2.42E-05	4.62E-06
	Cranes	527.563	0.021	0.004	1.13	4.50E-05	8.57E-06
	Aerial Lifts	527.871	0.021	0.004	0.58	2.30E-05	4.37E-06
	Forklifts	527.097	0.021	0.004	0.53	2.09E-05	3.99E-06
	Trenchers	529.355	0.021	0.004	0.66	2.62E-05	4.99E-06
	Welders	568.291	0.023	0.005	0.47	1.90E-05	4.14E-06
	Tractors/Loaders/Backhoes	529.707	0.021	0.004	0.91	3.62E-05	6.89E-06
					4.89	**1.95E-04**	**3.76E-05**
Ph 6: Utility Switchyard (500 kV)	Cranes	527.563	0.021	0.004	0.57	2.25E-05	4.29E-06
	Aerial Lifts	527.871	0.021	0.004	0.66	2.62E-05	5.00E-06
	Skid Steer Loaders	528.621	0.021	0.004	0.41	1.62E-05	3.08E-06
	Rubber Tired Loaders	526.593	0.021	0.004	0.31	1.23E-05	2.34E-06
	Rubber Tired Dozers	528.489	0.021	0.004	0.42	1.66E-05	3.16E-06
	Welders	568.291	0.023	0.005	0.59	2.38E-05	5.18E-06

IP Perkins - Construction, Offroad Equipment - Unmitiga

Offroad Equipment Use

	CalEEMod Type Offroad Equipment	GHG (g/hp-hr)			GHG (MT/day)		
		CO2	**CH4**	**N2O**	**CO2**	**CH4**	**N2O**
	Trenchers	529.355	0.021	0.004	0.33	1.31E-05	2.50E-06
	Forklifts	527.097	0.021	0.004	0.30	1.20E-05	2.28E-06
	Bore/Drill Rigs	525.411	0.021	0.004	0.00	0.00E+00	0.00E+00
	Graders	527.697	0.021	0.004	0.00	0.00E+00	0.00E+00
	Rollers	528.012	0.021	0.004	0.26	1.02E-05	1.95E-06
	Tractors/Loaders/Backhoes	529.707	0.021	0.004	0.46	1.81E-05	3.45E-06
					4.29	**0.000**	**0.000**

IP Perkins - Construction, Offroad Equipment - Mitigated

Offroad Equipment Use

						500 MW	1150 MW	Mitigated Emission Factors (g/hp-hr)							Mitigated Max Daily Emissions (lbs/day)						
	CalEEMod Type Offroad Equipment	Hours Per Day	Fuel Type	Rating (hp)	Load Factor	Quantity	Quantity	TOG	ROG	NOX	CO		PM10	PM2.5	TOG	ROG	NOX	CO		PM10	PM2.5
Ph 1: Site Preparation (~5,800 acres)	Skid Steer Loaders	8	Diesel	65	0.37	6	15	0.09	0.09	2.74	3.7		0.01	0.01	0.57	0.57	17.43	23.54		0.06	0.06
	Rubber Tired Dozer	8	Diesel	247	0.40	6	15	0.05	0.05	0.26	2.6		0.01	0.01	1.31	1.31	6.80	67.96		0.26	0.26
	Tractor/Loader/Backhoe	8	Diesel	97	0.37	6	15	0.05	0.05	0.26	3.7		0.01	0.01	0.47	0.47	2.47	35.13		0.09	0.09
	Grader	8	Diesel	187	0.41	5	10	0.05	0.05	0.26	2.6		0.01	0.01	0.68	0.68	3.52	35.16		0.14	0.14
	Roller	8	Diesel	80	0.38	4	8	0.05	0.05	0.26	3.7		0.01	0.01	0.21	0.21	1.12	15.87		0.04	0.04
	Forklift	8	Diesel	89	0.20	2	5	0.05	0.05	0.26	3.7		0.01	0.01	0.08	0.08	0.41	5.81		0.02	0.02
															3.32	**3.32**	**31.74**	**183.47**		**0.61**	**0.61**
Ph 2: PV Panel System (500-1,150 MW)	Crane	8	Diesel	231	0.29	2	5	0.05	0.05	0.26	2.6		0.01	0.01	0.30	0.30	1.54	15.36		0.06	0.06
	Aerial Lift	8	Diesel	63	0.31	4	10	0.09	0.09	2.74	3.7		0.01	0.01	0.31	0.31	9.44	12.74		0.03	0.03
	Skid Steer Loaders	8	Diesel	65	0.37	5	15	0.09	0.09	2.74	3.7		0.01	0.01	0.57	0.57	17.43	23.54		0.06	0.06
	Rubber Tired Dozers	8	Diesel	247	0.40	4	8	0.05	0.05	0.26	2.6		0.01	0.01	0.70	0.70	3.62	36.24		0.14	0.14
	Rubber Tired Loaders	8	Diesel	203	0.36	0	0	0.05	0.05	0.26	2.6		0.01	0.01	0.00	0.00	0.00	0.00		0.00	0.00
	Welders	8	Diesel	46	0.45	2	5	0.09	0.09	2.75	4.1		0.01	0.01	0.16	0.16	5.02	7.48		0.02	0.02
	Trencher	8	Diesel	78	0.50	2	5	0.05	0.05	0.26	3.7		0.01	0.01	0.17	0.17	0.89	12.73		0.03	0.03
	Forklift	8	Diesel	89	0.20	8	16	0.05	0.05	0.26	3.7		0.01	0.01	0.25	0.25	1.31	18.59		0.05	0.05
	Bore/Drill Rig	8	Diesel	221	0.50	2	3	0.05	0.05	0.26	2.6		0.01	0.01	0.29	0.29	1.52	15.20		0.06	0.06
	Grader	8	Diesel	187	0.41	3	7	0.05	0.05	0.26	2.6		0.01	0.01	0.47	0.47	2.46	24.61		0.09	0.09
	Roller	8	Diesel	80	0.38	3	7	0.05	0.05	0.26	3.7		0.01	0.01	0.19	0.19	0.98	13.89		0.04	0.04
	Tractor/Loader/Backhoe	8	Diesel	97	0.37	10	20	0.05	0.05	0.26	3.7		0.01	0.01	0.63	0.63	3.29	46.84		0.13	0.13
	Other Construction Equipment	9	Diesel	48	0.45	30	60	0.09	0.09	2.75	4.1		0.01	0.01	2.31	2.31	70.72	105.43		0.26	0.26
															6.36	**6.36**	**118.22**	**332.65**		**0.97**	**0.97**
Ph 3: Inverters, Substation, Electrical	Skid Steer Loaders	8	Diesel	65	0.37	3	7	0.09	0.09	2.74	3.7		0.01	0.01	0.27	0.27	8.14	10.99		0.03	0.03
	Crane	8	Diesel	231	0.29	2	5	0.05	0.05	0.26	2.6		0.01	0.01	0.30	0.30	1.54	15.36		0.06	0.06
	Aerial Lift	8	Diesel	63	0.31	2	5	0.09	0.09	2.74	3.7		0.01	0.01	0.16	0.16	4.72	6.37		0.02	0.02
	Forklift	8	Diesel	89	0.20	5	12	0.05	0.05	0.26	3.7		0.01	0.01	0.19	0.19	0.98	13.94		0.04	0.04
	Trencher	8	Diesel	78	0.50	3	7	0.05	0.05	0.26	3.7		0.01	0.01	0.24	0.24	1.25	17.82		0.05	0.05
	Welders	8	Diesel	46	0.45	2	5	0.09	0.09	2.75	4.1		0.01	0.01	0.16	0.16	5.02	7.48		0.02	0.02
	Tractor/Loader/Backhoe	8	Diesel	97	0.37	4	10	0.05	0.05	0.26	3.7		0.01	0.01	0.32	0.32	1.65	23.42		0.06	0.06
															1.63	**1.63**	**23.29**	**95.38**		**0.27**	**0.27**
Ph 4: Gen-tie and Loop-in Transmission	Skid Steer Loaders	8	Diesel	65	0.37	1	2	0.09	0.09	2.74	3.7		0.01	0.01	0.08	0.08	2.32	3.14		0.01	0.01
	Crane	8	Diesel	231	0.29	1	2	0.05	0.05	0.26	2.6		0.01	0.01	0.12	0.12	0.61	6.14		0.02	0.02
	Aerial Lift	8	Diesel	63	0.31	3	8	0.09	0.09	2.74	3.7		0.01	0.01	0.25	0.25	7.55	10.20		0.03	0.03
	Welders	10	Diesel	46	0.45	1	2	0.09	0.09	2.75	4.1		0.01	0.01	0.08	0.08	2.51	3.74		0.01	0.01
	Forklift	8	Diesel	89	0.20	2	4	0.05	0.05	0.26	3.7		0.01	0.01	0.06	0.06	0.33	4.65		0.01	0.01
															0.59	**0.59**	**13.33**	**27.87**		**0.08**	**0.08**
Ph 5: Battery Storage (500-1,150 MW)	Skid Steer Loaders	8	Diesel	65	0.37	4	6	0.09	0.09	2.74	3.7		0.01	0.01	0.23	0.23	6.97	9.42		0.03	0.03
	Crane	8	Diesel	231	0.29	2	4	0.05	0.05	0.26	2.6		0.01	0.01	0.24	0.24	1.23	12.29		0.05	0.05
	Aerial Lift	8	Diesel	63	0.31	3	7	0.09	0.09	2.74	3.7		0.01	0.01	0.22	0.22	6.61	8.92		0.02	0.02
	Forklift	8	Diesel	89	0.20	6	7	0.05	0.05	0.26	3.7		0.01	0.01	0.11	0.11	0.57	8.13		0.02	0.02
	Trencher	8	Diesel	78	0.50	2	4	0.05	0.05	0.26	3.7		0.01	0.01	0.14	0.14	0.72	10.18		0.03	0.03
	Welders	10	Diesel	46	0.45	2	4	0.09	0.09	2.75	4.1		0.01	0.01	0.16	0.16	5.02	7.48		0.02	0.02
	Tractor/Loader/Backhoe	8	Diesel	97	0.37	4	6	0.05	0.05	0.26	3.7		0.01	0.01	0.19	0.19	0.99	14.05		0.04	0.04
															1.28	**1.28**	**22.10**	**70.47**		**0.20**	**0.20**

IP Perkins - Construction, Offroad Equipment - Mitigated

Offroad Equipment Use

	CalEEMod Type Offroad Equipment	Hours Per Day	Fuel Type	Rating (hp)	Load Factor	500 MW Quantity	1150 MW Quantity	Mitigated Emission Factors (g/hp-hr)							Mitigated Max Daily Emissions (lbs/day)						
								TOG	ROG	NOX	CO		PM10	PM2.5	TOG	ROG	NOX	CO		PM10	PM2.5
Ph 6: Utility Switchyard (500 kV)	Crane	8	Diesel	231	0.29	1	2	0.05	0.05	0.26	2.6		0.01	0.01	0.12	0.12	0.61	6.14		0.02	0.02
	Aerial Lift	8	Diesel	63	0.31	4	8	0.09	0.09	2.74	3.7		0.01	0.01	0.25	0.25	7.55	10.20		0.03	0.03
	Skid Steer Loaders	8	Diesel	65	0.37	2	4	0.09	0.09	2.74	3.7		0.01	0.01	0.15	0.15	4.65	6.28		0.02	0.02
	Rubber Tired Loaders	8	Diesel	203	0.36	1	1	0.05	0.05	0.26	2.6		0.01	0.01	0.06	0.06	0.34	3.35		0.01	0.01
	Rubber Tired Dozer	8	Diesel	247	0.40	1	1	0.05	0.05	0.26	2.6		0.01	0.01	0.09	0.09	0.45	4.53		0.02	0.02
	Welders	10	Diesel	46	0.45	3	5	0.09	0.09	2.75	4.1		0.01	0.01	0.21	0.21	6.27	9.36		0.02	0.02
	Trencher	8	Diesel	78	0.50	1	2	0.05	0.05	0.26	3.7		0.01	0.01	0.07	0.07	0.36	5.09		0.01	0.01
	Forklift	8	Diesel	89	0.20	2	4	0.05	0.05	0.26	3.7		0.01	0.01	0.06	0.06	0.33	4.65		0.01	0.01
	Bore/Drill Rig	10	Diesel	221	0.50	0	0	0.05	0.05	0.26	2.6		0.01	0.01	0.00	0.00	0.00	0.00		0.00	0.00
	Grader	8	Diesel	187	0.41	0	0	0.05	0.05	0.26	2.6		0.01	0.01	0.00	0.00	0.00	0.00		0.00	0.00
	Roller	8	Diesel	80	0.38	1	2	0.05	0.05	0.26	3.7		0.01	0.01	0.05	0.05	0.28	3.97		0.01	0.01
	Tractor/Loader/Backhoe	8	Diesel	97	0.37	2	3	0.05	0.05	0.26	3.7		0.01	0.01	0.09	0.09	0.49	7.03		0.02	0.02
															1.16	**1.16**	**21.33**	**60.58**		**0.18**	**0.18**

IP Perkins - Construction, Grading Equipment Passes

Construction Phase - Fugitive Dust, per CalEEMod Factors for Grading Equipment Passes

CalEEMod User Guide, Appendix C - 4.4.1 Grading Equipment Passes

Basis: Section 11.9 of USEPA's AP-42 (USEPA 1998b)

EFPM15 = 0.051 × (S)2.0, and EFPM10 = EFPM15 × FPM10

EFTSP = 0.04 × (S)2.5, and EFPM2.5 = EFTSP × FPM2.5

CalEEMod User Guide (2022), Activity Factors: Table G-14. Daily Acres Graded by Equipment Type

Equipment	Acres Graded per 8 Hour Day
Crawler Tractors	0.5
Graders	0.5
Rubber Tired Dozers	0.5
Scrapers	1

Source: South Coast Air Quality Management District Construction Survey.

CalEEMod User Guide (2022), Emission Factors, without mitigation

Where:		PM10	PM2.5
F - scaling factor (AP-42)		0.6	0.031
S (mph)		7.1	7.1
EF (lb/VMT)		1.543	0.167

Dust Control Plan Mitigation % - 84% 84%

VMT = As/Wb × UC1 ÷ UC2

Wb (blade, ft)	12
UC1 (sqft/ac)	43560
UC2 (ft/mile)	5280

	Graders / or / Rubber Tire Dozer (equipment / day)	As (ac/day)	VMT per day	Unmitigated PM10 (lb/day)	Unmitigated PM2.5 (lb/day)	Mitigated PM10 (lb/day)	Mitigated PM2.5 (lb/day)
Ph 1: Site Preparation (~5,800 acres)	25	12.5	8.59375	13.26	2.21	2.12	0.35
Ph 2: PV Panel System (500-1,150 MW)	15	7.5	5.15625	7.95	1.32	1.27	0.21

IP Perkins - Construction, Helicopter Emission Factors and Activity Estimates

Construction Phase - Helicopter Activity during Construction: Add to CalEEMod Results

Basis: Swiss Confederation, FOCA, 2015 (Guidance on the Determination of Helicopter Emissions, Edition 2, Dec 2015, FOCA, CH-3003 Bern)

Criteria Air Pollutant Emission Factors

		Rating (shp/engine)	# engines	LTO Fuel (kg)	LTO HC (g)	LTO NOx (g)	LTO CO (g)	LTO PM (g)	One-hour Fuel (kg)	One-hour HC (kg)	One-hour NOx (kg)	One-hour CO (kg)	One-hour PM (kg)
H500 - Hughes 500 (DDA250-C18)		317	1	16.4	438.2	59.5	571.2	2.3	98.8	0.96	0.48	1.2	0.016

single engine, turboshaft (typ ops) 10 min per LTO (ground idle plus TO or App)

0.0273 LTO avg rate Fuel Use (kg/sec)

5.39 LTO Fuel Use (gal)

0.0274 One-hour Fuel Use (kg/sec)

32.46 One-hour Fuel Use (gal/hr)

Jet fuel A, density std conditions (appx) 804 kg/m3

3.04 kg/gal

0.135 MMBtu/gal

Emissions per LTO

ROG (lb/LTO)	NOx (lb/LTO)	CO (lb/LTO)	PM (lb/LTO)
0.97	0.13	1.26	0.01

Emissions per Hour

ROG (lb/hr)	NOx (lb/hr)	CO (lb/hr)	PM (lb/hr)
2.12	1.06	2.65	0.04

GHG Emission Factors

	CO2 (kg/MMBtu)	CH4 (kg/MMBtu)	N2O (kg/MMBtu)
Factors for: Kerosene-Type Jet Fuel			
US EPA, 40 CFR 98, Subchapter C Table C-1:	72.22	0.003	0.0006
	CO2 (g/gal)	CH4 (g/gal)	N2O (g/gal)
	9749.7	0.405	0.081

Emissions per LTO

CO2e (lb/LTO)	CO2 (lb/LTO)	CH4 (lb/LTO)	N2O (lb/LTO)
116.23	115.82	0.005	0.001

Emissions per Hour

CO2e (lb/hr)	CO2 (lb/hr)	CH4 (lb/hr)	N2O (lb/hr)
700.21	697.76	0.029	0.006

Helicopter Activity Estimates

Helicopter Activity, Phase 3 Peak Day	Activity
Days in phase	150
Helicopters per day	1

		ROG (lbs/day)	NOx (lbs/day)	CO (lbs/day)	PM (lbs/day)	CO2e (MT total)
Overall LTO	300	1.93	0.26	2.52	0.01	15.8
Overall Hours	900	12.70	6.35	15.87	0.21	285.9
Phase 3, Daily:		14.63	6.61	18.39	0.222	301.7

Helicopter Activity, Phase 4 Peak Day	Activity
Days in phase	30
Helicopters per day	1

		ROG (lbs/day)	NOx (lbs/day)	CO (lbs/day)	PM (lbs/day)	CO2e (MT total)
Overall LTO	60	1.93	0.26	2.52	0.01	3.2
Overall Hours	180	12.70	6.35	15.87	0.21	57.2
Phase 4, Daily:		14.63	6.61	18.39	0.222	60.3

	CO2e (MT total)
Total GHG (MT):	362.0

IP Perkins - Construction, GHG related to Water Supply

Construction Phase - Water Use during Construction: Add to CalEEMod Results

Water Energy Intensity Factors: CalEEMod, v. 2022.1.1.3. Table G-32

Construction Water Use : 1,000 acre-feet per entire construction
325.85 million gallons

Hydrologic Region	Supply Water (kWh/million gallons)	Treat Water (kWh/million gallons)	Distribute Water (kWh/million gallons)	Wastewater Treatment (kWh/million gallons)	Sum (kWh/million gallons)
Colorado River Basin	2304	748	166	1519	4,737

CalEEMod (v.2022.1.1.3) for IID: GHG Intensity of Electricity

CO_2 (lb/MWh)	CH_4 (lb/MWh)	N_2O (lb/MWh)
456.54	0.033	0.004

	MWh	CO_2e Factor (MT/MWh)
Construction Water Supply, Electricity Use :	1,544	0.208

	Water Use CO_2e (MT)
Construction Water Supply, GHG Emissions :	321.1

IP Perkins - Operational Activities, Emissions Estimates

Operation Phase - Emissions Summary from CalEEMod Results

Operation includes:
- O&M building at 3,000 sf.
- Water supply of 50 acre-feet annually for panel washing, minimal indoor water uses.
- Standby generator (rated at 45 kW or ~ 61 hp)

Operation Phase - Annual Typical O&M

Operations Emissions by Sector, Annual

	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Category	tons/yr										MT/yr						
Mobile	0.06	0.44	2.30	0.01	0.01	10.10	10.10	0.01	1.14	1.15		958	958	0	0	1	973
Area	0.02	< 0.005	0.01	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005		0	0	< 0.005	< 0.005		0
Energy	0.00	0.00	0.00	0.00	0.00		0.00	0.00		0.00		0	0	0	0		0
Water											0	12	12	0	< 0.005		13
Waste											0	0	0	0	0		1
Refrig.																0	0
Stationary	< 0.005	0.01	0.01	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	0	1	1	< 0.005	< 0.005	0	1
Vegetation												2,205	2,205				2,205
Total	**0.08**	**0.44**	**2.32**	**0.01**	**0.01**	**10.10**	**10.10**	**0.01**	**1.14**	**1.15**	**1**	**3,176**	**3,176**	**0**	**0**	**1**	**3,193**

Operations Emissions by Sector, Maximum Daily (Winter or Summer)

	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T
Category	lb/day									
Mobile	0.43	2.86	21.00	0.07	0.05	65.20	65.20	0.05	7.36	7.41
Area	0.10	0.01	0.13	0.01	0.01	0.00	0.01	0.01	0.00	0.01
Stationary	0.05	0.16	0.18	0.01	0.01	0.00	0.01	0.01	0.00	0.01
Total	**0.58**	**3.03**	**21.31**	**0.08**	**0.07**	**65.20**	**65.22**	**0.07**	**7.36**	**7.43**

IP Perkins - GHG Emissions, Combined Construction and Operations

GHG Summary, Duration of Construction (one-time and Annualized) plus Operation

Construction GHG Emissions by Activity, Summary	Construction One-Time (MTCO2e)	Construction, Total divided by 30 years (MTCO2e per year)
Subtotal Offroad Equipment, Helicopters, Vehicles	8,157	272
Subtotal Onroad Vehicles	8,096	270
Subtotal Construction Water Use	321	11
GHG Emissions, Construction Total (one-time)	**16,574**	
GHG Emissions, Construction Amortized (per year, 30-year life)		**552**

Operations GHG Emissions by Source Type or Activity, Summary	Operation, Annual Emissions (MTCO2e per year)
Operation and Maintenance	988
Effects of Land Use Conversion	2,205
Gas-Insulated Equipment (SF6 Leaks, in CO2e)	982
Emissions Avoided by Producing Electricity	-256,681
GHG Emissions, Operation (per year)	**-252,506**
Total GHG Emissions, Construction Amortized and Operations (per year)	**-251,953**

GHG, Gas-Insulated Equipment

Operations GHG Subtotal, Gas-Insulated Switchgear

SF6 GWP (100-yr basis) per U.S. EPA 40 CFR 98, Subpt.A - Table A-1

22,800

Location	Components	Count ("k")	SF6 Contained per device "k" (lb SF6 / k)	(kg SF6 / k)	(MTCO2e / k)	industry-anticipated leakage (loss / year)	GHG Emisisons, leakage (MTCO2e / year)
Substation	3-ph breaker	9	1500	680	15,510	0.005	698
BAAH	3-ph breaker	3	1500	680	15,510	0.005	233
BAAH	single-phase	2	500	227	5,170	0.005	52
						Total GHG for Gas-Insulated Equipment	**982**

APPENDIX B

CALEEMOD REPORTS

Perkins onroad w-ops v231219 Detailed Report

Table of Contents

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Perkins onroad w-ops v231219
Construction Start Date	1/2/2026
Operational Year	2028
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	3.40
Precipitation (days)	4.80
Location	32.725196893913576, -115.13972167427241
County	Imperial
City	Unincorporated
Air District	Imperial County APCD
Air Basin	Salton Sea
TAZ	5614
EDFZ	19
Electric Utility	Imperial Irrigation District
Gas Utility	Southern California Gas
App Version	2022.1.1.21

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description

General Heavy Industry	8,712	1000sqft	200	0.00	0.00	0.00	—	Substation
General Light Industry	3.00	1000sqft	0.07	3,000	0.00	0.00	—	O&M Building

1.3. User-Selected Emission Reduction Measures by Emissions Sector

Sector	#	Measure Title
Construction	C-2*	Limit Heavy-Duty Diesel Vehicle Idling
Construction	C-10-A	Water Exposed Surfaces
Construction	C-10-C	Water Unpaved Construction Roads

* Qualitative or supporting measure. Emission reductions not included in the mitigated emissions results.

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	8.67	7.41	55.2	208	0.33	0.93	786	787	0.93	84.2	85.1	—	76,718	76,718	1.32	8.21	201	79,400
Mit.	8.67	7.41	55.2	208	0.33	0.93	785	786	0.93	84.1	85.0	—	76,718	76,718	1.32	8.21	201	79,400
% Reduced	—	—	—	—	—	—	< 0.5%	< 0.5%	—	< 0.5%	< 0.5%	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	7.49	6.21	66.2	115	0.40	1.11	786	787	1.11	84.2	85.1	—	74,334	74,334	1.36	9.43	5.21	77,180
Mit.	7.49	6.21	66.2	115	0.40	1.11	785	786	1.11	84.1	85.0	—	74,334	74,334	1.36	9.43	5.21	77,180

% Reduced	—	—	—	—	—	—	< 0.5%	< 0.5%	—	< 0.5%	< 0.5%	—	—	—	—	—	—	—
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	2.90	2.44	21.6	55.1	0.12	0.33	285	285	0.33	30.5	30.9	—	26,682	26,682	0.49	2.91	31.6	27,593
Mit.	2.90	2.44	21.6	55.1	0.12	0.33	285	285	0.33	30.5	30.8	—	26,682	26,682	0.49	2.91	31.6	27,593
% Reduced	—	—	—	—	—	—	< 0.5%	< 0.5%	—	< 0.5%	< 0.5%	—	—	—	—	—	—	—
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.53	0.45	3.95	10.0	0.02	0.06	52.0	52.1	0.06	5.57	5.63	—	4,418	4,418	0.08	0.48	5.23	4,568
Mit.	0.53	0.45	3.95	10.0	0.02	0.06	52.0	52.0	0.06	5.57	5.63	—	4,418	4,418	0.08	0.48	5.23	4,568
% Reduced	—	—	—	—	—	—	< 0.5%	< 0.5%	—	< 0.5%	< 0.5%	—	—	—	—	—	—	—

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	8.67	7.41	55.2	208	0.33	0.93	786	787	0.93	84.2	85.1	—	76,718	76,718	1.32	8.21	201	79,400
2027	5.86	4.92	47.9	128	0.32	0.89	591	591	0.89	63.5	64.3	—	63,520	63,520	0.99	7.59	150	65,958
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	7.49	6.21	61.5	115	0.33	0.93	786	787	0.93	84.2	85.1	—	72,172	72,172	1.36	8.22	5.21	74,660
2027	5.40	4.32	66.2	83.5	0.40	1.11	708	709	1.11	76.1	77.2	—	74,334	74,334	1.21	9.43	4.75	77,180
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

2026	2.90	2.44	21.6	55.1	0.12	0.33	285	285	0.33	30.5	30.9	—	26,682	26,682	0.49	2.91	31.6	27,593
2027	1.52	1.23	18.0	25.1	0.11	0.32	176	176	0.32	18.9	19.2	—	20,493	20,493	0.30	2.65	21.0	21,311
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	0.53	0.45	3.95	10.0	0.02	0.06	52.0	52.1	0.06	5.57	5.63	—	4,418	4,418	0.08	0.48	5.23	4,568
2027	0.28	0.22	3.28	4.58	0.02	0.06	32.0	32.1	0.06	3.46	3.51	—	3,393	3,393	0.05	0.44	3.47	3,528

2.3. Construction Emissions by Year, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	8.67	7.41	55.2	208	0.33	0.93	785	786	0.93	84.1	85.0	—	76,718	76,718	1.32	8.21	201	79,400
2027	5.86	4.92	47.9	128	0.32	0.89	590	590	0.89	63.3	64.2	—	63,520	63,520	0.99	7.59	150	65,958
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	7.49	6.21	61.5	115	0.33	0.93	785	786	0.93	84.1	85.0	—	72,172	72,172	1.36	8.22	5.21	74,660
2027	5.40	4.32	66.2	83.5	0.40	1.11	706	707	1.11	75.9	77.0	—	74,334	74,334	1.21	9.43	4.75	77,180
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	2.90	2.44	21.6	55.1	0.12	0.33	285	285	0.33	30.5	30.8	—	26,682	26,682	0.49	2.91	31.6	27,593
2027	1.52	1.23	18.0	25.1	0.11	0.32	175	175	0.32	18.9	19.2	—	20,493	20,493	0.30	2.65	21.0	21,311
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	0.53	0.45	3.95	10.0	0.02	0.06	52.0	52.0	0.06	5.57	5.63	—	4,418	4,418	0.08	0.48	5.23	4,568
2027	0.28	0.22	3.28	4.58	0.02	0.06	32.0	32.0	0.06	3.45	3.50	—	3,393	3,393	0.05	0.44	3.47	3,528

2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.61	0.57	2.69	21.3	0.07	0.06	65.2	65.2	0.06	7.36	7.42	3.33	20,642	20,646	0.41	0.33	20.5	20,775
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.51	0.49	3.03	11.3	0.06	0.06	65.2	65.2	0.06	7.36	7.42	3.33	19,829	19,832	0.40	0.34	1.29	19,946
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.44	0.43	2.43	12.7	0.06	0.05	55.2	55.2	0.05	6.24	6.28	3.33	19,180	19,184	0.40	0.29	8.08	19,289
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.08	0.08	0.44	2.32	0.01	0.01	10.1	10.1	0.01	1.14	1.15	0.55	3,176	3,176	0.07	0.05	1.34	3,193

2.5. Operations Emissions by Sector, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.53	0.43	2.53	21.0	0.07	0.05	65.2	65.2	0.05	7.36	7.41	—	7,228	7,228	0.07	0.33	19.7	7,347
Area	0.02	0.10	< 0.005	0.13	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.54	0.54	< 0.005	< 0.005	—	0.54
Energy	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Water	—	—	—	—	—	—	—	—	—	—	—	1.33	69.7	71.0	0.14	< 0.005	—	75.7
Waste	—	—	—	—	—	—	—	—	—	—	—	2.00	0.00	2.00	0.20	0.00	—	7.01
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.78	0.78
Stationary	0.05	0.05	0.16	0.18	< 0.005	0.01	0.00	0.01	0.01	0.00	0.01	0.00	25.6	25.6	< 0.005	< 0.005	0.00	25.7

Vegetatio	—	—	—	—	—	—	—	—	—	—	—	—	13,318	13,318	—	—	—	13,318
Total	0.61	0.57	2.69	21.3	0.07	0.06	65.2	65.2	0.06	7.36	7.42	3.33	20,642	20,646	0.41	0.33	20.5	20,775
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.46	0.36	2.86	11.1	0.06	0.05	65.2	65.2	0.05	7.36	7.41	—	6,415	6,415	0.06	0.34	0.51	6,518
Area	—	0.08	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Water	—	—	—	—	—	—	—	—	—	—	—	1.33	69.7	71.0	0.14	< 0.005	—	75.7
Waste	—	—	—	—	—	—	—	—	—	—	—	2.00	0.00	2.00	0.20	0.00	—	7.01
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.78	0.78
Stationary	0.05	0.05	0.16	0.18	< 0.005	0.01	0.00	0.01	0.01	0.00	0.01	0.00	25.6	25.6	< 0.005	< 0.005	0.00	25.7
Vegetation	—	—	—	—	—	—	—	—	—	—	—	—	13,318	13,318	—	—	—	13,318
Total	0.51	0.49	3.03	11.3	0.06	0.06	65.2	65.2	0.06	7.36	7.42	3.33	19,829	19,832	0.40	0.34	1.29	19,946
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.41	0.33	2.39	12.6	0.06	0.05	55.2	55.2	0.04	6.24	6.28	—	5,785	5,785	0.05	0.29	7.30	5,880
Area	0.01	0.09	< 0.005	0.06	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.26	0.26	< 0.005	< 0.005	—	0.27
Energy	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Water	—	—	—	—	—	—	—	—	—	—	—	1.33	69.7	71.0	0.14	< 0.005	—	75.7
Waste	—	—	—	—	—	—	—	—	—	—	—	2.00	0.00	2.00	0.20	0.00	—	7.01
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.78	0.78
Stationary	0.02	0.01	0.04	0.05	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	0.00	7.02	7.02	< 0.005	< 0.005	0.00	7.04
Vegetation	—	—	—	—	—	—	—	—	—	—	—	—	13,318	13,318	—	—	—	13,318
Total	0.44	0.43	2.43	12.7	0.06	0.05	55.2	55.2	0.05	6.24	6.28	3.33	19,180	19,184	0.40	0.29	8.08	19,289
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Mobile	0.08	0.06	0.44	2.30	0.01	0.01	10.1	10.1	0.01	1.14	1.15	—	958	958	0.01	0.05	1.21	973
Area	< 0.005	0.02	< 0.005	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.04	0.04	< 0.005	< 0.005	—	0.04
Energy	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Water	—	—	—	—	—	—	—	—	—	—	—	0.22	11.5	11.8	0.02	< 0.005	—	12.5
Waste	—	—	—	—	—	—	—	—	—	—	—	0.33	0.00	0.33	0.03	0.00	—	1.16
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.13	0.13
Stationary	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	0.00	1.16	1.16	< 0.005	< 0.005	0.00	1.17
Vegetation	—	—	—	—	—	—	—	—	—	—	—	—	2,205	2,205	—	—	—	2,205
Total	0.08	0.08	0.44	2.32	0.01	0.01	10.1	10.1	0.01	1.14	1.15	0.55	3,176	3,176	0.07	0.05	1.34	3,193

2.6. Operations Emissions by Sector, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.53	0.43	2.53	21.0	0.07	0.05	65.2	65.2	0.05	7.36	7.41	—	7,228	7,228	0.07	0.33	19.7	7,347
Area	0.02	0.10	< 0.005	0.13	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.54	0.54	< 0.005	< 0.005	—	0.54
Energy	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Water	—	—	—	—	—	—	—	—	—	—	—	1.33	69.7	71.0	0.14	< 0.005	—	75.7
Waste	—	—	—	—	—	—	—	—	—	—	—	2.00	0.00	2.00	0.20	0.00	—	7.01
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.78	0.78
Stationary	0.05	0.05	0.16	0.18	< 0.005	0.01	0.00	0.01	0.01	0.00	0.01	0.00	25.6	25.6	< 0.005	< 0.005	0.00	25.7
Vegetation	—	—	—	—	—	—	—	—	—	—	—	—	13,318	13,318	—	—	—	13,318
Total	0.61	0.57	2.69	21.3	0.07	0.06	65.2	65.2	0.06	7.36	7.42	3.33	20,642	20,646	0.41	0.33	20.5	20,775

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.46	0.36	2.86	11.1	0.06	0.05	65.2	65.2	0.05	7.36	7.41	—	6,415	6,415	0.06	0.34	0.51	6,518
Area	—	0.08	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Water	—	—	—	—	—	—	—	—	—	—	—	1.33	69.7	71.0	0.14	< 0.005	—	75.7
Waste	—	—	—	—	—	—	—	—	—	—	—	2.00	0.00	2.00	0.20	0.00	—	7.01
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.78	0.78
Stationary	0.05	0.05	0.16	0.18	< 0.005	0.01	0.00	0.01	0.01	0.00	0.01	0.00	25.6	25.6	< 0.005	< 0.005	0.00	25.7
Vegetation	—	—	—	—	—	—	—	—	—	—	—	—	13,318	13,318	—	—	—	13,318
Total	0.51	0.49	3.03	11.3	0.06	0.06	65.2	65.2	0.06	7.36	7.42	3.33	19,829	19,832	0.40	0.34	1.29	19,946
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.41	0.33	2.39	12.6	0.06	0.05	55.2	55.2	0.04	6.24	6.28	—	5,785	5,785	0.05	0.29	7.30	5,880
Area	0.01	0.09	< 0.005	0.06	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.26	0.26	< 0.005	< 0.005	—	0.27
Energy	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Water	—	—	—	—	—	—	—	—	—	—	—	1.33	69.7	71.0	0.14	< 0.005	—	75.7
Waste	—	—	—	—	—	—	—	—	—	—	—	2.00	0.00	2.00	0.20	0.00	—	7.01
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.78	0.78
Stationary	0.02	0.01	0.04	0.05	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	0.00	7.02	7.02	< 0.005	< 0.005	0.00	7.04
Vegetation	—	—	—	—	—	—	—	—	—	—	—	—	13,318	13,318	—	—	—	13,318
Total	0.44	0.43	2.43	12.7	0.06	0.05	55.2	55.2	0.05	6.24	6.28	3.33	19,180	19,184	0.40	0.29	8.08	19,289
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.08	0.06	0.44	2.30	0.01	0.01	10.1	10.1	0.01	1.14	1.15	—	958	958	0.01	0.05	1.21	973
Area	< 0.005	0.02	< 0.005	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.04	0.04	< 0.005	< 0.005	—	0.04

Energy	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Water	—	—	—	—	—	—	—	—	—	—	—	0.22	11.5	11.8	0.02	< 0.005	—	12.5
Waste	—	—	—	—	—	—	—	—	—	—	—	0.33	0.00	0.33	0.03	0.00	—	1.16
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.13	0.13
Stationary	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	0.00	1.16	1.16	< 0.005	< 0.005	0.00	1.17
Vegetation	—	—	—	—	—	—	—	—	—	—	—	—	2,205	2,205	—	—	—	2,205
Total	0.08	0.08	0.44	2.32	0.01	0.01	10.1	10.1	0.01	1.14	1.15	0.55	3,176	3,176	0.07	0.05	1.34	3,193

3. Construction Emissions Details

3.1. Ph 1 Site Preparation (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dust From Material Movement	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.31	0.14	< 0.005	< 0.005	0.70	0.70	< 0.005	0.08	0.08	—	181	181	< 0.005	0.03	0.35	190
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dust From Material Movement	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—

Onsite truck	0.01	0.01	0.33	0.15	< 0.005	< 0.005	0.70	0.70	< 0.005	0.08	0.08	—	182	182	< 0.005	0.03	0.01	190
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dust From Material Movement	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.09	0.04	< 0.005	< 0.005	0.19	0.19	< 0.005	0.02	0.02	—	49.7	49.7	< 0.005	0.01	0.04	52.1
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dust From Material Movement	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	0.03	0.03	< 0.005	< 0.005	< 0.005	—	8.23	8.23	< 0.005	< 0.005	0.01	8.62
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	1.37	1.21	1.82	35.6	0.00	0.00	98.7	98.7	0.00	10.4	10.4	—	5,194	5,194	0.17	0.16	17.2	5,261
Vendor	0.06	0.04	1.67	0.49	0.02	0.03	10.9	10.9	0.03	1.19	1.22	—	2,047	2,047	0.02	0.28	5.32	2,136
Hauling	0.04	0.02	2.18	0.33	0.02	0.05	10.9	11.0	0.05	1.20	1.25	—	2,278	2,278	0.02	0.36	4.88	2,390
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	1.16	1.01	2.11	19.0	0.00	0.00	98.7	98.7	0.00	10.4	10.4	—	4,384	4,384	0.18	0.16	0.44	4,435
Vendor	0.05	0.04	1.86	0.48	0.02	0.03	10.9	10.9	0.03	1.19	1.22	—	2,047	2,047	0.02	0.28	0.14	2,131
Hauling	0.04	0.02	2.41	0.33	0.02	0.05	10.9	11.0	0.05	1.20	1.25	—	2,278	2,278	0.02	0.36	0.13	2,386
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.33	0.29	0.58	6.83	0.00	0.00	26.7	26.7	0.00	2.83	2.83	—	1,292	1,292	0.05	0.04	2.03	1,308

Vendor	0.02	0.01	0.50	0.14	< 0.005	0.01	2.94	2.95	0.01	0.32	0.33	—	561	561	< 0.005	0.08	0.63	584
Hauling	0.01	0.01	0.65	0.09	< 0.005	0.01	2.96	2.97	0.01	0.33	0.34	—	624	624	< 0.005	0.10	0.58	654
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.05	0.10	1.25	0.00	0.00	4.87	4.87	0.00	0.52	0.52	—	214	214	0.01	0.01	0.34	217
Vendor	< 0.005	< 0.005	0.09	0.02	< 0.005	< 0.005	0.54	0.54	< 0.005	0.06	0.06	—	92.8	92.8	< 0.005	0.01	0.10	96.8
Hauling	< 0.005	< 0.005	0.12	0.02	< 0.005	< 0.005	0.54	0.54	< 0.005	0.06	0.06	—	103	103	< 0.005	0.02	0.10	108

3.2. Ph 1 Site Preparation (2026) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dust From Material Movement	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.31	0.14	< 0.005	< 0.005	0.34	0.34	< 0.005	0.04	0.04	—	181	181	< 0.005	0.03	0.35	190
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dust From Material Movement	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.33	0.15	< 0.005	< 0.005	0.34	0.34	< 0.005	0.04	0.04	—	182	182	< 0.005	0.03	0.01	190
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Dust From Material Movement	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.09	0.04	< 0.005	< 0.005	0.09	0.09	< 0.005	0.01	0.01	—	49.7	49.7	< 0.005	0.01	0.04	52.1
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dust From Material Movement	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	< 0.005	—	8.23	8.23	< 0.005	< 0.005	0.01	8.62
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	1.37	1.21	1.82	35.6	0.00	0.00	98.7	98.7	0.00	10.4	10.4	—	5,194	5,194	0.17	0.16	17.2	5,261
Vendor	0.06	0.04	1.67	0.49	0.02	0.03	10.9	10.9	0.03	1.19	1.22	—	2,047	2,047	0.02	0.28	5.32	2,136
Hauling	0.04	0.02	2.18	0.33	0.02	0.05	10.9	11.0	0.05	1.20	1.25	—	2,278	2,278	0.02	0.36	4.88	2,390
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	1.16	1.01	2.11	19.0	0.00	0.00	98.7	98.7	0.00	10.4	10.4	—	4,384	4,384	0.18	0.16	0.44	4,435
Vendor	0.05	0.04	1.86	0.48	0.02	0.03	10.9	10.9	0.03	1.19	1.22	—	2,047	2,047	0.02	0.28	0.14	2,131
Hauling	0.04	0.02	2.41	0.33	0.02	0.05	10.9	11.0	0.05	1.20	1.25	—	2,278	2,278	0.02	0.36	0.13	2,386
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.33	0.29	0.58	6.83	0.00	0.00	26.7	26.7	0.00	2.83	2.83	—	1,292	1,292	0.05	0.04	2.03	1,308
Vendor	0.02	0.01	0.50	0.14	< 0.005	0.01	2.94	2.95	0.01	0.32	0.33	—	561	561	< 0.005	0.08	0.63	584
Hauling	0.01	0.01	0.65	0.09	< 0.005	0.01	2.96	2.97	0.01	0.33	0.34	—	624	624	< 0.005	0.10	0.58	654
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.06	0.05	0.10	1.25	0.00	0.00	4.87	4.87	0.00	0.52	0.52	—	214	214	0.01	0.01	0.34	217
Vendor	< 0.005	< 0.005	0.09	0.02	< 0.005	< 0.005	0.54	0.54	< 0.005	0.06	0.06	—	92.8	92.8	< 0.005	0.01	0.10	96.8
Hauling	< 0.005	< 0.005	0.12	0.02	< 0.005	< 0.005	0.54	0.54	< 0.005	0.06	0.06	—	103	103	< 0.005	0.02	0.10	108

3.3. Ph 2 PV Panel System (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dust From Material Movemen:	—	—	—	—	—	—	0.06	0.06	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.31	0.14	< 0.005	< 0.005	0.70	0.70	< 0.005	0.08	0.08	—	181	181	< 0.005	0.03	0.35	190
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dust From Material Movemen:	—	—	—	—	—	—	0.06	0.06	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.33	0.15	< 0.005	< 0.005	0.70	0.70	< 0.005	0.08	0.08	—	182	182	< 0.005	0.03	0.01	190
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dust From Material Movemen:	—	—	—	—	—	—	0.02	0.02	—	< 0.005	< 0.005	—	—	—	—	—	—	—

Onsite truck	0.01	< 0.005	0.13	0.06	< 0.005	< 0.005	0.28	0.28	< 0.005	0.03	0.03	—	74.6	74.6	< 0.005	0.01	0.06	78.1
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.01	—	12.3	12.3	< 0.005	< 0.005	0.01	12.9
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	3.85	3.41	5.13	100	0.00	0.00	278	278	0.00	29.4	29.4	—	14,608	14,608	0.48	0.44	48.2	14,798
Vendor	0.11	0.08	3.33	0.99	0.03	0.06	21.8	21.8	0.06	2.38	2.44	—	4,094	4,094	0.03	0.56	10.6	4,272
Hauling	0.39	0.22	19.6	2.97	0.14	0.42	98.4	98.8	0.42	10.8	11.3	—	20,500	20,500	0.15	3.22	43.9	21,508
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	3.27	2.83	5.92	53.4	0.00	0.00	278	278	0.00	29.4	29.4	—	12,329	12,329	0.50	0.44	1.25	12,473
Vendor	0.11	0.07	3.71	0.97	0.03	0.06	21.8	21.8	0.06	2.38	2.44	—	4,094	4,094	0.03	0.56	0.28	4,262
Hauling	0.38	0.21	21.7	3.00	0.14	0.42	98.4	98.8	0.42	10.8	11.3	—	20,505	20,505	0.15	3.22	1.14	21,471
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	1.41	1.23	2.43	28.8	0.00	0.00	113	113	0.00	11.9	11.9	—	5,451	5,451	0.20	0.18	8.56	5,518
Vendor	0.05	0.03	1.51	0.41	0.01	0.03	8.83	8.86	0.03	0.97	0.99	—	1,682	1,682	0.01	0.23	1.89	1,753
Hauling	0.16	0.09	8.78	1.23	0.06	0.17	39.9	40.1	0.17	4.40	4.58	—	8,425	8,425	0.06	1.32	7.79	8,829
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.26	0.22	0.44	5.26	0.00	0.00	20.5	20.5	0.00	2.18	2.18	—	902	902	0.03	0.03	1.42	914
Vendor	0.01	0.01	0.28	0.07	< 0.005	< 0.005	1.61	1.62	< 0.005	0.18	0.18	—	279	279	< 0.005	0.04	0.31	290
Hauling	0.03	0.02	1.60	0.22	0.01	0.03	7.29	7.32	0.03	0.80	0.83	—	1,395	1,395	0.01	0.22	1.29	1,462

3.4. Ph 2 PV Panel System (2026) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dust From Material Movement	—	—	—	—	—	—	0.02	0.02	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.31	0.14	< 0.005	< 0.005	0.34	0.34	< 0.005	0.04	0.04	—	181	181	< 0.005	0.03	0.35	190
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dust From Material Movement	—	—	—	—	—	—	0.02	0.02	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.33	0.15	< 0.005	< 0.005	0.34	0.34	< 0.005	0.04	0.04	—	182	182	< 0.005	0.03	0.01	190
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dust From Material Movement	—	—	—	—	—	—	0.01	0.01	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.01	< 0.005	0.13	0.06	< 0.005	< 0.005	0.14	0.14	< 0.005	0.02	0.02	—	74.6	74.6	< 0.005	0.01	0.06	78.1
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	0.02	0.03	< 0.005	< 0.005	< 0.005	—	12.3	12.3	< 0.005	< 0.005	0.01	12.9
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	3.85	3.41	5.13	100	0.00	0.00	278	278	0.00	29.4	29.4	—	14,608	14,608	0.48	0.44	48.2	14,798
Vendor	0.11	0.08	3.33	0.99	0.03	0.06	21.8	21.8	0.06	2.38	2.44	—	4,094	4,094	0.03	0.56	10.6	4,272
Hauling	0.39	0.22	19.6	2.97	0.14	0.42	98.4	98.8	0.42	10.8	11.3	—	20,500	20,500	0.15	3.22	43.9	21,508
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	3.27	2.83	5.92	53.4	0.00	0.00	278	278	0.00	29.4	29.4	—	12,329	12,329	0.50	0.44	1.25	12,473
Vendor	0.11	0.07	3.71	0.97	0.03	0.06	21.8	21.8	0.06	2.38	2.44	—	4,094	4,094	0.03	0.56	0.28	4,262
Hauling	0.38	0.21	21.7	3.00	0.14	0.42	98.4	98.8	0.42	10.8	11.3	—	20,505	20,505	0.15	3.22	1.14	21,471
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	1.41	1.23	2.43	28.8	0.00	0.00	113	113	0.00	11.9	11.9	—	5,451	5,451	0.20	0.18	8.56	5,518
Vendor	0.05	0.03	1.51	0.41	0.01	0.03	8.83	8.86	0.03	0.97	0.99	—	1,682	1,682	0.01	0.23	1.89	1,753
Hauling	0.16	0.09	8.78	1.23	0.06	0.17	39.9	40.1	0.17	4.40	4.58	—	8,425	8,425	0.06	1.32	7.79	8,829
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.26	0.22	0.44	5.26	0.00	0.00	20.5	20.5	0.00	2.18	2.18	—	902	902	0.03	0.03	1.42	914
Vendor	0.01	0.01	0.28	0.07	< 0.005	< 0.005	1.61	1.62	< 0.005	0.18	0.18	—	279	279	< 0.005	0.04	0.31	290
Hauling	0.03	0.02	1.60	0.22	0.01	0.03	7.29	7.32	0.03	0.80	0.83	—	1,395	1,395	0.01	0.22	1.29	1,462

3.5. Ph 3 Inverters, Transformers, Substation, Electrical (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.31	0.14	< 0.005	< 0.005	0.70	0.70	< 0.005	0.08	0.08	—	181	181	< 0.005	0.03	0.35	190
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.33	0.15	< 0.005	< 0.005	0.70	0.70	< 0.005	0.08	0.08	—	182	182	< 0.005	0.03	0.01	190
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.08	0.03	< 0.005	< 0.005	0.16	0.16	< 0.005	0.02	0.02	—	43.0	43.0	< 0.005	0.01	0.04	45.0
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.03	0.03	< 0.005	< 0.005	< 0.005	—	7.11	7.11	< 0.005	< 0.005	0.01	7.45
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	3.85	3.41	5.13	100	0.00	0.00	278	278	0.00	29.4	29.4	—	14,608	14,608	0.48	0.44	48.2	14,798
Vendor	0.06	0.04	1.67	0.49	0.02	0.03	10.9	10.9	0.03	1.19	1.22	—	2,047	2,047	0.02	0.28	5.32	2,136
Hauling	0.39	0.22	19.6	2.97	0.14	0.42	98.4	98.8	0.42	10.8	11.3	—	20,500	20,500	0.15	3.22	43.9	21,508
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	3.27	2.83	5.92	53.4	0.00	0.00	278	278	0.00	29.4	29.4	—	12,329	12,329	0.50	0.44	1.25	12,473
Vendor	0.05	0.04	1.86	0.48	0.02	0.03	10.9	10.9	0.03	1.19	1.22	—	2,047	2,047	0.02	0.28	0.14	2,131

Hauling	0.38	0.21	21.7	3.00	0.14	0.42	98.4	98.8	0.42	10.8	11.3	—	20,505	20,505	0.15	3.22	1.14	21,471
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.81	0.71	1.40	16.6	0.00	0.00	64.9	64.9	0.00	6.87	6.87	—	3,141	3,141	0.12	0.10	4.93	3,179
Vendor	0.01	0.01	0.44	0.12	< 0.005	0.01	2.55	2.55	0.01	0.28	0.29	—	485	485	< 0.005	0.07	0.54	505
Hauling	0.09	0.05	5.06	0.71	0.03	0.10	23.0	23.1	0.10	2.54	2.64	—	4,855	4,855	0.04	0.76	4.49	5,087
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.15	0.13	0.26	3.03	0.00	0.00	11.8	11.8	0.00	1.25	1.25	—	520	520	0.02	0.02	0.82	526
Vendor	< 0.005	< 0.005	0.08	0.02	< 0.005	< 0.005	0.46	0.47	< 0.005	0.05	0.05	—	80.2	80.2	< 0.005	0.01	0.09	83.6
Hauling	0.02	0.01	0.92	0.13	0.01	0.02	4.20	4.22	0.02	0.46	0.48	—	804	804	0.01	0.13	0.74	842

3.6. Ph 3 Inverters, Transformers, Substation, Electrical (2026) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.31	0.14	< 0.005	< 0.005	0.34	0.34	< 0.005	0.04	0.04	—	181	181	< 0.005	0.03	0.35	190
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.33	0.15	< 0.005	< 0.005	0.34	0.34	< 0.005	0.04	0.04	—	182	182	< 0.005	0.03	0.01	190
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.08	0.03	< 0.005	< 0.005	0.08	0.08	< 0.005	0.01	0.01	—	43.0	43.0	< 0.005	0.01	0.04	45.0
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Onsite truck	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	7.11	7.11	< 0.005	< 0.005	0.01	7.45
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	3.85	3.41	5.13	100	0.00	0.00	278	278	0.00	29.4	29.4	—	14,608	14,608	0.48	0.44	48.2	14,798
Vendor	0.06	0.04	1.67	0.49	0.02	0.03	10.9	10.9	0.03	1.19	1.22	—	2,047	2,047	0.02	0.28	5.32	2,136
Hauling	0.39	0.22	19.6	2.97	0.14	0.42	98.4	98.8	0.42	10.8	11.3	—	20,500	20,500	0.15	3.22	43.9	21,508
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	3.27	2.83	5.92	53.4	0.00	0.00	278	278	0.00	29.4	29.4	—	12,329	12,329	0.50	0.44	1.25	12,473
Vendor	0.05	0.04	1.86	0.48	0.02	0.03	10.9	10.9	0.03	1.19	1.22	—	2,047	2,047	0.02	0.28	0.14	2,131
Hauling	0.38	0.21	21.7	3.00	0.14	0.42	98.4	98.8	0.42	10.8	11.3	—	20,505	20,505	0.15	3.22	1.14	21,471
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.81	0.71	1.40	16.6	0.00	0.00	64.9	64.9	0.00	6.87	6.87	—	3,141	3,141	0.12	0.10	4.93	3,179
Vendor	0.01	0.01	0.44	0.12	< 0.005	0.01	2.55	2.55	0.01	0.28	0.29	—	485	485	< 0.005	0.07	0.54	505
Hauling	0.09	0.05	5.06	0.71	0.03	0.10	23.0	23.1	0.10	2.54	2.64	—	4,855	4,855	0.04	0.76	4.49	5,087
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.15	0.13	0.26	3.03	0.00	0.00	11.8	11.8	0.00	1.25	1.25	—	520	520	0.02	0.02	0.82	526
Vendor	< 0.005	< 0.005	0.08	0.02	< 0.005	< 0.005	0.46	0.47	< 0.005	0.05	0.05	—	80.2	80.2	< 0.005	0.01	0.09	83.6
Hauling	0.02	0.01	0.92	0.13	0.01	0.02	4.20	4.22	0.02	0.46	0.48	—	804	804	0.01	0.13	0.74	842

3.7. Ph 3 Inverters, Transformers, Substation, Electrical (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.30	0.14	< 0.005	< 0.005	0.70	0.70	< 0.005	0.08	0.08	—	177	177	< 0.005	0.03	0.32	186
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.33	0.15	< 0.005	< 0.005	0.70	0.70	< 0.005	0.08	0.08	—	178	178	< 0.005	0.03	0.01	186
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.06	0.03	< 0.005	< 0.005	0.12	0.12	< 0.005	0.01	0.01	—	31.9	31.9	< 0.005	0.01	0.03	33.5
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	< 0.005	—	5.29	5.29	< 0.005	< 0.005	< 0.005	5.55
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	3.69	3.26	4.71	90.6	0.00	0.00	278	278	0.00	29.4	29.4	—	14,353	14,353	0.48	0.44	43.9	14,539
Vendor	0.06	0.04	1.57	0.43	0.02	0.03	10.9	10.9	0.03	1.19	1.22	—	2,005	2,005	0.02	0.28	4.63	2,093
Hauling	0.39	0.22	19.1	2.83	0.14	0.42	98.4	98.8	0.42	10.8	11.3	—	20,031	20,031	0.15	3.22	40.7	21,036
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	2.78	2.34	5.51	47.9	0.00	0.00	278	278	0.00	29.4	29.4	—	12,120	12,120	0.50	0.44	1.13	12,263
Vendor	0.04	0.04	1.75	0.42	0.02	0.03	10.9	10.9	0.03	1.19	1.22	—	2,005	2,005	0.02	0.28	0.12	2,089
Hauling	0.37	0.21	21.1	2.87	0.14	0.42	98.4	98.8	0.42	10.8	11.3	—	20,036	20,036	0.15	3.22	1.06	21,001
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.60	0.52	0.92	11.4	0.00	0.00	49.3	49.3	0.00	5.23	5.23	—	2,347	2,347	0.09	0.08	3.41	2,375

Vendor	0.01	0.01	0.31	0.08	< 0.005	0.01	1.94	1.94	0.01	0.21	0.22	—	361	361	< 0.005	0.05	0.36	376
Hauling	0.07	0.04	3.74	0.51	0.03	0.08	17.5	17.6	0.08	1.93	2.00	—	3,607	3,607	0.03	0.58	3.17	3,783
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.11	0.09	0.17	2.07	0.00	0.00	9.00	9.00	0.00	0.95	0.95	—	389	389	0.01	0.01	0.56	393
Vendor	< 0.005	< 0.005	0.06	0.01	< 0.005	< 0.005	0.35	0.35	< 0.005	0.04	0.04	—	59.8	59.8	< 0.005	0.01	0.06	62.3
Hauling	0.01	0.01	0.68	0.09	< 0.005	0.01	3.19	3.21	0.01	0.35	0.37	—	597	597	< 0.005	0.10	0.53	626

3.8. Ph 3 Inverters, Transformers, Substation, Electrical (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.30	0.14	< 0.005	< 0.005	0.34	0.34	< 0.005	0.04	0.04	—	177	177	< 0.005	0.03	0.32	186
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.33	0.15	< 0.005	< 0.005	0.34	0.34	< 0.005	0.04	0.04	—	178	178	< 0.005	0.03	0.01	186
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.06	0.03	< 0.005	< 0.005	0.06	0.06	< 0.005	0.01	0.01	—	31.9	31.9	< 0.005	0.01	0.03	33.5
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	5.29	5.29	< 0.005	< 0.005	< 0.005	5.55
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	3.69	3.26	4.71	90.6	0.00	0.00	278	278	0.00	29.4	29.4	—	14,353	14,353	0.48	0.44	43.9	14,539
Vendor	0.06	0.04	1.57	0.43	0.02	0.03	10.9	10.9	0.03	1.19	1.22	—	2,005	2,005	0.02	0.28	4.63	2,093
Hauling	0.39	0.22	19.1	2.83	0.14	0.42	98.4	98.8	0.42	10.8	11.3	—	20,031	20,031	0.15	3.22	40.7	21,036
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	2.78	2.34	5.51	47.9	0.00	0.00	278	278	0.00	29.4	29.4	—	12,120	12,120	0.50	0.44	1.13	12,263
Vendor	0.04	0.04	1.75	0.42	0.02	0.03	10.9	10.9	0.03	1.19	1.22	—	2,005	2,005	0.02	0.28	0.12	2,089
Hauling	0.37	0.21	21.1	2.87	0.14	0.42	98.4	98.8	0.42	10.8	11.3	—	20,036	20,036	0.15	3.22	1.06	21,001
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.60	0.52	0.92	11.4	0.00	0.00	49.3	49.3	0.00	5.23	5.23	—	2,347	2,347	0.09	0.08	3.41	2,375
Vendor	0.01	0.01	0.31	0.08	< 0.005	0.01	1.94	1.94	0.01	0.21	0.22	—	361	361	< 0.005	0.05	0.36	376
Hauling	0.07	0.04	3.74	0.51	0.03	0.08	17.5	17.6	0.08	1.93	2.00	—	3,607	3,607	0.03	0.58	3.17	3,783
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.11	0.09	0.17	2.07	0.00	0.00	9.00	9.00	0.00	0.95	0.95	—	389	389	0.01	0.01	0.56	393
Vendor	< 0.005	< 0.005	0.06	0.01	< 0.005	< 0.005	0.35	0.35	< 0.005	0.04	0.04	—	59.8	59.8	< 0.005	0.01	0.06	62.3
Hauling	0.01	0.01	0.68	0.09	< 0.005	0.01	3.19	3.21	0.01	0.35	0.37	—	597	597	< 0.005	0.10	0.53	626

3.9. Ph 4 Gen Tie (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.33	0.15	< 0.005	< 0.005	0.70	0.70	< 0.005	0.08	0.08	—	178	178	< 0.005	0.03	0.01	186
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	0.06	0.06	< 0.005	0.01	0.01	—	14.6	14.6	< 0.005	< 0.005	0.01	15.3
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	2.41	2.41	< 0.005	< 0.005	< 0.005	2.53
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.62	0.52	1.22	10.6	0.00	0.00	61.7	61.7	0.00	6.53	6.53	—	2,693	2,693	0.11	0.10	0.25	2,725
Vendor	0.04	0.04	1.75	0.42	0.02	0.03	10.9	10.9	0.03	1.19	1.22	—	2,005	2,005	0.02	0.28	0.12	2,089
Hauling	0.17	0.09	9.39	1.27	0.06	0.19	43.7	43.9	0.19	4.82	5.00	—	8,905	8,905	0.07	1.43	0.47	9,334
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.05	0.09	1.15	0.00	0.00	5.00	5.00	0.00	0.53	0.53	—	238	238	0.01	0.01	0.35	241
Vendor	< 0.005	< 0.005	0.14	0.04	< 0.005	< 0.005	0.88	0.89	< 0.005	0.10	0.10	—	165	165	< 0.005	0.02	0.16	172
Hauling	0.01	0.01	0.76	0.10	0.01	0.02	3.55	3.56	0.02	0.39	0.41	—	732	732	0.01	0.12	0.64	768
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.02	0.21	0.00	0.00	0.91	0.91	0.00	0.10	0.10	—	39.4	39.4	< 0.005	< 0.005	0.06	39.9
Vendor	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	0.16	0.16	< 0.005	0.02	0.02	—	27.3	27.3	< 0.005	< 0.005	0.03	28.5
Hauling	< 0.005	< 0.005	0.14	0.02	< 0.005	< 0.005	0.65	0.65	< 0.005	0.07	0.07	—	121	121	< 0.005	0.02	0.11	127

3.10. Ph 4 Gen Tie (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.33	0.15	< 0.005	< 0.005	0.34	0.34	< 0.005	0.04	0.04	—	178	178	< 0.005	0.03	0.01	186
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	0.03	0.03	< 0.005	< 0.005	< 0.005	—	14.6	14.6	< 0.005	< 0.005	0.01	15.3
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	—	2.41	2.41	< 0.005	< 0.005	< 0.005	2.53
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.62	0.52	1.22	10.6	0.00	0.00	61.7	61.7	0.00	6.53	6.53	—	2,693	2,693	0.11	0.10	0.25	2,725
Vendor	0.04	0.04	1.75	0.42	0.02	0.03	10.9	10.9	0.03	1.19	1.22	—	2,005	2,005	0.02	0.28	0.12	2,089
Hauling	0.17	0.09	9.39	1.27	0.06	0.19	43.7	43.9	0.19	4.82	5.00	—	8,905	8,905	0.07	1.43	0.47	9,334
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.05	0.09	1.15	0.00	0.00	5.00	5.00	0.00	0.53	0.53	—	238	238	0.01	0.01	0.35	241

Vendor	< 0.005	< 0.005	0.14	0.04	< 0.005	< 0.005	0.88	0.89	< 0.005	0.10	0.10	—	165	165	< 0.005	0.02	0.16	172
Hauling	0.01	0.01	0.76	0.10	0.01	0.02	3.55	3.56	0.02	0.39	0.41	—	732	732	0.01	0.12	0.64	768
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.02	0.21	0.00	0.00	0.91	0.91	0.00	0.10	0.10	—	39.4	39.4	< 0.005	< 0.005	0.06	39.9
Vendor	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	0.16	0.16	< 0.005	0.02	0.02	—	27.3	27.3	< 0.005	< 0.005	0.03	28.5
Hauling	< 0.005	< 0.005	0.14	0.02	< 0.005	< 0.005	0.65	0.65	< 0.005	0.07	0.07	—	121	121	< 0.005	0.02	0.11	127

3.11. Ph 5 Battery Storage (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Paving	—	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.30	0.14	< 0.005	< 0.005	0.70	0.70	< 0.005	0.08	0.08	—	177	177	< 0.005	0.03	0.32	186
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Paving	—	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.33	0.15	< 0.005	< 0.005	0.70	0.70	< 0.005	0.08	0.08	—	178	178	< 0.005	0.03	0.01	186
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Paving	—	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.01	< 0.005	0.14	0.06	< 0.005	< 0.005	0.30	0.30	< 0.005	0.03	0.03	—	77.7	77.7	< 0.005	0.01	0.06	81.6
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Paving	—	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Onsite truck	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	0.06	0.06	< 0.005	0.01	0.01	—	12.9	12.9	< 0.005	< 0.005	0.01	13.5
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.82	0.73	1.05	20.1	0.00	0.00	61.7	61.7	0.00	6.53	6.53	—	3,190	3,190	0.11	0.10	9.75	3,231
Vendor	0.06	0.04	1.57	0.43	0.02	0.03	10.9	10.9	0.03	1.19	1.22	—	2,005	2,005	0.02	0.28	4.63	2,093
Hauling	0.17	0.10	8.48	1.26	0.06	0.19	43.7	43.9	0.19	4.82	5.00	—	8,903	8,903	0.07	1.43	18.1	9,349
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.62	0.52	1.22	10.6	0.00	0.00	61.7	61.7	0.00	6.53	6.53	—	2,693	2,693	0.11	0.10	0.25	2,725
Vendor	0.04	0.04	1.75	0.42	0.02	0.03	10.9	10.9	0.03	1.19	1.22	—	2,005	2,005	0.02	0.28	0.12	2,089
Hauling	0.17	0.09	9.39	1.27	0.06	0.19	43.7	43.9	0.19	4.82	5.00	—	8,905	8,905	0.07	1.43	0.47	9,334
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.32	0.28	0.50	6.14	0.00	0.00	26.7	26.7	0.00	2.83	2.83	—	1,270	1,270	0.05	0.04	1.85	1,285
Vendor	0.02	0.02	0.76	0.19	0.01	0.01	4.71	4.72	0.01	0.52	0.53	—	879	879	0.01	0.12	0.88	916
Hauling	0.07	0.04	4.05	0.55	0.03	0.08	18.9	19.0	0.08	2.09	2.17	—	3,903	3,903	0.03	0.63	3.43	4,094
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.05	0.09	1.12	0.00	0.00	4.87	4.87	0.00	0.52	0.52	—	210	210	0.01	0.01	0.31	213
Vendor	< 0.005	< 0.005	0.14	0.03	< 0.005	< 0.005	0.86	0.86	< 0.005	0.09	0.10	—	146	146	< 0.005	0.02	0.15	152
Hauling	0.01	0.01	0.74	0.10	0.01	0.01	3.45	3.47	0.01	0.38	0.40	—	646	646	< 0.005	0.10	0.57	678

3.12. Ph 5 Battery Storage (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Paving	—	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.30	0.14	< 0.005	< 0.005	0.34	0.34	< 0.005	0.04	0.04	—	177	177	< 0.005	0.03	0.32	186
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Paving	—	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.33	0.15	< 0.005	< 0.005	0.34	0.34	< 0.005	0.04	0.04	—	178	178	< 0.005	0.03	0.01	186
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Paving	—	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.01	< 0.005	0.14	0.06	< 0.005	< 0.005	0.15	0.15	< 0.005	0.02	0.02	—	77.7	77.7	< 0.005	0.01	0.06	81.6
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Paving	—	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	0.03	0.03	< 0.005	< 0.005	< 0.005	—	12.9	12.9	< 0.005	< 0.005	0.01	13.5
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.82	0.73	1.05	20.1	0.00	0.00	61.7	61.7	0.00	6.53	6.53	—	3,190	3,190	0.11	0.10	9.75	3,231
Vendor	0.06	0.04	1.57	0.43	0.02	0.03	10.9	10.9	0.03	1.19	1.22	—	2,005	2,005	0.02	0.28	4.63	2,093
Hauling	0.17	0.10	8.48	1.26	0.06	0.19	43.7	43.9	0.19	4.82	5.00	—	8,903	8,903	0.07	1.43	18.1	9,349
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.62	0.52	1.22	10.6	0.00	0.00	61.7	61.7	0.00	6.53	6.53	—	2,693	2,693	0.11	0.10	0.25	2,725

Vendor	0.04	0.04	1.75	0.42	0.02	0.03	10.9	10.9	0.03	1.19	1.22	—	2,005	2,005	0.02	0.28	0.12	2,089
Hauling	0.17	0.09	9.39	1.27	0.06	0.19	43.7	43.9	0.19	4.82	5.00	—	8,905	8,905	0.07	1.43	0.47	9,334
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.32	0.28	0.50	6.14	0.00	0.00	26.7	26.7	0.00	2.83	2.83	—	1,270	1,270	0.05	0.04	1.85	1,285
Vendor	0.02	0.02	0.76	0.19	0.01	0.01	4.71	4.72	0.01	0.52	0.53	—	879	879	0.01	0.12	0.88	916
Hauling	0.07	0.04	4.05	0.55	0.03	0.08	18.9	19.0	0.08	2.09	2.17	—	3,903	3,903	0.03	0.63	3.43	4,094
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.05	0.09	1.12	0.00	0.00	4.87	4.87	0.00	0.52	0.52	—	210	210	0.01	0.01	0.31	213
Vendor	< 0.005	< 0.005	0.14	0.03	< 0.005	< 0.005	0.86	0.86	< 0.005	0.09	0.10	—	146	146	< 0.005	0.02	0.15	152
Hauling	0.01	0.01	0.74	0.10	0.01	0.01	3.45	3.47	0.01	0.38	0.40	—	646	646	< 0.005	0.10	0.57	678

3.13. Ph 6 Utility Switchyard (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.30	0.14	< 0.005	< 0.005	0.70	0.70	< 0.005	0.08	0.08	—	177	177	< 0.005	0.03	0.32	186
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.33	0.15	< 0.005	< 0.005	0.70	0.70	< 0.005	0.08	0.08	—	178	178	< 0.005	0.03	0.01	186
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.17	0.08	< 0.005	< 0.005	0.38	0.38	< 0.005	0.04	0.04	—	97.2	97.2	< 0.005	0.02	0.08	102

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	0.07	0.07	< 0.005	0.01	0.01	—	16.1	16.1	< 0.005	< 0.005	0.01	16.9
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.41	0.36	0.52	10.1	0.00	0.00	30.8	30.8	0.00	3.27	3.27	—	1,595	1,595	0.05	0.05	4.87	1,615
Vendor	0.06	0.04	1.57	0.43	0.02	0.03	10.9	10.9	0.03	1.19	1.22	—	2,005	2,005	0.02	0.28	4.63	2,093
Hauling	0.17	0.10	8.48	1.26	0.06	0.19	43.7	43.9	0.19	4.82	5.00	—	8,903	8,903	0.07	1.43	18.1	9,349
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.31	0.26	0.61	5.32	0.00	0.00	30.8	30.8	0.00	3.27	3.27	—	1,347	1,347	0.06	0.05	0.13	1,363
Vendor	0.04	0.04	1.75	0.42	0.02	0.03	10.9	10.9	0.03	1.19	1.22	—	2,005	2,005	0.02	0.28	0.12	2,089
Hauling	0.17	0.09	9.39	1.27	0.06	0.19	43.7	43.9	0.19	4.82	5.00	—	8,905	8,905	0.07	1.43	0.47	9,334
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.20	0.18	0.31	3.84	0.00	0.00	16.7	16.7	0.00	1.77	1.77	—	794	794	0.03	0.03	1.15	803
Vendor	0.03	0.02	0.95	0.24	0.01	0.02	5.89	5.91	0.02	0.64	0.66	—	1,099	1,099	0.01	0.15	1.10	1,146
Hauling	0.09	0.05	5.06	0.69	0.03	0.10	23.7	23.8	0.10	2.61	2.71	—	4,879	4,879	0.04	0.78	4.29	5,118
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.03	0.06	0.70	0.00	0.00	3.04	3.04	0.00	0.32	0.32	—	131	131	< 0.005	< 0.005	0.19	133
Vendor	0.01	< 0.005	0.17	0.04	< 0.005	< 0.005	1.07	1.08	< 0.005	0.12	0.12	—	182	182	< 0.005	0.03	0.18	190
Hauling	0.02	0.01	0.92	0.13	0.01	0.02	4.32	4.34	0.02	0.48	0.49	—	808	808	0.01	0.13	0.71	847

3.14. Ph 6 Utility Switchyard (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.30	0.14	< 0.005	< 0.005	0.34	0.34	< 0.005	0.04	0.04	—	177	177	< 0.005	0.03	0.32	186
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.33	0.15	< 0.005	< 0.005	0.34	0.34	< 0.005	0.04	0.04	—	178	178	< 0.005	0.03	0.01	186
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.17	0.08	< 0.005	< 0.005	0.18	0.18	< 0.005	0.02	0.02	—	97.2	97.2	< 0.005	0.02	0.08	102
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	0.03	0.03	< 0.005	< 0.005	< 0.005	—	16.1	16.1	< 0.005	< 0.005	0.01	16.9
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.41	0.36	0.52	10.1	0.00	0.00	30.8	30.8	0.00	3.27	3.27	—	1,595	1,595	0.05	0.05	4.87	1,615
Vendor	0.06	0.04	1.57	0.43	0.02	0.03	10.9	10.9	0.03	1.19	1.22	—	2,005	2,005	0.02	0.28	4.63	2,093
Hauling	0.17	0.10	8.48	1.26	0.06	0.19	43.7	43.9	0.19	4.82	5.00	—	8,903	8,903	0.07	1.43	18.1	9,349
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.31	0.26	0.61	5.32	0.00	0.00	30.8	30.8	0.00	3.27	3.27	—	1,347	1,347	0.06	0.05	0.13	1,363
Vendor	0.04	0.04	1.75	0.42	0.02	0.03	10.9	10.9	0.03	1.19	1.22	—	2,005	2,005	0.02	0.28	0.12	2,089
Hauling	0.17	0.09	9.39	1.27	0.06	0.19	43.7	43.9	0.19	4.82	5.00	—	8,905	8,905	0.07	1.43	0.47	9,334
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.20	0.18	0.31	3.84	0.00	0.00	16.7	16.7	0.00	1.77	1.77	—	794	794	0.03	0.03	1.15	803
Vendor	0.03	0.02	0.95	0.24	0.01	0.02	5.89	5.91	0.02	0.64	0.66	—	1,099	1,099	0.01	0.15	1.10	1,146
Hauling	0.09	0.05	5.06	0.69	0.03	0.10	23.7	23.8	0.10	2.61	2.71	—	4,879	4,879	0.04	0.78	4.29	5,118
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.03	0.06	0.70	0.00	0.00	3.04	3.04	0.00	0.32	0.32	—	131	131	< 0.005	< 0.005	0.19	133
Vendor	0.01	< 0.005	0.17	0.04	< 0.005	< 0.005	1.07	1.08	< 0.005	0.12	0.12	—	182	182	< 0.005	0.03	0.18	190
Hauling	0.02	0.01	0.92	0.13	0.01	0.02	4.32	4.34	0.02	0.48	0.49	—	808	808	0.01	0.13	0.71	847

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

Mobile source emissions results are presented in Sections 2.6. No further detailed breakdown of emissions is available.

4.1.2. Mitigated

Mobile source emissions results are presented in Sections 2.5. No further detailed breakdown of emissions is available.

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00

General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00

4.2.2. Electricity Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00

General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Heavy Industry	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00

General Light Industry	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Heavy Industry	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
General Light Industry	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Heavy Industry	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
General Light Industry	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00

4.2.4. Natural Gas Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Heavy Industry	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00

General Light Industry	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Heavy Industry	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
General Light Industry	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Heavy Industry	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
General Light Industry	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00

4.3. Area Emissions by Source

4.3.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Consumer Products	—	0.06	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.02	0.02	< 0.005	0.13	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.54	0.54	< 0.005	< 0.005	—	0.54
Total	0.02	0.10	< 0.005	0.13	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.54	0.54	< 0.005	< 0.005	—	0.54
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	0.06	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	0.08	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.04	0.04	< 0.005	< 0.005	—	0.04
Total	< 0.005	0.02	< 0.005	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.04	0.04	< 0.005	< 0.005	—	0.04

4.3.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	0.06	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.02	0.02	< 0.005	0.13	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.54	0.54	< 0.005	< 0.005	—	0.54
Total	0.02	0.10	< 0.005	0.13	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.54	0.54	< 0.005	< 0.005	—	0.54
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	0.06	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	0.08	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Landscape Equipment	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.04	0.04	< 0.005	< 0.005	—	0.04
Total	< 0.005	0.02	< 0.005	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.04	0.04	< 0.005	< 0.005	—	0.04

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	0.00	65.6	65.6	< 0.005	< 0.005	—	65.9
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	1.33	4.11	5.44	0.14	< 0.005	—	9.83
Total	—	—	—	—	—	—	—	—	—	—	—	1.33	69.7	71.0	0.14	< 0.005	—	75.7
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	0.00	65.6	65.6	< 0.005	< 0.005	—	65.9
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	1.33	4.11	5.44	0.14	< 0.005	—	9.83
Total	—	—	—	—	—	—	—	—	—	—	—	1.33	69.7	71.0	0.14	< 0.005	—	75.7
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	0.00	10.9	10.9	< 0.005	< 0.005	—	10.9
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	0.22	0.68	0.90	0.02	< 0.005	—	1.63
Total	—	—	—	—	—	—	—	—	—	—	—	0.22	11.5	11.8	0.02	< 0.005	—	12.5

4.4.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	0.00	65.6	65.6	< 0.005	< 0.005	—	65.9
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	1.33	4.11	5.44	0.14	< 0.005	—	9.83
Total	—	—	—	—	—	—	—	—	—	—	—	1.33	69.7	71.0	0.14	< 0.005	—	75.7
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	0.00	65.6	65.6	< 0.005	< 0.005	—	65.9
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	1.33	4.11	5.44	0.14	< 0.005	—	9.83
Total	—	—	—	—	—	—	—	—	—	—	—	1.33	69.7	71.0	0.14	< 0.005	—	75.7
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	0.00	10.9	10.9	< 0.005	< 0.005	—	10.9
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	0.22	0.68	0.90	0.02	< 0.005	—	1.63
Total	—	—	—	—	—	—	—	—	—	—	—	0.22	11.5	11.8	0.02	< 0.005	—	12.5

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	2.00	0.00	2.00	0.20	0.00	—	7.01
Total	—	—	—	—	—	—	—	—	—	—	—	2.00	0.00	2.00	0.20	0.00	—	7.01
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	2.00	0.00	2.00	0.20	0.00	—	7.01
Total	—	—	—	—	—	—	—	—	—	—	—	2.00	0.00	2.00	0.20	0.00	—	7.01

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	0.33	0.00	0.33	0.03	0.00	—	1.16
Total	—	—	—	—	—	—	—	—	—	—	—	0.33	0.00	0.33	0.03	0.00	—	1.16

4.5.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	2.00	0.00	2.00	0.20	0.00	—	7.01
Total	—	—	—	—	—	—	—	—	—	—	—	2.00	0.00	2.00	0.20	0.00	—	7.01
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	2.00	0.00	2.00	0.20	0.00	—	7.01
Total	—	—	—	—	—	—	—	—	—	—	—	2.00	0.00	2.00	0.20	0.00	—	7.01
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	0.33	0.00	0.33	0.03	0.00	—	1.16
Total	—	—	—	—	—	—	—	—	—	—	—	0.33	0.00	0.33	0.03	0.00	—	1.16

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.78	0.78
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.78	0.78
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.78	0.78
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.78	0.78
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.13	0.13
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.13	0.13

4.6.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.78	0.78
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.78	0.78
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.78	0.78
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.78	0.78
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.13	0.13
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.13	0.13

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.7.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Emergency Generator	0.05	0.05	0.16	0.18	< 0.005	0.01	0.00	0.01	0.01	0.00	0.01	0.00	25.6	25.6	< 0.005	< 0.005	0.00	25.7
Total	0.05	0.05	0.16	0.18	< 0.005	0.01	0.00	0.01	0.01	0.00	0.01	0.00	25.6	25.6	< 0.005	< 0.005	0.00	25.7
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Emergency Generator	0.05	0.05	0.16	0.18	< 0.005	0.01	0.00	0.01	0.01	0.00	0.01	0.00	25.6	25.6	< 0.005	< 0.005	0.00	25.7
Total	0.05	0.05	0.16	0.18	< 0.005	0.01	0.00	0.01	0.01	0.00	0.01	0.00	25.6	25.6	< 0.005	< 0.005	0.00	25.7
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Emergency Generator	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	0.00	1.16	1.16	< 0.005	< 0.005	0.00	1.17
Total	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	0.00	1.16	1.16	< 0.005	< 0.005	0.00	1.17

4.8.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Emergency	0.05	0.05	0.16	0.18	< 0.005	0.01	0.00	0.01	0.01	0.00	0.01	0.00	25.6	25.6	< 0.005	< 0.005	0.00	25.7
Total	0.05	0.05	0.16	0.18	< 0.005	0.01	0.00	0.01	0.01	0.00	0.01	0.00	25.6	25.6	< 0.005	< 0.005	0.00	25.7
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Emergency Generator	0.05	0.05	0.16	0.18	< 0.005	0.01	0.00	0.01	0.01	0.00	0.01	0.00	25.6	25.6	< 0.005	< 0.005	0.00	25.7
Total	0.05	0.05	0.16	0.18	< 0.005	0.01	0.00	0.01	0.01	0.00	0.01	0.00	25.6	25.6	< 0.005	< 0.005	0.00	25.7
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Emergency Generator	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	0.00	1.16	1.16	< 0.005	< 0.005	0.00	1.17
Total	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	0.00	1.16	1.16	< 0.005	< 0.005	0.00	1.17

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cropland	—	—	—	—	—	—	—	—	—	—	—	—	13,318	13,318	—	—	—	13,318
Total	—	—	—	—	—	—	—	—	—	—	—	—	13,318	13,318	—	—	—	13,318

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cropland	—	—	—	—	—	—	—	—	—	—	—	—	13,318	13,318	—	—	—	13,318
Total	—	—	—	—	—	—	—	—	—	—	—	—	13,318	13,318	—	—	—	13,318
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cropland	—	—	—	—	—	—	—	—	—	—	—	—	2,205	2,205	—	—	—	2,205
Total	—	—	—	—	—	—	—	—	—	—	—	—	2,205	2,205	—	—	—	2,205

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cropland	—	—	—	—	—	—	—	—	—	—	—	—	13,318	13,318	—	—	—	13,318
Total	—	—	—	—	—	—	—	—	—	—	—	—	13,318	13,318	—	—	—	13,318
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cropland	—	—	—	—	—	—	—	—	—	—	—	—	13,318	13,318	—	—	—	13,318
Total	—	—	—	—	—	—	—	—	—	—	—	—	13,318	13,318	—	—	—	13,318
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cropland	—	—	—	—	—	—	—	—	—	—	—	—	2,205	2,205	—	—	—	2,205
Total	—	—	—	—	—	—	—	—	—	—	—	—	2,205	2,205	—	—	—	2,205

4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Ph 1 Site Preparation	Site Preparation	01/2/2026	6/2/2026	5.00	100	—
Ph 2 PV Panel System	Grading	4/2/2026	11/2/2026	5.00	150	—
Ph 3 Inverters, Transformers, Substation, Electrical	Building Construction	9/2/2026	4/2/2027	5.00	150	—
Ph 4 Gen Tie	Building Construction	2/2/2027	3/2/2027	5.00	30.0	—
Ph 5 Battery Storage	Paving	2/2/2027	10/2/2027	5.00	160	—
Ph 6 Utility Switchyard	Trenching	2/2/2027	12/2/2027	5.00	200	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.2.2. Mitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Ph 1 Site Preparation	—	—	—	—
Ph 1 Site Preparation	Worker	160	40.0	LDA,LDT1,LDT2
Ph 1 Site Preparation	Vendor	10.0	70.0	HHDT,MHDT
Ph 1 Site Preparation	Hauling	10.0	70.0	HHDT
Ph 1 Site Preparation	Onsite truck	10.0	5.00	HHDT
Ph 2 PV Panel System	—	—	—	—
Ph 2 PV Panel System	Worker	450	40.0	LDA,LDT1,LDT2
Ph 2 PV Panel System	Vendor	20.0	70.0	HHDT,MHDT
Ph 2 PV Panel System	Hauling	90.0	70.0	HHDT
Ph 2 PV Panel System	Onsite truck	10.0	5.00	HHDT
Ph 3 Inverters, Transformers, Substation, Electrical	—	—	—	—
Ph 3 Inverters, Transformers, Substation, Electrical	Worker	450	40.0	LDA,LDT1,LDT2
Ph 3 Inverters, Transformers, Substation, Electrical	Vendor	10.0	70.0	HHDT,MHDT
Ph 3 Inverters, Transformers, Substation, Electrical	Hauling	90.0	70.0	HHDT
Ph 3 Inverters, Transformers, Substation, Electrical	Onsite truck	10.0	5.00	HHDT

Ph 4 Gen Tie	—	—	—	—
Ph 4 Gen Tie	Worker	100	40.0	LDA,LDT1,LDT2
Ph 4 Gen Tie	Vendor	10.0	70.0	HHDT,MHDT
Ph 4 Gen Tie	Hauling	40.0	70.0	HHDT
Ph 4 Gen Tie	Onsite truck	10.0	5.00	HHDT
Ph 5 Battery Storage	—	—	—	—
Ph 5 Battery Storage	Worker	100	40.0	LDA,LDT1,LDT2
Ph 5 Battery Storage	Vendor	10.0	70.0	HHDT,MHDT
Ph 5 Battery Storage	Hauling	40.0	70.0	HHDT
Ph 5 Battery Storage	Onsite truck	10.0	5.00	HHDT
Ph 6 Utility Switchyard	—	—	—	—
Ph 6 Utility Switchyard	Worker	50.0	40.0	LDA,LDT1,LDT2
Ph 6 Utility Switchyard	Vendor	10.0	70.0	HHDT,MHDT
Ph 6 Utility Switchyard	Hauling	40.0	70.0	HHDT
Ph 6 Utility Switchyard	Onsite truck	10.0	5.00	HHDT

5.3.2. Mitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Ph 1 Site Preparation	—	—	—	—
Ph 1 Site Preparation	Worker	160	40.0	LDA,LDT1,LDT2
Ph 1 Site Preparation	Vendor	10.0	70.0	HHDT,MHDT
Ph 1 Site Preparation	Hauling	10.0	70.0	HHDT
Ph 1 Site Preparation	Onsite truck	10.0	5.00	HHDT
Ph 2 PV Panel System	—	—	—	—
Ph 2 PV Panel System	Worker	450	40.0	LDA,LDT1,LDT2
Ph 2 PV Panel System	Vendor	20.0	70.0	HHDT,MHDT
Ph 2 PV Panel System	Hauling	90.0	70.0	HHDT

Ph 2 PV Panel System	Onsite truck	10.0	5.00	HHDT
Ph 3 Inverters, Transformers, Substation, Electrical	—	—	—	—
Ph 3 Inverters, Transformers, Substation, Electrical	Worker	450	40.0	LDA,LDT1,LDT2
Ph 3 Inverters, Transformers, Substation, Electrical	Vendor	10.0	70.0	HHDT,MHDT
Ph 3 Inverters, Transformers, Substation, Electrical	Hauling	90.0	70.0	HHDT
Ph 3 Inverters, Transformers, Substation, Electrical	Onsite truck	10.0	5.00	HHDT
Ph 4 Gen Tie	—	—	—	—
Ph 4 Gen Tie	Worker	100	40.0	LDA,LDT1,LDT2
Ph 4 Gen Tie	Vendor	10.0	70.0	HHDT,MHDT
Ph 4 Gen Tie	Hauling	40.0	70.0	HHDT
Ph 4 Gen Tie	Onsite truck	10.0	5.00	HHDT
Ph 5 Battery Storage	—	—	—	—
Ph 5 Battery Storage	Worker	100	40.0	LDA,LDT1,LDT2
Ph 5 Battery Storage	Vendor	10.0	70.0	HHDT,MHDT
Ph 5 Battery Storage	Hauling	40.0	70.0	HHDT
Ph 5 Battery Storage	Onsite truck	10.0	5.00	HHDT
Ph 6 Utility Switchyard	—	—	—	—
Ph 6 Utility Switchyard	Worker	50.0	40.0	LDA,LDT1,LDT2
Ph 6 Utility Switchyard	Vendor	10.0	70.0	HHDT,MHDT
Ph 6 Utility Switchyard	Hauling	40.0	70.0	HHDT
Ph 6 Utility Switchyard	Onsite truck	10.0	5.00	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Control Strategies Applied	PM10 Reduction	PM2.5 Reduction
Apply dust suppressants to unpaved roads	84%	84%
Limit vehicle speeds on unpaved roads to 25 mph	44%	44%
Sweep paved roads once per month	9%	9%

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (Cubic Yards)	Material Exported (Cubic Yards)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
Ph 1 Site Preparation	0.00	—	2,900	0.00	—
Ph 2 PV Panel System	113,000	—	2,900	0.00	—
Ph 5 Battery Storage	0.00	0.00	0.00	0.00	0.00

5.6.2. Construction Earthmoving Control Strategies

Non-applicable. No control strategies activated by user.

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
General Heavy Industry	0.00	0%
General Light Industry	0.00	0%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2027	0.00	457	0.03	< 0.005
2026	0.00	457	0.03	< 0.005

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Total all Land Uses	80.0	40.0	40.0	25,029	8,000	4,000	4,000	2,502,857

5.9.2. Mitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Total all Land Uses	80.0	40.0	40.0	25,029	8,000	4,000	4,000	2,502,857

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

5.10.1.2. Mitigated

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
0	0.00	4,500	1,500	—

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	180

5.10.4. Landscape Equipment - Mitigated

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	180

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
General Heavy Industry	0.00	457	0.0330	0.0040	0.00
General Light Industry	0.00	457	0.0330	0.0040	0.00

5.11.2. Mitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
General Heavy Industry	0.00	457	0.0330	0.0040	0.00
General Light Industry	0.00	457	0.0330	0.0040	0.00

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
General Heavy Industry	0.00	16,290,000
General Light Industry	693,750	0.00

5.12.2. Mitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
General Heavy Industry	0.00	16,290,000
General Light Industry	693,750	0.00

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
General Heavy Industry	0.00	—
General Light Industry	3.72	—

5.13.2. Mitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
General Heavy Industry	0.00	—
General Light Industry	3.72	—

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced

General Light Industry	Other commercial A/C and heat pumps	R-410A	2,088	0.30	4.00	4.00	18.0

5.14.2. Mitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
General Light Industry	Other commercial A/C and heat pumps	R-410A	2,088	0.30	4.00	4.00	18.0

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.15.2. Mitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

Equipment Type	Fuel Type	Number per Day	Hours per Day	Hours per Year	Horsepower	Load Factor
Emergency Generator	Diesel	1.00	0.50	50.0	61.0	0.73

5.16.2. Process Boilers

Equipment Type	Fuel Type	Number	Boiler Rating (MMBtu/hr)	Daily Heat Input (MMBtu/day)	Annual Heat Input (MMBtu/yr)

5.17. User Defined

Equipment Type	Fuel Type

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres
Cropland	>70% Sand	6,125	0.00

5.18.1.2. Mitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres
Cropland	>70% Sand	6,125	0.00

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

5.18.2.2. Mitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	28.3	annual days of extreme heat
Extreme Precipitation	0.75	annual days with precipitation above 20 mm
Sea Level Rise	—	meters of inundation depth
Wildfire	0.00	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	2	0	0	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A

Flooding	N/A	N/A	N/A	N/A
Drought	0	0	0	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	N/A	N/A	N/A	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	2	1	1	3
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	1	1	1	2
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	N/A	N/A	N/A	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	35.2
AQ-PM	13.7
AQ-DPM	0.98
Drinking Water	94.8
Lead Risk Housing	11.3
Pesticides	61.3
Toxic Releases	25.4
Traffic	2.58
Effect Indicators	—
CleanUp Sites	84.6
Groundwater	39.4
Haz Waste Facilities/Generators	1.80
Impaired Water Bodies	99.2
Solid Waste	78.3
Sensitive Population	—
Asthma	56.9
Cardio-vascular	67.9
Low Birth Weights	—
Socioeconomic Factor Indicators	—
Education	29.3
Housing	—
Linguistic	12.3
Poverty	71.4

Unemployment	—

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	—
Employed	—
Median HI	—
Education	—
Bachelor's or higher	—
High school enrollment	—
Preschool enrollment	—
Transportation	—
Auto Access	—
Active commuting	—
Social	—
2-parent households	—
Voting	—
Neighborhood	—
Alcohol availability	—
Park access	—
Retail density	—
Supermarket access	—
Tree canopy	—
Housing	—
Homeownership	—

Housing habitability	—
Low-inc homeowner severe housing cost burden	—
Low-inc renter severe housing cost burden	—
Uncrowded housing	—
Health Outcomes	—
Insured adults	—
Arthritis	0.0
Asthma ER Admissions	15.0
High Blood Pressure	0.0
Cancer (excluding skin)	0.0
Asthma	0.0
Coronary Heart Disease	0.0
Chronic Obstructive Pulmonary Disease	0.0
Diagnosed Diabetes	0.0
Life Expectancy at Birth	0.0
Cognitively Disabled	3.3
Physically Disabled	3.3
Heart Attack ER Admissions	40.8
Mental Health Not Good	0.0
Chronic Kidney Disease	0.0
Obesity	0.0
Pedestrian Injuries	0.0
Physical Health Not Good	0.0
Stroke	0.0
Health Risk Behaviors	—
Binge Drinking	0.0
Current Smoker	0.0

No Leisure Time for Physical Activity	0.0
Climate Change Exposures	—
Wildfire Risk	0.0
SLR Inundation Area	0.0
Children	97.4
Elderly	0.3
English Speaking	0.0
Foreign-born	0.0
Outdoor Workers	1.3
Climate Change Adaptive Capacity	—
Impervious Surface Cover	93.0
Traffic Density	0.0
Traffic Access	23.0
Other Indices	—
Hardship	0.0
Other Decision Support	—
2016 Voting	0.0

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	51.0
Healthy Places Index Score for Project Location (b)	—
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	Yes
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Construction: Construction Phases	24-mo schedule per POD v8 circa 11/28/2023
Construction: Trips and VMT	POD v8 Nov 2023, peak workforce w double-occupancy LDA, LDTs, w HHDT for water delivery
Construction: On-Road Fugitive Dust	10 percent unpaved for onsite trucks, with dust suppressants for control
Land Use	Up to 1,150 MW with peak 1000 person construction workforce. 3,000 sq ft O&M building. 200 ac for substation - switchyard - BESS.
Construction: Off-Road Equipment	separate spreadsheet for off-road equipment
Construction: Dust From Material Movement	Import material for Substation, BAAH, and BESS
Construction: Architectural Coatings	no notable construction coatings
Operations: Road Dust	final mile on unpaved
Operations: Water and Waste Water	up to 50 acre-feet or 16.29 million gal annually for panel washing, minimal indoor water use
Operations: Energy Use	no notable onsite use of grid supply electricity or natural gas use
Operations: Refrigerants	O&M building refrigerant
Operations: Fleet Mix	Fleet mix includes 5 pct HHDT - water delivery, panel washing during operation
Operations: Solid Waste	Municipal solid waste stream for O&M building
Operations: Emergency Generators and Fire Pumps	optional backup generator, 45 kW rating

APPENDIX C

AERSCREEN MODEL RESULTS

Summary of AERSCREEN Model Parameters and Assumptions for Criteria Air Pollutant Emissions

AERSCREEN Model Parameters and Assumptions			
Source Type	**Units**	**Value**	**Notes**
Construction Emissions			
PM_{10} Emission Rate	gram/second	1.22579	Total emissions converted to emission rate based on two years of construction
$PM_{2.5}$ Emission Rate	gram/second	0.13550	Total emissions converted to emission rate based on two years of construction
NO_2 Emission Rate	gram/second	0.34919	Total emissions converted to emission rate based on two years of construction
CO Emission Rate	gram/second	1.08819	Total emissions converted to emission rate based on two years of construction
SO_2 Emission Rate	gram/second	0.00178	Total emissions converted to emission rate based on two years of construction
Construction Area Source Parameters			
Long Side of Area Source	meters	5900	Total area equal to 5,985 acre
Short Side of Area Source	meters	4000	Total area equal to 5,985 acre
Release Height	meters	5.0	SMAQMD, 2015
Initial Vertical Dimension	meters	1.4	USEPA, 2022
Operation Emissions			
PM_{10} Emission Rate	gram/second	0.34268	Maximum daily emissions converted to emission rate
$PM_{2.5}$ Emission Rate	gram/second	0.03902	Maximum daily emissions converted to emission rate
NO_2 Emission Rate	gram/second	0.01590	Maximum daily emissions converted to emission rate
CO Emission Rate	gram/second	0.11198	Maximum daily emissions converted to emission rate
SO_2 Emission Rate	gram/second	0.00042	Maximum daily emissions converted to emission rate
Operation Volume Source Parameter			
Initial Lateral Dimension	meters	4	AERMOD Calculator (length of side 17 meters)
Initial Vertical Dimension	meters	1	SMAQMD, 2015
Release Height	meters	5.0	SMAQMD, 2015

Total and maximum daily emissions summarized in Appendix A.

All NOx emissions assumed to be NO_2.

U.S. Environmental Protection Agency (USEPA), 2022. User's Guide for the AMS/EPA Regulatory Model (AERMOD).

Sacramento Metropolitan Air Quality Management District (SMAQMD), 2015. *Guide to Air Quality Assessment in Sacramento County*. June.

Summary of AERSCREEN Results for Criteria Air Pollutant Emissions

The AERSCREEN model results for criteria air pollutant emissions during construction and operation were modeled for the PM_{10} emission rates and then scaled to determined the $PM_{2.5}$, NO_2, CO, and SO_2 concentrations based on the ratio of the corresponding emission rates. All concentrations are reported at the nearest sensitive receptor located approximately 8,100 meters west from the center of the source area.

AERSCREEN Model Results						
Scenario	**Unit**	**1-hr**	**8-hr**	**24-hr**	**Annual**	**Note**
Construction Concentrations [1]						
PM_{10} Concentration	µg/m^3	15.79	15.79	15.79	N/A	
$PM_{2.5}$ Concentration	µg/m^3	1.75	1.75	1.75	N/A	
NO_2 Concentration	ppm	0.002	0.002	0.002	N/A	Conversion factor: 1 µg/m^3 NO_2 = 0.000532 ppm
CO Concentration	ppm	0.01	0.01	0.01	N/A	Conversion factor: 1 µg/m^3 CO = 0.000873 ppm
SO_2 Concentration	ppm	0.00001	0.00001	0.00001	N/A	Conversion factor: 1 µg/m^3 SO_2 = 0.000532 ppm
Operation Concentrations						
PM_{10} Concentration	µg/m^3	7.30	6.57	4.38	0.73	
$PM_{2.5}$ Concentration	µg/m^3	0.83	0.75	0.50	0.08	
NO_2 Concentration	ppm	0.0002	0.0002	0.0001	0.00002	Conversion factor: 1 µg/m^3 NO_2 = 0.000532 ppm
CO Concentration	ppm	0.0021	0.0019	0.0012	0.0002	Conversion factor: 1 µg/m^3 CO = 0.000873 ppm
SO_2 Concentration	ppm	0.000003	0.000003	0.000002	0.0000003	Conversion factor: 1 µg/m^3 SO_2 = 0.000532 ppm

[1] For area sources, the 24-hour average concentrations are equal to the 1-hour average calculated by AERSCREEN.

```
AERSCREEN 21112 / AERMOD 23132                                      05/23/24
                                                                    00:25:53

TITLE: PERKINS RENEWABLE ENERGY PROJECT - CONSTRUCTION - PM10


-----------------------------------------------------------------------------
******************************  AREA PARAMETERS  ****************************
-----------------------------------------------------------------------------

SOURCE EMISSION RATE:            1.2258 g/s                 9.728 lb/hr

AREA EMISSION RATE:           0.519E-07 g/(s-m2)        0.412E-06 lb/(hr-m2)
AREA HEIGHT:                       5.00 meters              16.40 feet
AREA SOURCE LONG SIDE:          5900.00 meters           19356.96 feet
AREA SOURCE SHORT SIDE:         4000.00 meters           13123.36 feet
INITIAL VERTICAL DIMENSION:        1.40 meters               4.59 feet
RURAL OR URBAN:                   RURAL

FLAGPOLE RECEPTOR HEIGHT:          1.50 meters               4.92 feet

INITIAL PROBE DISTANCE =          9000. meters             29528. feet



-----------------------------------------------------------------------------
***********************  BUILDING DOWNWASH PARAMETERS  **********************
-----------------------------------------------------------------------------

               BUILDING DOWNWASH NOT USED FOR NON-POINT SOURCES



-----------------------------------------------------------------------------
**************************  FLOW SECTOR ANALYSIS  ***************************
                 25 meter receptor spacing: 3565. meters - 5000. meters
                 40 meter receptor spacing: 5040. meters - 9000. meters
-----------------------------------------------------------------------------


   MAXIMUM  IMPACT  RECEPTOR

   Zo        SURFACE   1-HR CONC  RADIAL  DIST   TEMPORAL
   SECTOR    ROUGHNESS  (ug/m3)    (deg)   (m)    PERIOD
  -----------------------------------------------------
      1*       0.150     18.62      35  3565.0     WIN
* = worst case diagonal
```

```
-----------------------------------------------------------------------------
*********************  MAKEMET METEOROLOGY PARAMETERS  ********************
-----------------------------------------------------------------------------

MIN/MAX TEMPERATURE:    250.0 / 310.0 (K)

MINIMUM WIND SPEED:       0.5 m/s

ANEMOMETER HEIGHT:     10.000 meters

SURFACE CHARACTERISTICS INPUT: AERMET SEASONAL TABLES

DOMINANT SURFACE PROFILE: Desert Shrubland
DOMINANT CLIMATE TYPE:    Dry Conditions
DOMINANT SEASON:          Winter

ALBEDO:                  0.45
BOWEN RATIO:            10.00
ROUGHNESS LENGTH:       0.150 (meters)

SURFACE FRICTION VELOCITY (U*) ADJUSTED


       METEOROLOGY CONDITIONS USED TO PREDICT OVERALL MAXIMUM IMPACT
       -------------------------------------------------------------

 YR MO DY JDY HR
 -- -- -- --- --
 10 01 06   6 01

    H0     U*     W*  DT/DZ ZICNV ZIMCH  M-O LEN    Z0  BOWEN ALBEDO  REF WS
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 -0.28  0.044 -9.000  0.020 -999.   21.     22.9 0.150  10.00   0.45    0.50

    HT  REF TA     HT
- - - - - - - - - - -
  10.0   250.0    2.0



-----------------------------------------------------------------------------
********************** AERSCREEN AUTOMATED DISTANCES *********************
                OVERALL MAXIMUM CONCENTRATIONS BY DISTANCE
-----------------------------------------------------------------------------


                  MAXIMUM                             MAXIMUM
            DIST     1-HR CONC                  DIST     1-HR CONC
             (m)      (ug/m3)                    (m)      (ug/m3)
```

3565.00	18.62
3575.00	18.59
3600.00	18.45
3625.00	18.41
3650.00	18.17
3674.99	17.84
3700.00	17.55
3725.00	17.28
3750.00	17.49
3775.00	17.22
3800.00	17.00
3825.00	16.76
3850.00	16.53
3875.00	16.45
3900.00	16.45
3925.00	16.44
3950.00	16.43
3975.00	16.43
4000.00	16.42
4025.01	16.41
4050.00	16.41
4074.99	16.40
4100.00	16.39
4125.00	16.39
4150.00	16.38
4175.00	16.37
4200.00	16.37
4225.00	16.36
4250.00	16.35
4275.00	16.35
4300.00	16.34
4325.00	16.33
4350.00	16.33
4375.00	16.32
4400.00	16.31
4425.00	16.31
4450.01	16.30
4475.00	16.30
4499.99	16.29
4525.00	16.28
4550.00	16.28
4575.00	16.27
4600.00	16.27
4625.00	16.26
4650.00	16.26
4675.00	16.26
4700.00	16.26
4725.00	16.26
4750.00	16.25
5880.00	16.13
5920.00	16.12
5960.00	16.11
6000.00	16.11
6040.00	16.10
6080.00	16.10
6120.00	16.09
6160.00	16.09
6200.00	16.08
6240.00	16.08
6280.00	16.07
6320.00	16.06
6360.00	16.06
6400.00	16.05
6440.00	16.05
6480.00	16.04
6520.00	16.03
6560.00	16.03
6600.00	16.02
6640.00	16.02
6680.00	16.01
6720.00	16.00
6760.00	16.00
6800.00	15.99
6840.00	15.99
6880.00	15.98
6920.00	15.97
6960.00	15.97
7000.00	15.96
7040.00	15.96
7080.00	15.95
7120.00	15.94
7160.00	15.94
7200.00	15.93
7240.00	15.92
7280.00	15.92
7320.00	15.91
7360.00	15.91
7400.00	15.90
7440.00	15.89
7480.00	15.89
7520.00	15.88
7560.00	15.87
7600.00	15.87
7640.00	15.86
7680.00	15.85
7720.00	15.85
7760.00	15.84
7800.00	15.84

4775.00	16.25	7840.00	15.83
4800.00	16.25	7880.00	15.82
4825.00	16.25	7920.00	15.82
4850.00	16.24	7960.00	15.81
4875.00	16.24	8000.00	15.80
4900.00	16.24	8040.00	15.80
4925.00	16.24	8080.00	15.79
4950.00	16.24	8120.00	15.78
4975.00	16.23	8160.00	15.78
5000.00	16.23	8200.00	15.77
5040.00	16.23	8240.00	15.77
5080.00	16.22	8280.00	15.76
5120.00	16.22	8320.00	15.75
5160.00	16.21	8360.00	15.75
5200.00	16.21	8400.00	15.74
5240.00	16.21	8440.00	15.73
5280.00	16.20	8480.00	15.73
5320.00	16.20	8520.00	15.72
5360.00	16.19	8560.00	15.71
5400.00	16.19	8600.00	15.71
5440.00	16.18	8640.00	15.70
5480.00	16.18	8680.00	15.69
5520.00	16.17	8720.00	15.69
5560.00	16.17	8760.00	15.68
5600.00	16.16	8800.00	15.67
5640.00	16.16	8840.00	15.67
5680.00	16.15	8880.00	15.66
5720.00	16.15	8920.00	15.66
5760.00	16.14	8960.00	15.65
5800.00	16.14	9000.00	15.64
5840.00	16.13		

********************* AERSCREEN MAXIMUM IMPACT SUMMARY ********************

3-hour, 8-hour, and 24-hour scaled
concentrations are equal to the 1-hour concentration as referenced in
SCREENING PROCEDURES FOR ESTIMATING THE AIR QUALITY
IMPACT OF STATIONARY SOURCES, REVISED (Section 4.5.4)
Report number EPA-454/R-92-019
http://www.epa.gov/scram001/guidance_permit.htm
under Screening Guidance

CALCULATION PROCEDURE	MAXIMUM 1-HOUR CONC (ug/m3)	SCALED 3-HOUR CONC (ug/m3)	SCALED 8-HOUR CONC (ug/m3)	SCALED 24-HOUR CONC (ug/m3)	SCALED ANNUAL CONC (ug/m3)

FLAT TERRAIN	18.62	18.62	18.62	18.62	N/A

DISTANCE FROM SOURCE 3565.00 meters

IMPACT AT THE AMBIENT BOUNDARY	18.62	18.62	18.62	18.62	N/A

DISTANCE FROM SOURCE 3565.00 meters

```
AERSCREEN 21112 / AERMOD 23132                                          05/23/24
                                                                        11:26:40

TITLE: PERKINS RENEWABLE ENERGY PROJECT - OPERATION - PM10


----------------------------------------------------------------------------
****************************  VOLUME PARAMETERS  ****************************
----------------------------------------------------------------------------

SOURCE EMISSION RATE:            0.3427 g/s                2.720 lb/hr
VOLUME HEIGHT:                     5.00 meters             16.40 feet
INITIAL LATERAL DIMENSION:         4.00 meters             13.12 feet
INITIAL VERTICAL DIMENSION:        1.00 meters              3.28 feet
RURAL OR URBAN:                   RURAL

FLAGPOLE RECEPTOR HEIGHT:          1.50 meters              4.92 feet

INITIAL PROBE DISTANCE =          9000. meters            29528. feet



----------------------------------------------------------------------------
***********************  BUILDING DOWNWASH PARAMETERS  *********************
----------------------------------------------------------------------------

               BUILDING DOWNWASH NOT USED FOR NON-POINT SOURCES


**************************  PROBE ANALYSIS  ***************************
                 25 meter receptor spacing: 8100. meters - 5000. meters
                 40 meter receptor spacing: 5040. meters - 9000. meters


     Zo       ROUGHNESS       1-HR CONC   DIST      TEMPORAL
     SECTOR     LENGTH         (ug/m3)     (m)       PERIOD
     ----------------------------------------------------------------------
      1*         0.300         7.295      8100.0      AUT
* = worst case flow sector



----------------------------------------------------------------------------
**********************  MAKEMET METEOROLOGY PARAMETERS  ********************
----------------------------------------------------------------------------

MIN/MAX TEMPERATURE:    250.0 / 310.0 (K)

MINIMUM WIND SPEED:       0.5 m/s
```

ANEMOMETER HEIGHT: 10.000 meters

SURFACE CHARACTERISTICS INPUT: AERMET SEASONAL TABLES

DOMINANT SURFACE PROFILE: Desert Shrubland
DOMINANT CLIMATE TYPE: Dry Conditions
DOMINANT SEASON: Autumn

ALBEDO: 0.28
BOWEN RATIO: 10.00
ROUGHNESS LENGTH: 0.300 (meters)

SURFACE FRICTION VELOCITY (U*) ADJUSTED

METEOROLOGY CONDITIONS USED TO PREDICT OVERALL MAXIMUM IMPACT

YR	MO	DY	JDY	HR
10	01	02	2	12

H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS
0.79	0.068	0.100	0.020	43.	41.	-33.9	0.300	10.00	0.28	0.50

HT	REF TA	HT
10.0	280.0	2.0

METEOROLOGY CONDITIONS USED TO PREDICT AMBIENT BOUNDARY IMPACT

YR	MO	DY	JDY	HR
10	01	02	2	12

H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS
0.79	0.068	0.100	0.020	43.	41.	-33.9	0.300	10.00	0.28	0.50

HT	REF TA	HT
10.0	280.0	2.0

************************ AERSCREEN AUTOMATED DISTANCES **********************

OVERALL MAXIMUM CONCENTRATIONS BY DISTANCE

DIST (m)	MAXIMUM 1-HR CONC (ug/m3)	DIST (m)	MAXIMUM 1-HR CONC (ug/m3)
8100.00	7.295	8560.00	6.943
8120.00	7.279	8600.00	6.914
8160.00	7.247	8640.00	6.885
8200.00	7.216	8680.00	6.856
8240.00	7.184	8720.00	6.828
8280.00	7.153	8760.00	6.800
8320.00	7.123	8800.00	6.772
8360.00	7.092	8840.00	6.744
8400.00	7.062	8880.00	6.716
8440.00	7.032	8920.00	6.689
8480.00	7.002	8960.00	6.662
8520.00	6.972	9000.00	6.635

********************** AERSCREEN MAXIMUM IMPACT SUMMARY *********************

CALCULATION PROCEDURE	MAXIMUM 1-HOUR CONC (ug/m3)	SCALED 3-HOUR CONC (ug/m3)	SCALED 8-HOUR CONC (ug/m3)	SCALED 24-HOUR CONC (ug/m3)	SCALED ANNUAL CONC (ug/m3)
FLAT TERRAIN	7.295	7.295	6.566	4.377	0.7295

DISTANCE FROM SOURCE 8100.00 meters

IMPACT AT THE AMBIENT BOUNDARY	7.295	7.295	6.566	4.377	0.7295

DISTANCE FROM SOURCE 8100.00 meters

APPENDIX D

AVOIDED GREENHOUSE GAS EMISSION CALCULATIONS

Avoided GHG Emissions - Electricity Production

Operation - Emissions Avoided by Producing Electricity

Generation Project - approximate production minus transmission losses

Generation Capacity (MW)	**1,150**
Capacity Factor (est.)	0.204
Transmission Line Loss Factor	7.8%
1,894,799	**MWh/yr**

Basis: production = MW Capacity * Capacity Factor * (1 - Transmission Loss) * 8760 hr/year

DC Capacity Factor estimate from NREL PVWatts calculator: Holtville, CA

BESS Component - discharged, annual estimate

500 MW PV w/BESS	1,150 MW PV w/BESS
(MWh/yr)	**(MWh/yr)**
688,000	1,582,400

GHG Emission Factors - for conventional generation technologies for marginal generation

Notes: Marginal generation is from less efficient (higher emitting) generators in the mix of dispatchable resources.

e.g., avoided emissions from power plants that would turn down to accommodate additional renewable generation. (CPUC 2022)

Estimated CO2 Emission Factors (CEC 2019, Table B-22)			**500 MW PV w/BESS**	**1,150 MW PV w/BESS**
Technology	**Low Case (lbs/MWh)**	**Low Case (MTCO2/MWh)**	**Avoided (MTCO2/yr)**	**Avoided (MTCO2/yr)**
Conventional Combustion Turbines	1,167.70	0.530	364,410	838,142
Advanced Combustion Turbines	1,123.20	0.509	350,522	806,201
Conventional Combined Cycle Technologies	822.5	0.373	256,681	590,367
Conventional Combined Cycle w/Duct Firing	822.5	0.373	256,681	590,367

References:

CEC (California Energy Commission) . 2019. :

Staff Report. Estimated Cost of New Utility-Scale Generation in California: 2018 Update. CEC-200-2019-500. May.

CPUC (California Public Utilities Commission) . 2022. :

Greenhouse Gas and Criteria Pollutant Accounting Methodology for use in Load -Serving Entity Portfolio Development in 2022 Integrated Resource Plans. July.

GHG Emission Factors - for electricity imported from an "unspecified" source for marginal generation

			500 MW PV w/BESS	**1,150 MW PV w/BESS**
Unspecified Resources CO2 Emission Factor		**Unspecified (MTCO2/MWh)**	**Avoided (MTCO2/yr)**	**Avoided (MTCO2/yr)**
Open Market Purchases, western power system GHG		0.428	294,464	677,267

California ARB (Air Resources Board) . Regulation for Mandatory Reporting of GHG Emissions (17 CCR 95111).

California ARB . July 2017. Final Statement of Reasons. Amendments to the Regulation for the Mandatory Reporting of GHG Emissions.

IP Perkins - GHG Balance of Construction Emissions for Year 1

Months to balance one-time Construction emissions - offset by the combined effects of O&M, Land Use Conversion, and Emissions Avoided by Producing Electricity

	Construction (MTCO2e)	Operations (MTCO2e/yr)
Construction Total (one-time)	16,577	
Operation and Maintenance		988
Land Use Conversion		2,205
Gas-Insulated Equipment		982

	Operations	500 MW PV w/BESS	1,150 MW PV w/BESS		500 MW PV w/BESS	1,150 MW PV w/BESS
After Commencing Operation	(MTCO2e/yr)	Avoided (MTCO2/yr)	Avoided (MTCO2/yr)		Construction Balance, Year 1 (MT)	Construction Balance, Year 1 (MT)
Year 1 of Operation	4,175	-256,681	-590,367		-235,929	-569,615
Rolling Months 1 through 12	**(MTCO2e/month)**	**(MTCO2/month)**	**(MTCO2/month)**		**Running Balance**	**Running Balance**
Month 1	348	-21,390	-49,197		-4,465	-32,272
Month 2	348	-21,390	-49,197		-25,507	-81,122
Month 3	348	-21,390	-49,197		-46,550	-129,971
Month 4	348	-21,390	-49,197		-67,592	-178,820
Month 5	348	-21,390	-49,197		-88,634	-227,670
Month 6	348	-21,390	-49,197		-109,676	-276,519
Month 7	348	-21,390	-49,197		-130,718	-325,368
Month 8	348	-21,390	-49,197		-151,760	-374,218
Month 9	348	-21,390	-49,197		-172,803	-423,067
Month 10	348	-21,390	-49,197		-193,845	-471,916
Month 11	348	-21,390	-49,197		-214,887	-520,766
Month 12	348	-21,390	-49,197		-235,929	-569,615
Year 1, Sum of Months 1 through 12	4,175	-256,681	-590,367			

IP Perkins - GHG Balance of Life-of-Project Emissions

Years to balance 30-year Life-of-Project Construction, O&M, Land Use Conversion - offset by Emissions Avoided by Producing Electricity

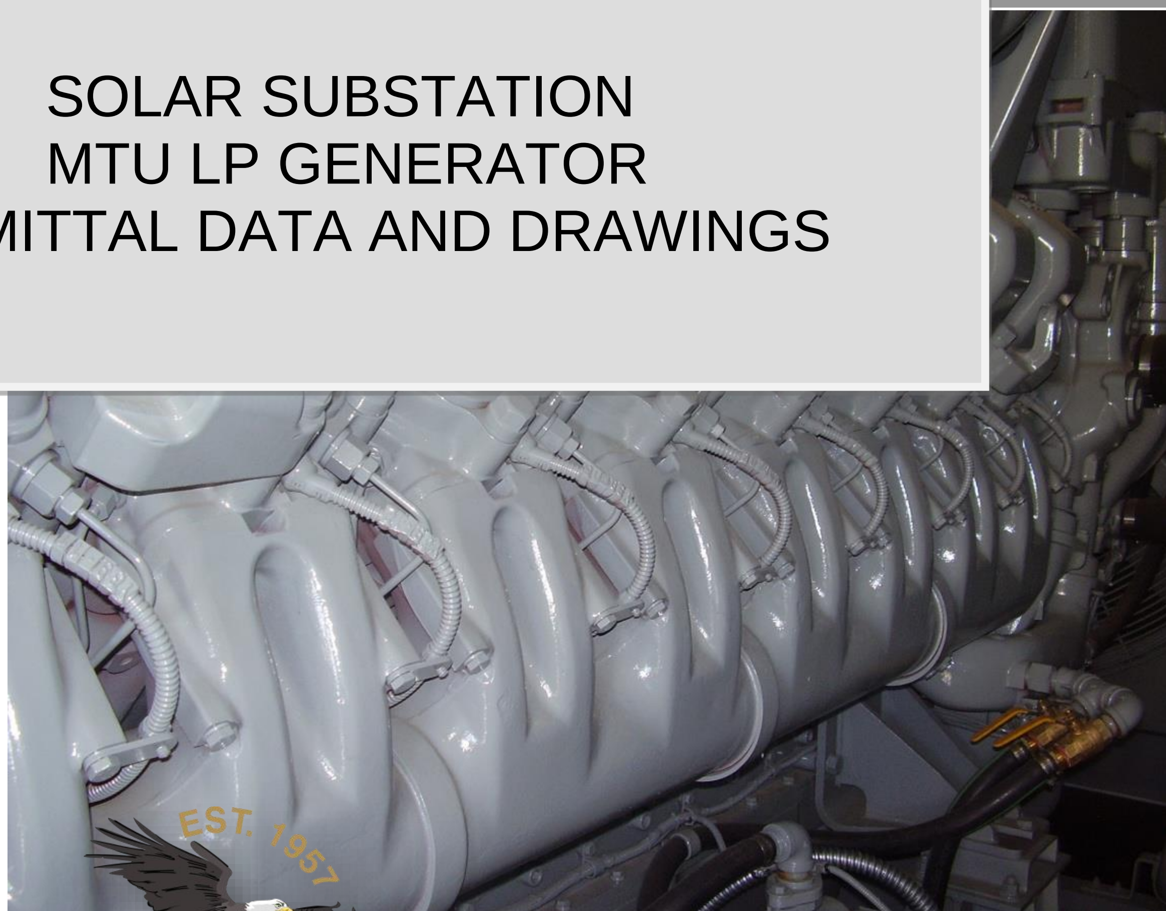
	Construction (MTCO2e)	Operations (MTCO2e/life-of-project)
Construction Total (one-time)	16,577	
Operation and Maintenance		29,640
Land Use Conversion		66,150
Gas-Insulated Equipment		29,469

	500 MW PV w/BESS Avoided (MTCO2)	1,150 MW PV w/BESS Avoided (MTCO2)		500 MW PV w/BESS Project Lifetime Balance (MT)	1,150 MW PV w/BESS Project Lifetime Balance (MT)
After Commencing Operation 30 years Life-of-Project	-7,700,445	-17,711,022		-7,558,608	-17,569,186

Rolling Years 1 through 30	**Avoided (MTCO2/yr)**	**Avoided (MTCO2/yr)**		**Running Balance**	**Running Balance**
Year 1	-256,681	-590,367		-114,845	-448,531
Year 2	-256,681	-590,367		-371,527	-1,038,898
Year 3	-256,681	-590,367		-628,208	-1,629,266
Year 4	-256,681	-590,367		-884,890	-2,219,633
Year 5	-256,681	-590,367		-1,141,571	-2,810,001
Year 6	-256,681	-590,367		-1,398,253	-3,400,368
Year 7	-256,681	-590,367		-1,654,934	-3,990,736
Year 8	-256,681	-590,367		-1,911,615	-4,581,103
Year 9	-256,681	-590,367		-2,168,297	-5,171,470
Year 10	-256,681	-590,367		-2,424,978	-5,761,838
Year 11	-256,681	-590,367		-2,681,660	-6,352,205
Year 12	-256,681	-590,367		-2,938,341	-6,942,573
Year 13	-256,681	-590,367		-3,195,023	-7,532,940
Year 14	-256,681	-590,367		-3,451,704	-8,123,307
Year 15	-256,681	-590,367		-3,708,386	-8,713,675
Year 16	-256,681	-590,367		-3,965,067	-9,304,042
Year 17	-256,681	-590,367		-4,221,749	-9,894,410
Year 18	-256,681	-590,367		-4,478,430	-10,484,777
Year 19	-256,681	-590,367		-4,735,112	-11,075,144
Year 20	-256,681	-590,367		-4,991,793	-11,665,512
Year 21	-256,681	-590,367		-5,248,475	-12,255,879
Year 22	-256,681	-590,367		-5,505,156	-12,846,247
Year 23	-256,681	-590,367		-5,761,838	-13,436,614
Year 24	-256,681	-590,367		-6,018,519	-14,026,982
Year 25	-256,681	-590,367		-6,275,201	-14,617,349
Year 26	-256,681	-590,367		-6,531,882	-15,207,716
Year 27	-256,681	-590,367		-6,788,564	-15,798,084
Year 28	-256,681	-590,367		-7,045,245	-16,388,451
Year 29	-256,681	-590,367		-7,301,927	-16,978,819
Year 30	-256,681	-590,367		-7,558,608	-17,569,186
Life-of-Project, Sum of Years 1 through 30	-7,700,445	-17,711,022			

Attachment A.3 Spec Sheet for Liquified Petroleum Gas Generator (DR AQ-3)

SOLAR SUBSTATION
MTU LP GENERATOR
SUBMITTAL DATA AND DRAWINGS



INTERSTATE
Pride in Service

Provided by:

Interstate Power Systems

12568 Highview Avenue

Lakeville, MN 55044

Power Generation

PERFORMANCE ASSURANCE CERTIFICATION

A Rolls-Royce solution

TESTING PROCEDURES

Prototype

We have been producing superior generator sets for more than six decades. Understanding the importance of reliable, cost-effective products, we have developed industry-leading test procedures to ensure we exceed this criteria. Our testing program confirms that our customers will receive products of the highest quality.

Our Performance Assurance Certification (PAC) certifies that every MTU generator set undergoes rigorous prototype testing including the following:

Prototype Test Procedures

— **Rated Load (NFPA 110)**
All generator set models will produce the nameplate-rated load within the design tolerance of the generator set.

— **Extended-run Testing**
All generator set prototypes have been subjected to extended run-time testing.

— **Transient Response Analysis (ISO 8528-5)**
All new generator set models have undergone transient response analysis per ISO 8528-5.

— **Torsional Analysis**
All generator set models have undergone torsional stress analysis.

— **Engine Cooling System**
All generator set models will cool sufficiently within the ambient design conditions per each model.

— **Anticipatory Alarms and Shutdowns**
The pre-alarms and alarms function appropriately to protect the generator set from any foreseen unnecessary failures.

— **Vibrational Analysis (ISO 8528-9)**
All new generator set models have undergone vibration analysis to ensure that each engine-generator coupling is balanced and that there is no destructive resonant vibration.

— **Noise Analysis (ISO 8528-10)**
All generator sets undergo airborne noise analysis using the enveloping surface method.

Prototype Test Standards

MTU generator sets are compliant with many different codes and standards. Our validation philosophy and performance are regularly reviewed to ensure continuity with these codes and standards: *UL2200, CSA, EPA, NFPA 99—Health Care Facilities, NFPA 70—National Electrical Code, NFPA 110—Standard for Emergency and Standby Power Systems, Department of Labor and Industry, NEMA MG 1—Motors and Generators, and MIL-STD-705-c.*

Factory Acceptance

Our factory testing is performed with the same extreme diligence and attention to detail that is given to the prototype testing process. Every MTU generator set receives a complete factory acceptance test that certifies and ensures the system will function in accordance to every specific application.

Test metering has an accuracy of 1.3% or better. This metering is calibrated a minimum of once per year and is directly traceable to the Bureau of Standards.

Factory acceptance testing procedures

— **Insulation Resistance Inspection** (301.1c)*
— **High Potential Test** (302.1b)*
— **Alternator Overspeed** (1 min.)*
— **Engine Inspection**
— **Generator Inspection**
— **Resistances Inspection** (401.1b)
  — Exciter Field Stator
  — Alternator Armatures
— **Mounting and Coupling Inspection**
— **Engine Fuel Oil System Inspection**
— **Engine Lube Oil System Inspection**
— **Engine Cooling System Inspection**
— **DC Charging System Inspection**
— **Circuit Breaker Inspection**
— **Anticipatory Alarms and Shutdowns Inspection** (505.2b, 515.1b, 515.2b)
— **Optional Equipment Inspection** (513.2a)
— **Load Test Inspection**
  — Full Nameplate-Rated Load
  — No-Load Inspection
  — MAX Load @ 1.0 P.F. (640.1d)
  — MAX Load @ 0.8 P.F.
  — Block Loads @ 0–25%, 0–50%, 0–75%, 0–100%
— **Phase Balance and Sequence Inspection** (507.1d, 508.1d, 516.1a)

** Performed by Alternator OEM*

OPTIONAL TESTING

Factory Acceptance

Extended-run factory acceptance testing

In some cases, extended-run testing may be requested. Unless specified otherwise, extended-run testing will be performed in the following manner:

— Full nameplate-rated load
— Standard readings taken every 15 or 30 minutes

Standard readings recorded during load test inspection

— Run Time
— AC Voltage
— AC Amperage
— kVA
— kWe
— Power Factor
— Frequency
— Exciter Field Voltage
— Exciter Field Current
— Lube Oil Pressure
— Engine Coolant Temperature
— Ambient Temperature

Witnessed factory acceptance testing

Witnessed factory tests must be scheduled and approved at least four weeks prior to the generator set's scheduled shipping date. Any requests for witnessed factory testing after this four-week period must be approved by the Regional Sales Manager and are subject to additional fees.

Witnessed extended-run factory acceptance testing

Witnessed extended-run tests must be scheduled and approved at least four weeks prior to the generator set's scheduled ship date. Any requests for witnessed extended-run testing after this four-week period must be approved by the Regional Sales Manager and are subject to additional fees.

Additional factory acceptance testing

Additional testing is available upon request. The following is a list of supplementary tests which can be performed on MTU generator sets. Non-standard testing is subject to additional charges.

Additional testing procedures

— **Start and Stop Test** (MIL-STD-705c 503.1c)
— **Remote Start and Stop Test** (MIL-STD-705c 503.2c)
— **Overspeed Protective Device Test** (MIL-STD-705c 505.2b)
— **Insulation Resistance Test** (MIL-STD-705c 301.1c)*
— **Open Circuit Saturation Curve Test** (MIL-STD-705c 410.1b)
— **Temperature Rise Test** (MIL-STD-705c 680.1c)
— **Frequency Range Adjust Test** (MIL-STD-705c 511.2c)
— **Low Oil Pressure Protective Device Test** (MIL-STD-705c 515.1b)
— **Over-temperature Protective Device Test** (MIL-STD-705c 515.2b)
— **Controls, Direction, and Rotation Test** (MIL-STD-705c 516.1a)
— **Frequency and Voltage Regulation, Stability, and Transient Response** (MIL-STD-705c 608.1b)
— **Voltage and Frequency Regulation** (MIL-STD-705c 614.1b)
— **Voltage Dip and Rise for Rated Load Test** (MIL-STD-705c 619.2c)
— **Regulator Range Test** (511.1d)
— **Maximum Power Test** (MIL-STD-705c 640.1d)
— **Fuel Consumption Test**
— **Vibration and Mechanical Balance Test** (ISO 8528-9)
— **Sound Test** (ISO 8528-10)

** Testing conducted by generator OEM*

Subject to change. | Edition 02/20 | ENC 2020-02

Rolls-Royce Group
www.mtu-solutions.com

CERTIFICATE OF COMPLIANCE

Certificate Number	AU3559
Report Reference	AU3559-20110603
Issue Date	2020-JULY-13

Issued to:	MTU America Inc 100 Power Dr Mankato MN 56001-4790
This certificate confirms that representative samples of	ENGINE GENERATORS See Addendum Page
	Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.
Standard(s) for Safety:	UL 2200, Stationary Engine Generator Assemblies
Additional Information:	See the UL Online Certifications Directory at https://iq.ulprospector.com for additional information.

This *Certificate of Compliance* does not provide authorization to apply the UL Mark. Only the UL Follow-Up Services Procedure provides authorization to apply the UL Mark.

Only those products bearing the UL Mark should be considered as being UL Certified and covered under UL's Follow-Up Services.

Look for the UL Certification Mark on the product.

Bruce Mahrenholz, Director North American Certification Program

UL LLC

CERTIFICATE OF COMPLIANCE

Certificate Number AU3559
Report Reference AU3559-20110603
Issue Date 2020-JULY-13

This is to certify that representative samples of the product as specified on this certificate were tested according to the current UL requirements.

Stationary engine generator assemblies for outdoor use and indoor use, Models:

Model Series G, followed by S or P, may be followed by two zeroes, followed by 130, 150, 175, 200, 235, 260, 300, 350, 355 or 400, followed by N, L, or V, followed by 6, followed by C or S, followed by R, P, J, N, G or D, followed by A, followed by S, followed by 0, followed by 98, followed by 3 or 4. May have additional prefix or suffix letters or numbers.

Models G, followed by G, followed by 06, 08, 10, or 12, followed by R or V, followed by K, followed by a three digit number. May have additional prefix or suffix letters or numbers.

Models 6, 8, 10, or 12, followed by R or V, followed by a four digit number, followed by G, followed by S, followed by a number ranging from 150 to 650. May have additional prefix or suffix letters or numbers.

Bruce Mahrenholz, Director North American Certification Program

UL LLC

Prototype Test Summary (PTS)

A Rolls-Royce solution

Prototype testing is administered to validate the electrical and mechanical design integrity of the generator set. The results indicated below summarize testing performed on the prototype of the specified generator set model. This form of testing is only conducted on standard factory prototype generator sets. *Results may vary.*

GENERATOR SET MODEL(S):	***mtu*** 8V0110 GS150

Rep. Prototype Model:	***mtu*** 8V0110 GS150	**Test Date:**	10/20/2020
kW:	150	**kVA:**	240
Voltage:	240	**Hz:**	60

ENGINE/GENERATOR

Engine Manufacturer:	PSI	**Engine Model:**	PSI 8.8L T CAC
Engine Fuel:	Natural Gas		
Generator Manufacturer:	Marathon	**Generator Model:**	431CSL6208
Voltage Regulator Model:	SE350	**PMG Equipped:**	☐ Yes ☒ No

OPTIONS

Enclosure Level:	Level 3	**Silencer:**	Unit Mounted – L3 system
Air Filtration:	Standard		

TEST SUMMARY

TEST	TEST RESULT
Transient Performance *Certifies that the engine generator-set model has undergone transient response analysis per ISO 8528-5*	**NFPA-110 One Step:** ☒ 100% ☐ Other. Specify: ____ % **Full Load Acceptance:** Voltage Dip: 42.1 % Recovery Time: 3.37 seconds Frequency Dip: 14.4 % Recovery Time: 3.69 seconds
Steady State Performance *Certifies that voltage deviation and harmonics are within acceptance tolerance range per ISO-8528-5 at full load*	**Frequency Regulation:** 0.22 +/- % Regulation Overall 60.27 Maximum Hz 60.01 Minimum Hz **Voltage Regulation:** 0.26 +/- % Regulation Overall 242.7 Maximum AC Volts 241.5 Minimum AC Volts
Torsional Analysis *Certifies that the generator set has undergone torsional stress analysis and is not subjected to torsional stresses that could be harmful to the unit*	☒ Complete
Cooling System *Certifies that all generator set models will cool sufficiently within the ambient design conditions per each model at referenced enclosure level*	48 °C (118.4 °F) Maximum Ambient Temperature 191 m^3/min (6.738 SCFM) Radiator Air Flow
Sound Data *Certifies that sound data is within the acceptable tolerance range per ISO 8528-10 at referenced enclosure level*	74.5 dBA @ 7 m (23 ft) at full rated load *The sound value is representative of the specified prototype at the time of testing and is subject to alteration due to technological advances. Please contact your **mtu** representative for the most recent enclosure and sound data.*
Vibrational Analysis *Certifies that new generator set models have undergone vibration analysis to ensure that each generator coupling is balanced and there is no destructive resonant vibration per ISO 8528-9*	☒ Complete

Subject to change. 2021-10

ROLLS-ROYCE SOLUTIONS AMERICA INC.

Two (2) Year / 3,000 Hour Basic Limited Warranty
Standby (3D) / Prime (3B) / Data Center Continuous Power (3F)

Rolls-Royce Solutions America Inc. ("RRSA") issues the following express Limited Warranty subject to the following terms, conditions, and limitations:

An original consumer ("Owner") who purchases an RRSA engine generator set ("Product") is entitled to coverage under this Limited Warranty. RRSA warrants to the Owner that the Product is free of defects in material and workmanship and will perform under normal use and service from valid start-up performed by RRSA. Any nonconformity to the foregoing is defined as a Warrantable Defect. This Limited Warranty applies to Product shipped by RRSA after January 1, 2014.

1. Disclaimers

LIMITATION OF WARRANTIES: THIS LIMITED WARRANTY IS GIVEN EXPRESSLY AND IN PLACE OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE, FREEDOM FROM INFRINGEMENT OR THIRD PARTY INTELLECTUAL PROPERTY RIGHTS, OR ARISING FROM COURSE OF DEALING, COURSE OF PERFORMANCE OR USAGE OF TRADE. THERE ARE NO UNDERSTANDINGS, AGREEMENTS, REPRESENTATIONS, OR WARRANTIES NOT SPECIFIED HEREIN.

THIS LIMITED WARRANTY, THE OBLIGATIONS OF RRSA AND THE RIGHTS AND REMEDIES OF THE OWNER SET FORTH IN THIS LIMITED WARRANTY ARE EXCLUSIVE AND ARE EXPRESSLY IN LIEU OF, AND THE OWNER HEREBY WAIVES AND RELEASES ALL OTHER OBLIGATIONS, WARRANTIES (INCLUDING WARRANTY AGAINST REDHIBITORY DEFECTS), REPRESENTATIONS OR LIABILITIES, EXPRESS OR IMPLIED, ARISING BY LAW IN CONTRACT, TORT (INCLUDING NEGLIGENCE OR STRICT LIABILITY) OR OTHERWISE, INCLUDING BUT NOT LIMITED TO ANY CLAIMS ARISING OUT OF, CONNECTED WITH OR RESULTING FROM THE PERFORMANCE OF THIS LIMITED WARRANTY OR FROM THE DESIGN, MANUFACTURE, SALE, REPAIR, LEASE OR USE OF THE PRODUCT, ANY COMPONENT THEREOF AND SERVICES DELIVERED OR RENDERED HEREUNDER OR OTHERWISE.

IN NO EVENT, WHETHER AS A RESULT OF BREACH OF CONTRACT OR WARRANTY, ALLEGED NEGLIGENCE, OR OTHERWISE, SHALL RRSA BE SUBJECT TO LIABILITY FOR INCIDENTAL, CONSEQUENTIAL, INDIRECT, SPECIAL OR PUNITIVE DAMAGES OF ANY KIND, INCLUDING WITHOUT LIMITATION, DAMAGE TO THE PRODUCT, OR OTHER PROPERTY, COMMERCIAL LOSSES, LOST PROFITS, LOSS OF USE, INCONVENIENCE, LOSS OF TIME, COST OF CAPITAL, COST OF SUBSTITUTE EQUIPMENT, DOWNTIME, OR CLAIMS OF CUSTOMERS.

RRSA'S AGGREGATE TOTAL LIABILITY RELATING TO THE SYSTEM AND/OR PRODUCT UNDER THIS LIMITED WARRANTY OR UNDER ANY OTHER CLAIM (IN CONTRACT, TORT, OR OTHERWISE) MADE IN CONNECTION WITH THE SALE OR USAGE OF THE SYSTEM AND/OR PRODUCT IS LIMITED TO THE DOLLAR AMOUNT OF THE OWNER'S ORIGINAL PAYMENT MADE FOR THE SYSTEM AND/OR PRODUCT.

2. Limited Warranty Periods

Limited Warranty Period. The Limited Warranty Period for a Warrantable Defect in the Product is twenty-four (24) months after the first commissioning of the Product. In all cases, the Limited Warranty period will expire not later than thirty-six (36) months from the date of shipment from the RRSA Mankato, MN facility or after 3,000 operation hours, whichever occurs first.

Accessories Coverage Period. The Accessories Coverage Period for a Warrantable Defect in cords, receptacles, cord reels, gas flex pipes, housing lights, space heaters, and associated equipment ("Accessories") is twelve (12) months from the date of shipment from RRSA Mankato, MN facility.

RRSA warranty obligations under this Limited Warranty are contingent upon distributor completing the following:

(a) The RRSA warranty and the *Start-Up Validation and Pre-Inspection Form*. Return both to RRSA within sixty (60) days of the start-up date; and
(b) The engine registration form (when applicable). Return to the manufacturer as stated in the engine registration form instructions.

3. RRSA Responsibilities

If a Warrantable Defect is found during the Limited Warranty Period and/or the Accessories Coverage Period, and provided the Owner has complied with its obligations under Section 4, RRSA will, during normal working hours, through an RRSA authorized distributor, dealer, or service outlet, perform some or all of the following:

(a) Repair or replace, at the sole election of RRSA, the defective part with a new or remanufactured replacement part;
(b) Provide reasonable or customary labor needed to correct the Warrantable Defect;
(c) Provide technician travel time of 400 miles to and from the closest RRSA authorized distributor, dealer, or service outlet to the Product location;
(d) Part removal and re-installation, if necessary and as solely determined by RRSA.

The obligation to repair or replace defective parts by RRSA does not include responsibility for reimbursement of incidental or consequential costs. If RRSA repairs or replaces an Accessory, part, or Product under this Limited Warranty, the repaired or replaced Accessory, part, or Product assumes the unexpired portion of the warranty period remaining from the original Accessory, part, or Product. Repair or replacement of an Accessory, part, or Product will not extend the term of the original Limited Warranty Period or Accessories Coverage Period. Parts or Product replaced shall become the property of RRSA.

Failure of RRSA to enforce any of the terms or conditions stated herein shall not be construed as a waiver of such provision or of any other terms and conditions of this Limited Warranty.

4. Owner Responsibilities

During the Limited Warranty Period and Accessories Coverage Period, the Owner is responsible for, and RRSA will not reimburse for the following:

(a) Battery;
(b) Premium or overtime labor costs;
(c) Labor and material costs for Product removal and reinstallation;
(d) Any special access fees required to gain access to RRSA equipment, without limitation, training or safety policy requirement to gain access;
(e) Transportation costs or travel expenses related to delivery of the Product to the designated distributor, dealer, or service outlet;
(f) Incidental and consequential costs, damages, or administrative expenses of whatever nature;
(g) Non-Product repairs, vehicle damage, “downtime” expenses, cargo damage, fines, lost income, any business costs of any kind, Owner’s travel expenses, and other losses resulting from a Warrantable Defect;
(h) Shipping charges for replacement parts/Products in excess of those which are usual and customary; or
(i) Local taxes, if applicable.

In addition, Owner must:

(a) Operate, use, and maintain the Product in accordance with the applicable Owner’s manual and/or any other manuals specified by RRSA, including without limitation handling, inspection, servicing, or operating instructions;

(b) Promptly notify RRSA or its authorized representative of a Warrantable Defect and make the Product available for repair;
(c) Comply with RRSA or its authorized representative's reasonable directions regarding the timing, sequence, and location of warranty repairs and make the Product available for inspection;
(d) Perform all required maintenance and maintain and provide proof that all required maintenance has been performed;
(e) Use RRSA specified parts, components, and consumables;
(f) Promptly return to RRSA all parts replaced under this Limited Warranty;
(g) Comply with RRSA long term storage guidelines, if applicable, and maintain and provide proof of compliance;
(h) Routinely exercise the Product in accordance with operating instructions;
(i) Install the Product in accordance with the installation guide provided; and
(j) Reimburse RRSA for all costs incurred in providing warranty service where, following examination, the request or claim for warranty coverage proves to be unfounded or excluded, as well as all incidental costs including those incurred investigating the claim.

5. Limitations

RRSA is not responsible, and this Limited Warranty is not available under any circumstances, for any of the following:

(a) Failure of Owner to fulfill its obligations under Section 4;
(b) Failure of Owner to follow RRSA instructions for Product stored by Owner longer than 180 days from date of shipment from the RRSA Mankato, MN facility;
(c) Defects caused by adjustments made by Owner to the fuel system or governor system;
(d) Defects which were obvious or capable of being identified by reasonable inspection and were not reported to RRSA within a reasonable time;
(e) Rental equipment used during warranty work;
(f) Defects caused or potentially caused by service work performed by non-RRSA authorized service providers and/or the use of non-genuine RRSA parts;
(g) Defects resulting from natural wear and tear, external action, negligence, natural disasters, accidents, incorrect use, improper handling or storage, inadequate corrosion-proofing, incorrect assembly or installation, or modification of the Product;
(h) Defects resulting from abuse or neglect, including unauthorized modifications to the Product;
(i) Repair or any use or installation which RRSA, in its sole discretion, determines to be improper;
(j) Defects caused by incorrect maintenance;
(k) Defects resulting from Owner's delay in making the Product available after being notified of a potential problem or Owner's failure to take immediate measures to avoid or mitigate damage;
(l) Damage caused by shipping;
(m) Repair of parts sold by RRSA that are warranted directly to the Owner by the respective part's manufacturer;
(n) Misapplication of the Product;
(o) Diesel engine "wet stacking" due to lightly loaded diesel engines;
(p) Acts of nature or acts of God;
(q) Any failure, other than those resulting from a defect in material or factory workmanship of the Product;
(r) Use of the Product for purposes other than those for which it was intended, including without limitation use of the Product under extraordinary operating conditions not made known to RRSA in writing at the time of the order; or
(s) Material provided by or a design specified by the Owner.

6. Software Warranty. Where software is included in the Product, RRSA warrants to the Owner that 1) the software will be substantially free from material program errors and material defects in material and workmanship, and that 2) it shall function substantially in accordance with RRSA specification at the time of dispatch from the RRSA manufacturing facility. RRSA does not warrant that the software is error-free or free from “bugs” as commonly categorized by the computer industry. RRSA shall, during the Limited Warranty Period, endeavor to remedy at its cost, in its sole discretion, by repair or replacement of any material program errors or material defects of which Owner has promptly notified RRSA. RRSA, at its option, may elect to provide the most current software at no cost, and in such case RRSA will not cover the cost to install the applicable updated software. RRSA shall have no obligation with respect to any nonconformities resulting from unauthorized modifications to the software or any Owner interfacing.

7. **Emissions Warranty.** The Product may be covered under an emissions warranty specified by the U.S. Environmental Protection Agency and/or the California Air Resources Board. The terms of the warranty, if applicable, may be accessed by following the link: https://www.mtu-solutions.com/eu/en/technical-information/emissions-warranty.html. Any such Emissions Warranty is incorporated herein by reference in its entirety to the extent and with the same force as if fully set forth herein. The Product, if certified, may only be certified to comply with the required country or region-specific emission regulations. Where applicable, the Product is only certified to those specific emission regulations/standards which are clearly stated in the respective RRSA defined technical specifications. IT IS THE OWNER’S SOLE RESPONSIBILITY TO ENSURE THAT THE EXPORT/IMPORT, INSTALLATION, AND USE OF THE PRODUCT(S) COMPLIES WITH THE APPLICABLE EMISSION REGULATIONS IN THE COUNTRY OR REGION WHERE THE PRODUCT(S) WILL BE USED.

8. The Owner is entitled to rectify the defect or to have it rectified by third parties only in urgent cases where operational safety is at risk or in order to prevent disproportionately extensive damage; provided that Owner has informed RRSA and obtained prior written consent from RRSA. In such cases, RRSA shall, in its sole discretion, reimburse the costs incurred by the Owner up to an amount equivalent to the costs RRSA would have incurred had it remedied the defect itself.

9. This Limited Warranty gives the Owner specific legal rights, and the Owner may also have other rights, which vary from state to state. Some states do not allow warranty duration limitations and/or certain exclusions or limitation of incidental or consequential damages. Therefore, the previously expressed exclusion(s) may not apply to Owner. If any one or more of the provisions contained in this Limited Warranty shall be invalid, illegal, or unenforceable in any respect, the validity, legality, or enforceability of the remaining provisions contained therein shall not in any way be affected or impaired thereby.

10. This Limited Warranty is governed by the laws of the State of Michigan without regard to its conflicts of law principles and excluding the United Nations Convention for the International Sale of Goods. Any and all disputes between the parties that may arise pursuant to the sale or use of the Product shall be heard and determined before an appropriate state of federal court located in Oakland County, Michigan. The Owner acknowledges that such court has the jurisdiction to interpret and enforce the provisions herein, and Owner waives any and all objections that it may have as to personal jurisdiction or venue in any of the above courts.

11. In order to obtain performance of an RRSA warranty obligation, the Owner should contact the nearest RRSA authorized distributor, dealer, or service outlet for instructions. To find the location of the nearest RRSA authorized distributor, dealer, or service outlet call +1 248-560-8000 or write to: Rolls-Royce Solutions America Inc. Warranty Department, 39525 MacKenzie Drive, Novi, MI 48377.

Power Solutions International, Inc.
201 Mittel Drive
Wood Dale, IL 60191
www.psiengines.com

0 Hour Non-Deteriorated Emissions Data for Permitting Customers

PSI EPA Engine Family **XPSIB8.80EMT** **"X" denotes generic model year**

PSI Engine Model Description **PSI-8.8L Turbo Emergency Stationary**

	8.8L Turbo LPG	8.8L Turbo NG
Displacement	8.8L	8.8L
Test Speed (rpm)	1800	1800
	g/KW-hr	**g/HP-hr**
BSCO	1.297	0.215
BSCO2	761.1	454.87
BSCH4	NA	0.048
BSTHC	0.028	NA
BSNMHC	NA	0.002
BSNOx	0.019	0.025
BSTHC+NOx	0.047	NA
BSNMHC+NOx	NA	NA
BSFC (kg/kw-hr)	0.253	0.211

Weighted compositie emissions from ISO 8178 D2 (LPG) & D1 (NG) test cycles
BSFC is the weighted composite fuel consumption over the emission test cycle
LPG Emission Data Units in g/KW-hr
NG Emission Data Units in g/HP-hr

PREPARED FOR:	QUOTE: GCP-031121-1001
Interstate Power Systems	

APPLICATION INFORMATION

Driver:	Engine
Make:	MTU
Model:	8.8L
Horsepower:	262
RPM:	1800
Compression Ratio:	10.0:1
Exhaust Flow Rate:	1176
Exhaust Temperature:	1200
Reference:	MTU Spec
Fuel:	Gas
Annual Operating Hours:	8760

EQUIPMENT

Housing	EAS-1450-0505F-2C4E
	14.5" Combo Housing, Critical Grade Silencer
	2 Element Capacity, Carbon Steel Construction
	5" Bottom Inlet, 5" End Outlet
Mounting	14.5" Wrap Around Bracket
Catalyst	RE-1450-T NSCR, Round 14.5"x3.5"
Elements Required	(2) Elements Required to meet Reductions
Minimum Exhaust Temp	1000*F

UNCONTROLLED EMISSIONS DATA

	g/bhp-hr
NOx:	N/A
CO:	N/A
THC:	N/A
NMHC:	N/A
NMNEHC:	N/A
HCHO:	N/A
Oxygen:	0.50%

POST CATALYST EMISSIONS DATA

	g/bhp-hr
NOx:	< 1.00
CO:	< 2.00
VOC:	< 0.70

Jason Martindale
Direct:505.592.1318
jmartindale@emittechnologies.com

PREPARED FOR:
Interstate Power Systems

QUOTE: GCP-031121-1001

ITEM #	*DESCRIPTION*	*QUANTITY*
1001-01	EAS-1450-0505F-2C4E Combo Housing	1
1001-02	14.5" Wrap Around Brackets	2
1001-03	RE-1450-T 14.5" NSCR Catalyst Element	2

WARRANTY

EMIT Technologies,Inc. warrants that the goods supplied will be free from defects in workmanship by EMIT Technologies, Inc. for a period of one (1) year from date of shipment. EMIT Technologies, Inc. will not be responsible for any defects which result from improper use, neglect, failure to properly maintain or which are attributable to defects, errors or omissions in any drawings, specifications, plans or descriptions, whether written or oral, supplied to EMIT Technologies, Inc. by Buyer.

Catalyst performance using an EMIT Air/Fuel ratio controller is dependent upon properly defined set-points, variable with engine and fuel gas composition. Air/fuel ratio controller performance is guaranteed, but not limited, to fuel gas with an HHV content of 1400 BTU/SCF.

Catalyst performance will be guaranteed for a period of 2 years from installation, or 17,000 operating hours, whichever comes first. The catalyst shall be operated with an automatic air/fuel ratio controller. The performance guarantee shall not cover the effects of excessive ash masking due to operation at low load, improper engine maintenance, or inappropriate lubrication oil. The performance guarantee shall not cover the effects of continuous engine misfires (cylinder or ignition) exposing the catalyst to excessive exothermic reaction temperatures.

Unless otherwise stated the exhaust temperature operating range at the converter inlet is 600°F minimum for oxidation catalyst and 750°F for NSCR catalyst and 1250°F maximum.

If a high temperature shut down switch is not installed, thermal deactivation of catalyst at temperatures above 1300 °F is not covered.

The catalyst conversion efficiencies (% reduction) will be guaranteed for engine loads of 50 to 100 percent.

Engine lubrication oil shall contain less than 0.6% ash (by weight) with a maximum allowable specific oil consumption of 0.01 gal/bhp-hr. The maximum ash loading on the catalyst shall be limited to 350 g/m3. Phosphorous and zinc additives are limited to 0.03% (by weight).

The catalyst must not be exposed to the following known poisoning agents, including: iron, nickel, sodium, chromium, arsenic, zinc, lead, phosphorous, silicon, potassium, magnesium, copper, tin, and mercury. Total poison concentrations in the gas are limited to 0.3 ppm.

Shipment - Promised shipping dates are approximate and are not guaranteed and are from the point of manufacture. EMIT Technologies,Inc. will not be liable for any loss, damage or delay in manufacture or delivery resulting from any cause beyond its control including, but not limited to a period equal to the time lost by reason of that delay. All products will be crated as per best practice to prevent any damage during shipment. Unless otherwise specified, Buyer will pay for any special packing and shipping requirements. Acceptance of goods by common carrier constitutes delivery to Buyer. EMIT Technologies,Inc. shall not be responsible for goods damaged or lost in transit.

PAYMENT TERMS AND ADVANCE PAYMENT REQUIREMENT

Terms: Credit is extended to purchaser for net 30 time period. If payment is not received in the net 30 timeframe, interest on the unpaid balance will accrue at a rate of 1.5% per month from the invoice date.

Advance Payment Requirement: Proposals with a project value of $100,000 or greater, and 60 days or greater time to completion, will require an advance payment of 30% of the total value. The advance payment will be invoiced to the customer upon receipt of the customer's purchase order. Advance payment is due 30 days after the date of the invoice. If payment is not received in the net 30 timeframe, interest on the unpaid balance will accrue at teh rate of 1.5% per month from the invoice date. Failure to pay this invoice may delay completion of the project outlined in this proposal.

Order Cancellation Terms: Upon cancellation of an order once submittal of a Purchase Order has occurred, the customer will pay a 25% restocking fee for Catalyst Housings, Catalyst Elements, and Air/Fuel Ratio Controllers; 50% restocking fee for Cooler Top Solutions,Exhaust System Accessories, and other Custom Built Products; 100% of all associated shipping costs incurred by EMIT; 100% of all project expenses incurred by EMIT for Field Services.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2022 MODEL YEAR
CERTIFICATE OF CONFORMITY
WITH THE CLEAN AIR ACT

OFFICE OF TRANSPORTATION
AND AIR QUALITY
ANN ARBOR, MICHIGAN 48105

Certificate Issued To: Power Solutions International, Inc.
(U.S. Manufacturer or Importer)

Certificate Number: NPSIB8.80EMT-009

Effective Date:
08/02/2021

Expiration Date:
12/31/2022

Byron J. Bunker, Division Director
Compliance Division

Issue Date:
08/02/2021

Revision Date:
N/A

Manufacturer: Power Solutions International, Inc.
Engine Family: NPSIB8.80EMT
Mobile/Stationary Certification Type: Stationary
Fuel : LPG/Propane
Natural Gas (CNG/LNG)
Emission Standards :
Stationary Part 1048
NMHC + NOx (g/kW-hr) : 2.7
HC + NOx (g/kW-hr) : 2.7
CO (g/kW-hr) : 4.4
Part 60 Subpart JJJJ Table 1
CO (g/Hp-hr) : 4.0
VOC (g/Hp-hr) : 1.0
NOx (g/Hp-hr) : 2.0
Emergency Use Only : Y

Pursuant to Section 213 of the Clean Air Act (42 U.S.C. section 7547) and 40 CFR Part 60, 1065, 1068, and 60 (stationary only and combined stationary and mobile) and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following nonroad engines, by engine family, more fully described in the documentation required by 40 CFR Part 60 and produced in the stated model year.

This certificate of conformity covers only those new nonroad spark-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 60 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Part 60. This certificate of conformity does not cover nonroad engines imported prior to the effective date of the certificate.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068.20 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Part 60. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Part 60.

This certificate does not cover large nonroad engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

MTU ONSITE ENERGY GS150 LP VAPOR GENERATOR
GENERATOR: 130 kW, 130kVA, 541 amps, 1800 RPM
VOLTAGE: 120/240v 1 phase
ENGINE: PSI 8.8, LP Vapor, EPA Certified

Selected Features Included:
Steel Sub Base, Battery Cables, Battery Rack, Flex Fuel Connector, Oil Drain Extension, Lube Oil and Anti-freeze
Electronic Isochronous Governor + / - .25%
UL2200 Listed, Prototype Tested, Factory Tested
130 Degree Rise Standby Alternator, Permanent Magnet
2 Year / 3,000 Hour Standby Limited Warranty

CONTROL PANEL: Basler DGC-1510 Control Panel
The expanded Digital Genset Controller utilizes microprocessor based technology to provide a versatile system for genset control, protection, monitoring and event logging. 4 Relay Board.

ENCLOSURE: Level 2 Sound Attenuated Weatherproof Enclosure includes bolt together sheet metal enclosure constructed with 14-gauge material, lockable hinged doors, keyed alike, a fixed storm proof air intake louver and expanded metal air discharge, muffler support brackets and exhaust piping allowing the muffler to be mounted internally, including rain cap. 79 dBA at 23'.

COOLING SYSTEM: Unit Mounted Radiator, 50 Degree Rise

CIRCUIT BREAKER: Square D, 80% rated, LSI, 2-400 Amps

BATTERY: Lead Acid Battery, Acid Resistant Steel Rack

BLOCK HEATER: 2,000 Watts, Mounted and Wired, Isolation Valves

VIBRATION ISOLATION: Neoprene Vibration Pads, Integral Vibration Isolation

BATTERY CHARGER: 12v, 6 Amps, mounted and wired

MUFFLER: Critical Grade Muffler Mounted Inside Enclosure

MISC: One Owner's Manual, Standard Color ANSI Gray

CONTROL EQUIPMENT

Catalyst Housing
Model: EAS-1200-0404F-2C4E
Manufacturer: EMIT Technologies, Inc
Element Size: Round 12" x 3.5"
Housing Type: 2 Element Capacity
Catalyst Installation: Accessible Housing
Construction: 10 gauge Carbon Steel
Sample Ports: 6 (0.5" NPT)
Inlet Connections: 4" Flat Face Flange
Outlet Connections: 4" Flat Face Flange
Configuration: Side In / End Out
Silencer: Integrated
Silencer Grade: Critical
Insertion Loss: 25-30 dBA
Catalyst Element
Model: RE-1200-T
Catalyst Type: NSCR, Standard Precious Group Metals
Substrate Type: BRAZED
Manufacturer: EMIT Technologies, Inc
Element Quantity: 1
Element Size: Round 12" x 3.5"

Gas Generator Set

mtu 8V0110 GS150

150 kWe/60 Hz/Standby/208 - 600V

System ratings

Voltage (L-L)	240V †	240V †	208V †	240V †	480V †	600V	380V †
Phase	1	1	3	3	3	3	3
PF	1	1	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60	60
Natural Gas (NG)							
Amps	625	625	520	451	226	180	285
kW/kVA	150/150	150/150	150/187.5	150/187.5	150/187.5	150/187.5	150/187.5
Liquid Propane (LP)							
Amps	542	542	451	391	195	156	247
kW/kVA	130/130	130/130	130/162.5	130/162.5	130/162.5	130/162.5	130/162.5
NG and LP							
skVA@30% voltage Dip	196	187	296	296	394	315	282
Generator model	431PSL6224	431CSL6206	431PSL6202	431PSL6202	431PSL6202	431CSL6240	431PSL6204
Temp rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	4 LEAD	12 LEAD DOUBLE DELTA	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	4 LEAD WYE	12 LEAD WYE

† UL 2200 offered

Note: This unit is available with a dual fuel configuration.

Certifications and standards

- Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- Seismic certification – optional
  - 2018 IBC certification
  - OSHPD pre-approval
- UL 2200 – optional (refer to *System ratings* for availability)
- CSA – optional
  - CSA C22.2 No. 100
  - CSA C22.2 No. 14
- Performance Assurance Certification (PAC)
  - Generator set tested to ISO 8528-5 for transient response
  - Verified product design, quality and performance integrity
  - All engine systems are prototype and factory tested
- Power rating
  - Accepts rated load in one step per NFPA 110

A Rolls-Royce solution

Standard features*

- Single source supplier
- Global product support
- Two (2) Year/3,000 Hour Basic Limited Warranty
- PSI 8.8L TCAC engine
  - 8.8 liter displacement
  - 4-cycle
- 3-way catalyst
- Optional fuels: LP liquid and dual fuel
- Engine-generator resilient mounted
- Complete range of accessories
- Cooling system
  - Integral set-mounted
  - Engine-driven fan
- Generator
  - Brushless, rotating field generator
  - 2/3 pitch windings
  - 300% short circuit capability
- Digital control panel(s)
  - UL recognized, CSA Certified, NFPA 110
  - Complete system metering
  - LCD display

Standard equipment*

Engine

- Air cleaner
- Oil pump
- Oil drain extension and shut-off valve
- Full flow oil filter
- Jacket water pump
- Thermostat
- Blower fan and fan drive
- Radiator - unit mounted
- Electric starting motor - 12V
- Governor - electronic isochronous
- Base - formed steel
- SAE flywheel and bell housing
- Charging alternator - 12V
- Battery rack and cables
- Flexible exhaust connection
- Liquid cooled, ball bearing turbcharger
- EPA certified engine

Generator

- NEMA MG1, IEEE, and ANSI standards compliance for temperature rise and motor starting
- Sustained short circuit current of up to 300% of the rated current for up to 10 seconds
- Self-ventilated
- Superior voltage waveform
- Solid state, volts-per-hertz regulator
- ± 1% voltage regulation no load to full load
- Brushless alternator with brushless pilot exciter
- 4 pole, rotating field
- 130 °C maximum standby temperature rise
- 1-bearing, sealed
- Flexible coupling
- Full amortisseur windings
- 125% rotor balancing
- 3-phase voltage sensing
- 100% of rated load - one step
- 5% maximum total harmonic distortion

Digital control panel(s)

- Digital metering
- Engine parameters
- Generator protection functions
- Engine protection
- SAE J1939 engine ECU communications
- Windows®-based software
- Multilingual capability
- Communications to remote annunciator
- Programmable input and output contacts
- UL recognized, CSA certified, CE approved
- Event recording
- IP 54 front panel rating with integrated gasket
- NFPA 110 compatible

* Represents standard product only. Consult your local ***mtu*** Distributor for additional configurations.

Application data

Engine

Manufacturer	PSI
Model	8.8L TCAC
Type	4-cycle
Aspiration	turbocharged, intercooled
Arrangement	8-V
Displacement: L (in^3)	8.8 (535)
Bore: cm (in)	11.05 (4.35)
Stroke: cm (in)	11.43 (4.5)
Compression ratio	10:1
Rated rpm	1,800
Engine governor	Bosch
Maximum power (NG): kWm (bhp)	195.0 (261.5)
Maximum power (LP): kWm (bhp)	171.6 (230.1)
Steady state frequency band	± 0.75%
Air cleaner	dry

Liquid capacity

Total oil system: L (gal)	9.0 (2.38)
Engine jacket water capacity: L (gal)	13.4 (3.5)
System coolant capacity: L (gal)	25.5 (6.7)

Electrical

Electric volts DC	12
Cold cranking amps under -17.8 °C (0 °F)	925
Batteries: group size	31
Batteries: quantity	1

Fuel inlet - vaporous supply

Fuel supply connection size	2" NPT
Fuel supply pressure: mm H_2O (in. H_2O)	178–279 (7–11)

Fuel inlet - liquid supply

Fuel supply connection size	#6 (3/8") female SAE 45° flare
Maximum fuel supply pressure: kPa (PSI)	2,150 (312)

Fuel consumption (NG-1000 BTU/ft^3 / LP-2500 BTU/ft^3)

	NG	LPG
At 100% of power rating: m^3/hr (ft^3/hr)	56.2 (1,986)	19.7 (695)
At 75% of power rating: m^3/hr (ft^3/hr)	43.9 (1,549)	15.1 (534)
At 50% of power rating: m^3/hr (ft^3/hr)	31.8 (1,121)	11.0 (389)

Cooling - radiator system

	NG and LPG
Ambient capacity of radiator: °C (°F)	48 (118.4)*
Maximum restriction of cooling air: intake and discharge side of radiator: kPa (in. H_2O)	0.12 (0.5)
Water pump capacity: L/min (gpm)	125 (33.0)
Heat rejection to coolant: kW (BTUM)	88.3 (5,021)
Heat radiated to ambient: kW (BTUM)	41.1 (2,337)
Heat rejected to charge air cooler: kW (BTUM)	13.8 (782)
Fan power: kW (hp)	11.9 (16.0)

* Installation of gravity exhaust louvers reduces the ambient capacity of the cooling system by an additional 3 °C (5.5 °F).

Air requirements

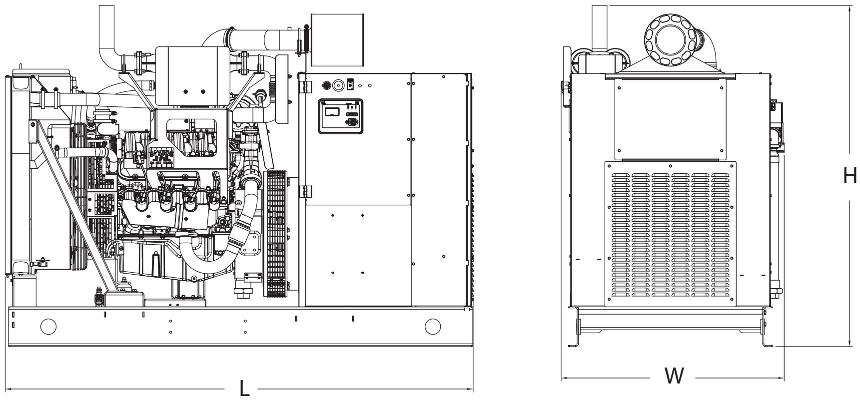
	NG and LPG
Aspirating: *m^3/min (SCFM)	10.33 (365)
Air flow required for radiator cooled unit: *m^3/min (SCFM)	229.8 (8,115)
Remote cooled applications; air flow required for dissipation of radiated generator set heat for a maximum of 25 °F rise: *m^3/min (SCFM)	211.6 (7,473)

* Air density = 1.184 kg/m^3 (0.0739 lbm/ft^3)

Exhaust system

	NG and LPG
Gas temperature (stack): °C (°F)	649 (1,200)
Gas volume at stack temperature: m^3/min (CFM)	33.3 (1,176)
Maximum allowable back pressure at outlet of engine, before piping: kPa (in. H_2O)	10.2 (41)

Weights and dimensions



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.

System	Dimensions (L x W x H)	Weight
Open Power Unit (OPU)	2,388 x 1,137 x 1,740 mm (94 x 44.8 x 68.5 in)	1,520–1,800 kg (3,350–3,950 lb)

Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

Sound data

Unit type	Standby full load (NG)	Standby full load (LP)
Level 0 (OPU): dB(A)	86.5	86.6

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

Emissions data

Fuel type	THC + NO_x	CO
Natural gas	N/A	0.22
Liquid propane	0.035	0.95

— All units are in g/hp-hr and are EPA weighted cycle values. Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations.

Rating definitions and conditions

— Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.

— Nominal ratings at standard conditions: 25 °C and 300 meters (77 °F and 1,000 feet).

— Deration factor:
- Consult your local ***mtu*** Distributor for altitude derations.
- Consult your local ***mtu*** Distributor for temperature derations.

C/F = Consult Factory/***mtu*** Distributor

Subject to change. | 231262 | 2021-05

Digital Generator Set Controller Data Sheet

MGC-1500 Series

The MGC-1500 Series controllers include the following models which are described throughout this document.*

— MGC-1510
— MGC-1520

MGC Series Generator Set Controllers are rugged, reliable, and easy-to-use digital generator set control systems. The MGC-1500 Series is perfectly focused, combining rugged construction and microprocessor technology to offer a product that will hold up to almost any environment and is flexible enough to meet your application's needs.

PRODUCT HIGHLIGHTS

- Three-phase generator metering
- Engine metering
- Generator set control
- Engine and generator protection
- BESTCOMS*Plus*®
  - Windows®-based software for optional remote operation (Software can be downloaded at www.mtu-solutions.com)
  - Programming and setup software
  - Intuitive and powerful
  - Remote control and monitoring
  - Programmable logic
  - USB communications
- Suitable for rental generator sets with high/low sensing, single or three phase override, wye/delta/grounded delta configurable, and alternate frequency override (50/60 Hz)
- Resistive sender inputs for oil pressure and coolant temperature
- Multilingual capability
- SAE J1939 Engine Control Unit (ECU) communications (Refer to *Configuration Options*)
- Remote annunciation with RDP-110
- Event recording (up to 30 events in non-volatile memory)
- Extremely rugged, fully potted design
- Seven programmable contact inputs with Input 1 programmed to recognize an emergency stop
- Start, run, and prestart relays with four programmable outputs
- UL recognized, CSA certified, CE approved
- IP56 rating per IEC 60529
- NFPA-110 compatible
- Microprocessor based
- Complete system metering
- Expandable to meet customer needs

* Please refer to the last page of this data sheet for available MGC-1500 series configuration options. The MGC Series Controller Comparison Data Sheet is a available as a reference for all MGC series configuraton options..

DIAGRAM

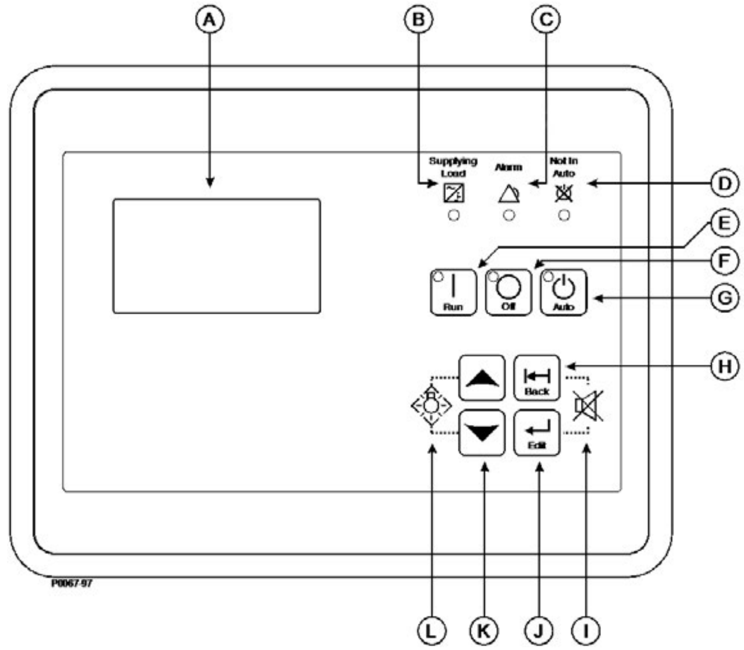


Figure 1: Front Panel Descriptions

A. Liquid crystal display
B. Supplying load indicator
C. Alarm indicator
D. Not in auto indicator
E. Run pushbutton and mode indicator
F. Off pushbutton and mode indicator
G. Auto pushbutton and mode indicator
H. Back pushbutton
I. Alarm silence pushbutton combination
J. Edit pushbutton
K. Arrow pushbuttons
L. Lamp test pushbutton combination

FUNCTIONS

Generator set protection

Generator ANSI codes
— Overvoltage (59)
— Overfrequency (81O)
— Voltage phase imbalance (47)
— Undervoltage (27)
— Underfrequency (81U)
— Overcurrent (50)

All generator set protection features are programmable as alarms, pre-alarms, status, or not used.

Alarms (shutdowns)
— Low oil pressure
— High coolant temperature
— Low coolant temperature
— Overspeed
— Overcrank
— Coolant temp sender fail (non-ECU engines)
— Oil pressure sender fail (non-ECU engines)
— Emergency stop
— Critical low fuel level (refer to *Configuration Options*)

Pre-alarms (warnings)
— Low oil pressure
— Low coolant temperature
— Weak battery voltage
— Low fuel level
— High fuel level
— High coolant temperature
— Battery overvoltage

All alarms and pre-alarms can be enabled or disabled via the BESTCOMSPlus® PC software or the front panel.
Additional custom alarms and pre-alarms are available upon request.

FUNCTIONS, continued

Generator set metering

— Generator parameters include voltage, current, real power (watts), apparent power (VA), and power factor. The view can be programmed to display up to 20 parameters using the scrolling and time delay feature.
— Engine parameters include oil pressure, coolant temperature, RPM, battery voltage, fuel level, engine runtime, and various SAE J1939 supported parameters.

Engine control

— Cranking control: cycle or continuous (quantity and duration fully programmable)
— Engine cooldown: smart cooldown function saves time and fuel
— Successful start counter: counts and records successful engine starts
— Timers:
  - Engine cooldown timer
  - Engine maintenance timer
  - Pre-alarm time delays for weak/low battery voltage
  - Alarm time delay for overspeed
  - Alarm time delay for sender failure
  - Arming time delays after crank disconnect:
    - Low oil pressure
    - High coolant temperature
  - Pre-crank delay
  - Continuous or cycle cranking time delay
  - Programmable logic timers

Event recording

The MGC-1500 Series has an event recorder that provides a record of alarms, pre-alarms, engine starts, engine runtime loaded, engine runtime unloaded, last run date, and many other events that are all date and time stamped to help the user determine the cause and effect of issues related to the generator set. Contains up to 30 event records each retaining numerous occurrences in memory. Time, date, and engine hour detail are available for the most current 30 occurrences within each event record.

Transfer switch control (Mains failure)

(Refer to *Configuration Options*)

The MGC-1500 Series has the ability to detect a mains failure via a single- or three-phase bus input. A mains failure is established when any one of the following conditions are met:

— Any phase of bus voltage falls below the dead bus threshold
— Any phase of bus voltage is unstable due to overvoltage or undervoltage
— Any phase of bus voltage is unstable due to overfrequency or underfrequency

When conditions are met, the MGC-1500 Series will start the generator set and, when ready, will send generator and mains breaker commands to apply power to the load from the generator set. The MGC-1500 Series implements open or closed breaker transitions to and from the mains. When the mains returns and is considered stable, the MGC-1500 Series will transfer the load back to the mains and stop the engine.

USB port

The USB communication port can be used with BESTCOMS*Plus*® software to quickly configure an MGC-1500 Series with the desired settings or retrieve metering values and event log records.

Programmable logic

The MGC-1500 Series offers a very powerful, yet easy-to-use, programmable logic scheme, BESTlogic™*Plus,* for custom programming of the various inputs, outputs, alarms, and pre-alarms. It allows these elements to be integrated into a complete logic scheme so that the user can meet even the most complex specification. The Programmable logic control includes the selection of logic gates and timers with drag-and-drop technology to make it fast and simple.

Remote display panel annunciation

(Refer to *Configuration Options*)

The MGC-1500 Series can communicate to a remote display panel, Model RDP-110. This requires only two wires to annunciate many of the alarms and pre-alarms required by NFPA-110 Level I and II. External power is required.

SAE J1939 communications

(Refer to *Configuration Options*)

SAE J1939 CANBus communications allows the MGC-1500 Series to communicate with the ECU to gather critical engine information like oil pressure, engine coolant temperature, RPM, battery voltage, and much more. By utilizing the ECU, the addition of analog engine senders is no longer required. This can save substantial money for the installer. It also eliminates any errors or discrepancies between the ECU data and the data displayed on the MGC-1500 Series that may be present due to analog sender inaccuracies or incompatibility. An additional benefit is access to the ECU's diagnostic troubleshooting codes (DTCs). The DTCs provide information about the engine's operating conditions and communicate these via SAE J1939 to the MGC-1500 Series, eliminating the need for hand-held service tools to diagnose simple engine issues.

SPECIFICATIONS

Operating power
- Nominal: 12 or 24 VDC
- Range: 6 to 32 VDC
- Power consumption:
  - Sleep mode: 4.5 W
  - Normal operational mode: 6.5 W - Run mode, LCD heater off, three relays energized
  - Maximum operational mode: 14 W - Run mode, LCD heater on, seven relays energized
  - Battery ride-through: Withstands cranking ride-through down to 0 V for 50 ms (typical)

Current sensing (5 Amp CT inputs)
- Continuous rating: 0.1 to 5.0 Aac
- One second rating: 25 Aac
- Burden: 1 VA

Voltage sensing
- Range: 12 to 576 V rms, line-to-line
- Frequency range: 10 to 72 Hz
- Burden: 1 VA
- One second rating: 720 V rms

Contact sensing/input contacts
Contact sensing inputs include one emergency stop input and seven programmable inputs. The emergency stop input accepts normally closed, dry contacts. The remote emergency stop is limited to 75 ft. standard. Extended runs are available with an optional relay. All programmable inputs accept normally open, dry contacts. The factory may utilize up to three of these inputs.

Engine system inputs
- Fuel level sensing resistance range: 5 to 250 Ω nominal
- Coolant temperature sensing resistance range: 5 to 2,750 Ω nominal
- Oil pressure sensing resistance range: 5 to 250 Ω nominal
- Engine speed sensing:
  - Magnetic pickup or CANBus
    - Magnetic pickup voltage range: 3 to 35 V peak (6 to 70 V peak to peak)
    - Magnetic pickup frequency range: 32 to 10,000 Hz

Output contacts
- (7) total outputs: (3) 5 A @ 28 VDC and (4) 2 A @ 28 VDC
- The factory utilizes the following on each generator set which can be reprogrammed as needed:
  - (3) 5 A @ 28 VDC for Pre-start, Start, and Run
  - (4) 2 A @ 28 VDC for general purpose

Metering
Generator voltage (rms)
- Metering range: 12 to 576 VAC (direct measurement), up to 9,999 VAC (with appropriate voltage transformer)
- Accuracy: ±1% of programmed rated voltage or ±2 VAC (subject to accuracy of voltage transformer when used)

Generator current (rms)
- Generator current is measured at the secondary windings of 5 A CTs.
- Metering range: 0 to 5,000 Aac
- CT primary range: 1-5,000 Aac, in primary increments of 1 Aac
- Accuracy: ±3% of programmed rated current or ±3 Aac (subject to accuracy of CTs)

Generator frequency
- Metering range: 10 to 72 Hz
- Accuracy: ±0.25% or 0.05 Hz

Apparent power
- Indicates total kVA and individual line kVA (four-wire, line-to-neutral or three-wire, line-to-line)
- Accuracy: ±5% of the full-scale indication or ±4 kVA

Power factor
- Metering range: 0.2 leading to 0.2 lagging
- Accuracy: ±0.02

Real power
- Indicates total kW and individual line kW (four-wire, line-to-neutral or three-wire, line-to-line)
- Accuracy: ±5% of the full-scale indication or ±4 kW

Oil pressure
- Metering range: 0 to 150 psi or 0 to 1,034 kPa
- Accuracy: ±3% of actual indication or ±2 psi or ±12 kPa (subject to accuracy of sender)

Coolant temperature
- Metering range: 0 °C to 204 °C (32 °F to 410 °F)
- Accuracy: ±3% or actual indication or ±2° (subject to accuracy of sender).

Fuel level
- Metering range: 0 to 100%
- Accuracy: ±3% (subject to accuracy of sender)

Battery voltage
- Metering range: 6 to 32 VDC
- Accuracy: ±3% of actual indication or ±0.2 VDC

Engine RPM
- Metering range: 0 to 4,500 rpm
- Accuracy: ±2% of actual indication or ±2 rpm

Engine run time
- Engine run time is retained in non-volatile memory
- Metering range: 0 to 99,999 h; update interval: 6 min
- Accuracy: ±1% of actual indication or ±12 min

SPECIFICATIONS, continued

Metering, continued

Maintenance timer
- Maintenance timer indicates the time remaining until generator set service is due. Value is retained in non-volatile memory.
- Metering range: 0 to 5,000 h; update interval: 6 min
- Accuracy: ±1% or actual indication or ±12 min

Generator protection functions

Overvoltage (59) and undervoltage (27)
- Pickup range: 70 to 576 VAC
- Activation delay range: 0 to 30 s

Overfrequency (81O) and underfrequency (81U)
- Pickup range: 45 to 66 Hz
- Pickup increment: 0.1 Hz
- Activation delay range: 0 to 30 s

Phase imbalance (47)
- Pickup range: 5 to 100 VAC
- Pickup increment: 1 VAC
- Activation delay range: 0 to 30 s
- Activation delay increment: 0.1 s

Overcurrent (51)
- Pickup range: 0.18 to 1.18 Aac (1 A current sensing)
- Time dial range: 0 to 7,200 s (fixed time curve)

Environmental
- Temperature
  - Operating: -40 °C to 70 °C (-40 °F to 158 °F)
  - Storage: -40 °C to 85 °C (-40 °F to 185 °F)
- Humidity: IEC 68-2-38
- Salt fog: ASTM B 17-73, IEC 68-2-11 (tested while operational)
- Ingress protection: IEC IP54 for front panel
- Shock: 15 G in three perpendicular planes
- Vibration: swept over the following ranges for 12 sweeps in each of three mutually perpendicular planes with each 15-minute sweep.
  - 5 to 29 to 5 Hz at 1.5 G peak for 5 min
  - 29 to 52 to 29 Hz at 0.036” DECS-A for 2.5 min
  - 52 to 500 to 52 Hz at 5 G peak for 7.5 min

Agency approvals
- UL/CSA approvals: “cURus” approved to UL 6200 and CSA C22.2 No.14
- NFPA Compliance: complies with NFPA Standard 110, standard for emergency and standby power
- CE Marked: complies with applicable EC directives

ADDITIONAL SPECIFICATIONS

Battery backup for real time clock
The MGC-1500 Series provides a real-time clock with capacitor backup that is capable of operating the clock for up to 24 hours after power is removed from the controller. As the capacitor nears depletion, an internal backup battery takes over and maintains timekeeping. The battery will maintain the clock for approximately 10 years, depending on conditions. The battery is not replaceable. The clock is used by the events recorder function to timestamp events, and the exercise timer is used to start and stop the generator set when the exercise feature is utilized.

Breaker management
The MGC-1500 Series is capable of controlling the generator breaker and the mains breaker. The status of the breakers is determined by using BESTlogic™Plus programmable logic to set up the GENBRK and MAINSBRK logic blocks. These logic blocks have outputs that can be configured to energize an output contact and control a breaker, as well as inputs for breaker control and status. The MGC-1500 Series will attempt to close a breaker only after verifying that it can be closed. If the breaker cannot be closed, the close request will be ignored. Only one breaker can be closed at a time. Synchronization is required before closing the breaker to a live bus. Closure to a dead bus can be performed after meeting dead bus threshold and timing requirements set by the user.

OPTIONAL ACCESSORIES

(Refer to *Configuration Options*)

Contact Expansion Module 2020 (CEM-2020)

The CEM-2020 is a remote device that provides additional MGC-1500 Series contact inputs and outputs, giving the user flexibility to use the same model MGC-1500 Series generator set controller for simple functions or more complicated applications that require contact functionality or duplication of contacts for remote annunciation. Its features include:

- **10 Contact Inputs:** the CEM-2020 provides 10 programmable contact inputs with the same functionality as the contact inputs on the MGC-1500 Series.
- **24 Contact Outputs:** the CEM-2020 provides 24 Form C programmable output contacts with the same functionality as the output contacts on the MGC-1500 Series. The output ratings of the Form C contacts are:

Output No.	Rating (Cont.)	Additional Information
5-16	1 A @ 30 VDC	This is a gold flash contact for low current circuits.
17-28	4 A @ 30 VDC	

Table 1: Output Ratings Form C Contacts

- **Communications via CANBus:** the CEM-2020 communicates to the MGC-1500 Series via SAE J1939 CANBus communications and allows the user to program the functionality of these inputs and outputs in the BESTCOMSPlus® software.
- The user can add labels for the inputs and outputs that appear in BESTCOMS®Plus, on the front panel, and in programmable logic. All the functionality can be assigned to these inputs and outputs as if they were an integrated part of the MGC-1500 Series. The CEM-2020 module has all of the environmental ratings of the MGC-1500 Series, including a model for UL Class1 Div2 applications. The CEM-2020 terminals accept a maximum wire size of 12 AWG, while the chassis ground requires 12 AWG wire. Flexibility is one of the benefits of the MGC-1500 Series, and this add-on module enhances that benefit even further.

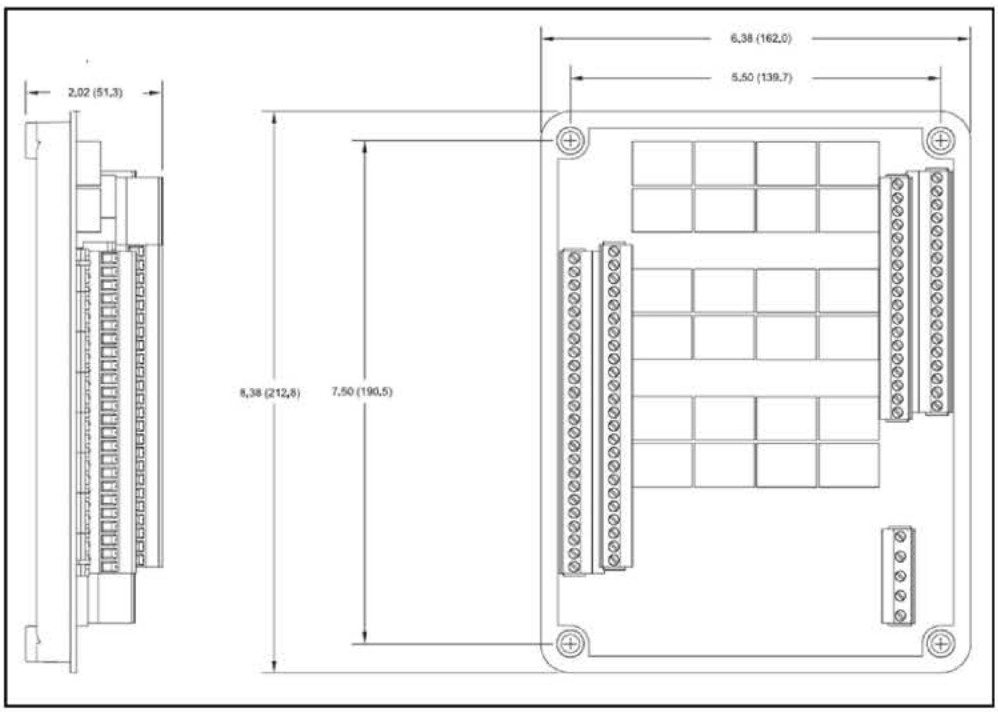


Figure 2: CEM-2020 Overall Dimensions

CONFIGURATION OPTIONS

Generator protection

	MGC-1510	MGC-1520
Standard		
Phase Imbalance (47)	X	X
Overcurrent (50)	X	X
Overvoltage (59)	X	X
Undervoltage (27)	X	X
Underfrequency (81U)	X	X
Overfrequency (81O)	X	X
Reverse Power (32)		
Loss of Excitation (40Q)		
Enhanced		
Overcurrent (51)		
Vector Shift (78)		
Rate of Change of Frequency (81R)		
Ground Fault		

Note: Numbers in parentheses above are ANSI standard device numbers denoting which features the controllers support.

Inputs

	MGC-1510	MGC-1520
Controller		
Digital	7	7
Analog (Dedicated)	3	-
Analog	-	-
CEM		
Digital	-	10
AEM		
Analog	-	-
TC	-	-
RTD	-	-

Outputs

	MGC-1510	MGC-1520
Controller		
Digital Form A, 30 Amp	-	-
Digital Form A, 5 Amp	3	3
Digital Form A, 2 Amp	4	4
Analog	-	-
CEM		
Digital Form C, 4 Amp	-	12
Digital Form C, 1 Amp	-	12
AEM		
Analog	-	-
External to Controllers (CEM)		
Digital Form C, 10 Amp (Interposing Relay)	-	10

Communication

	MGC-1510	MGC-1520
ModBus RTU (RS-485)		
ModBus TCP-IP		
RDP-110	X	X
CANBus		X
Modem Interface (RS-232)		
Ethernet		

Metering

	MGC-1510	MGC-1520
Bus 1 Voltage		
Single Phase	X	X
Three Phase	X	X
Bus 2 Voltage		
Single Phase		
Three Phase		
Current Transformers		
Generator	3	3
Auxiliary	-	-

Subject to change. | WT00032339 | 2020-07

LC-50

Integrated gas mixer, throttle body, and programmable speed control/ actuator

APPLICATION

The LC-50 is designed for use on gaseous fueled industrial engines between 5 and 100 kW (7 and 134 hp). The throttle and venturi sizes are between 24 and 50 mm. Applications include power generation, refrigeration units, pumps, irrigation, and mobile industrial.

The mixer can be used with propane and natural gas and requires a zero pressure regulator. The throttle body incorporates the proven Woodward LCS speed control, which operates the throttle plate. The LC-50 can be programmed via the RS-232 port of a PC/laptop to a variety of configurations, as follows:

- isochronous speed control
- droop
- auxiliary input
- dual dynamics
- adjustable ramp time
- self-tuning
- overspeed/underspeed protection
- remote speed setting
- three speed select
- error relay driver

DESCRIPTION

The LC-50 provides a building block approach to total engine management. This modular design consists of a die-cast aluminum throttle body, mixer, plus a fully programmable integrated digital speed control and bi-directional actuator.

This unique design includes a venturi style annular ring mixer with no moving parts for superior mixing. The throttle body incorporates a corrosion-protected, plated steel shaft, plate, and a sealed ball-bearing design for durability and long life. An internal throttle return spring is standard to close the throttle in the event of power failure.

The LC-50 modular design reduces total engine assembly cost, eliminates external linkages, lowers inventory and part number proliferation. The programmable controller offers security to your configuration.

The LC-50 is compatible with Woodward's venturi-style mixer and other brands of gas mixers using suitable adapters (see LCS product specification 03225 for actuator details and operating parameters).

- Integrated, bi-directional actuator and programmable speed control
- Suitable for gaseous engines
- OEM configurable
- Venturi mixer has superior mixing with no moving parts
- Eliminates external linkages
- Reduces total engine assembly costs
- Optional positioner mode
- Five sizes available
- Optional air/fuel ratio trim valve
- Sealed ball-bearing throttle body design
- Optional external throttle position switch

WOODWARD

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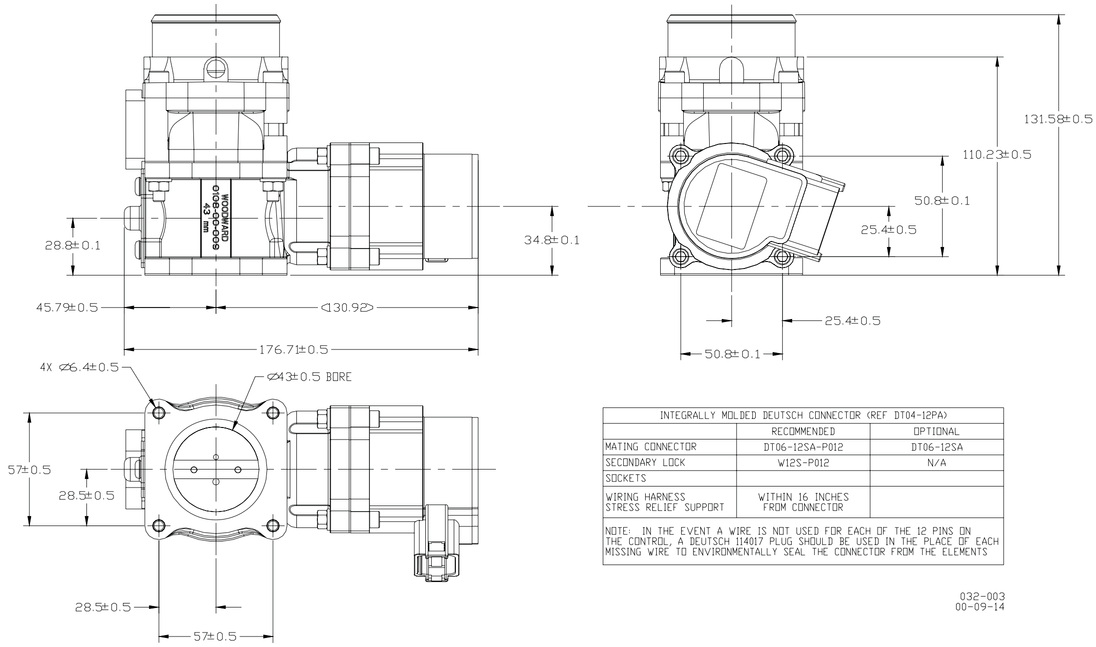
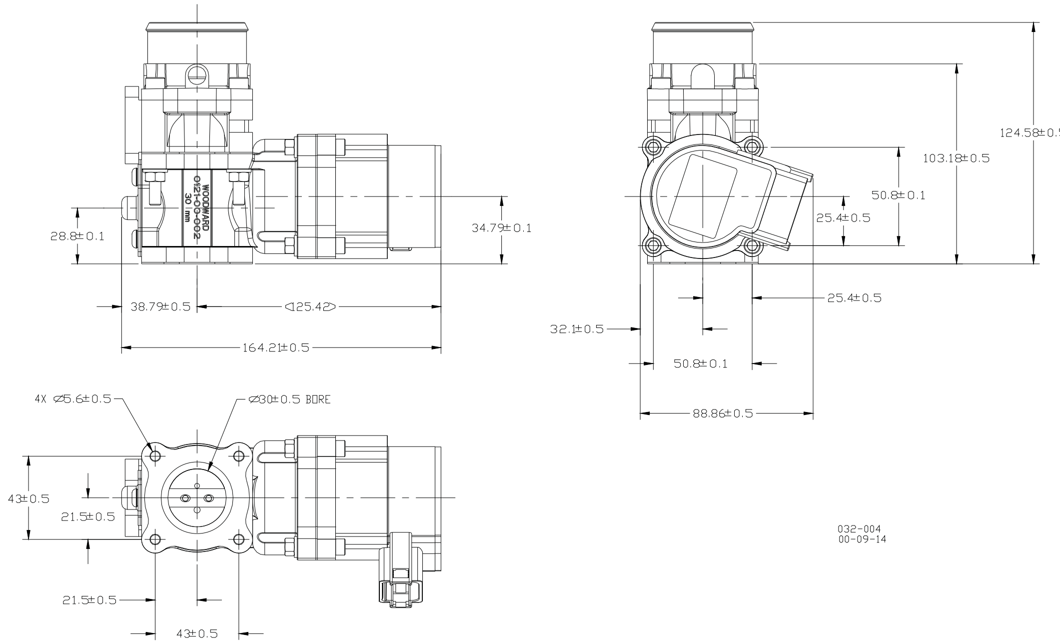


INTEGRALLY MOLDED DEUTSCH CONNECTOR (REF DT04-12PA)		
	RECOMMENDED	OPTIONAL
MATING CONNECTOR	DT06-12SA-P012	DT06-12SA
SECONDARY LOCK	W12S-P012	N/A
SOCKETS		
WIRING HARNESS STRESS RELIEF SUPPORT	WITHIN 16 INCHES FROM CONNECTOR	
NOTE: IN THE EVENT A WIRE IS NOT USED FOR EACH OF THE 12 PINS ON THE CONTROL, A DEUTSCH 114017 PLUG SHOULD BE USED IN THE PLACE OF EACH MISSING WIRE TO ENVIRONMENTALLY SEAL THE CONNECTOR FROM THE ELEMENTS		

Representative Drawing of 43 mm LC-50
(Do not use for construction)



Representative Drawing of 30 mm LC-50
(Do not use for construction)

Technical Manual 26135

For more information contact:

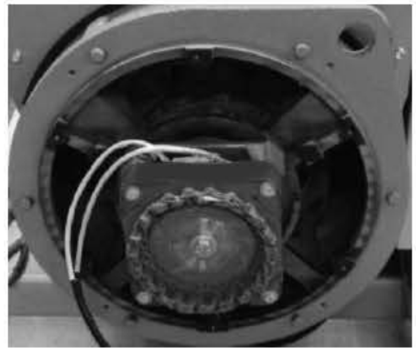
03/3/F

Generator System Data Sheet

Permanent Magnet Generator (PMG)

DESCRIPTION

A permanent magnet generator (PMG) is standard on 450 kW and larger units and is available as an optional accessory on most units smaller than 450 kW. The PMG is an improved method of supplying power to the voltage regulator and adds distinct advantages over the alternative shunt type power supply.



FEATURES

Improved transient response

When a generator is subject to a large step load, the generator's terminal voltage experiences a sudden voltage dip. With a shunt style regulator, reduced voltage means the regulator's ability to increase excitation is reduced and voltage recovery will take longer. Power from a PMG is only dependent on the speed of rotation so voltage regulator power, and therefore excitation power, is not compromised during a load step.

300% short circuit capability

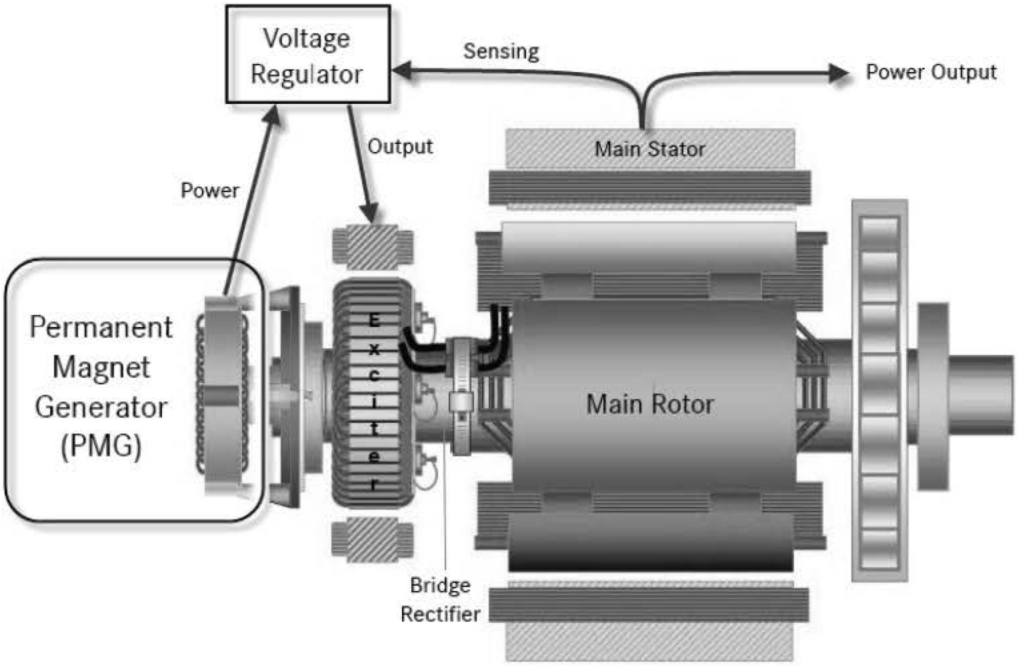
The PMG enables the generator to provide up to 300% short circuit current for 10 seconds. This is important when a fault occurs to ensure current continues to flow long enough for downstream breakers to trip and clear the fault. When a fault occurs with a shunt type regulator, the sudden drop in voltage indicates the regulator has no power to increase excitation to keep current flowing. Without current flow, the downstream breakers may not trip.

Resistant to the effects of harmonics

A PMG is also beneficial in applications with harmonic producing loads. When rectifier-type loads are present and cause voltage wave form notching, the disrupted voltage wave form can affect voltage regulator operation on shunt powered regulators. Unlike a shunt regulator, the PMG supplies the regulator with a power source which is isolated from the electrical system.

A Rolls-Royce solution

Permanent Magnet Generator (PMG) Data Sheet



Generator Equipped with PMG

EXCITATION SYSTEM COMPARISON CHART

	AREP	Permanent Magnet Generator (PMG)
Motor starting capability	High	High
Short circuit current capability	300% at 60 Hz	300% at 60 Hz
Susceptibility to non-linear loads	Minimum	Minimum
Number of components	Minimum	Maximum
Retrofitability	No	Yes
Generator length	Minimum	Maximum
Stator design	Special	Standard with PM attachment
Voltage buildup	Uses residual magnetism and permanent magnet inserts on some frames	Positive from permanent magnets

Subject to change. | WT0037948 | 2020-07

marathon® Generators

DVR® 2400
DIGITAL VOLTAGE REGULATOR

NEW FEATURES
- USB 2.0 access through front panel
- Euro style connector for low voltage connections
- Event Logging
- PMG voltage metering
- Polarity configuration for external inputs
- Configurable cut-in and cut-out frequencies
- Retain/reset configuration of remote adjust

FOUR DIGIT HMI DISPLAY
From intial setup to monitoring regulator status, this display provides innovative, fast and easy setup.

REGULATION MODES
Single and Three phase (AVR), Manual Field Current Regulation (FCR), Reactive Power Regulation (VAR) and Power Factor Regulation (PF). All modes compatible with control by external devices.

GENERATOR SOFT START
Controlled increase to rated voltage limits overshoot during voltage build-up in AVR modes.

TRUE RMS VOLTAGE SENSING - SINGLE OR THREE PHASE
Directly sense 100 to 600 Volts at 50/60 Hz. Circuitry senses true RMS voltage for superior regulation.

SINGLE PHASE POWER METERING

FRAME SIZE SPECIFIC PID SELECTION
Simply select the appropriate frame size and your gains are set.

ROBUST GENERATOR PROTECTION FEATURES
9 different Alarm and Shutdown protection features, many are customizable for your application including:
- Field Over & Under Excitation
- Instantaneous Field Over Current
- Generator Over & Under Voltage
- Generator Voltage Imbalance
- Generator Loss of Sensing

REGAL®

DVR®2400 DIGITAL VOLTAGE REGULATOR

SPECIFICATIONS

Voltage Regulation - 0.25% over load range at rated power factor and constant generator frequency.

Output Power - 100 Vdc, 4.0 Adc continuous rating and 190 Vdc, 7.5 Adc forcing capability for one minute.

Exciter Field DC Resistance - 18 to 25Ω Range

Remote Voltage Adjustment - ±30% of nominal via analog input, ±15% via external contacts.

Input Power - 180 to 240 Vac, 250 to 300 Hz PMG power supply

Regulator Sensing - 100 to 600 Vac, 50/60 Hz, 1-phase/3phase

Operating Temperature - From -40°C to +70°C (-40°F to + 158°F)

Storage Temperature - From -40° C to +85°C (-40°F to +185°F)

Ingress Protection - IP52 (front side mounted in conduit box along with swing cover); IP10 (rear side with protective cover)

Shock - 20G in 3 perpendicular planes

Vibration - 2.5G at 5 to 26 Hz; 0.050" double amplitude (27 to 52 Hz); 7G at 53 to 500 Hz

Weight - 3.5 lb. (1361 g)

Humidity Testing - Per MIL-STD-705B, Method 711-D

Salt Fog Testing - Per MIL-STD-810E

EMI Compatibility

Immunity

Meets EN 61000-6-2: 2005 Electromagnetic compatibility (EMC) -Part 6-2: Generic standards- immunity for industrial environments.

Emission

- Meets EN 61000-6-4: 2007 Electromagnetic compatibility (EMC) - Part 6-4: Generic Standards - emmission standard for industrial environments

EMI Compatibility Tests

Immunity

- Electrostatic Discharge (ESD): IEC 61000-4-2
- Radiated RF: IEC 61000-4-3
- Electrical Fast Transient (EFT) /Burst: IEC 61000-4-4
- Conducted RF: IEC 61000-4-6
- Power Frequency and Magnetic Field: IEC 61000-4-8

Emission

- Radiated RF: EN 61000-6-4: 2007, 30 MHz to 1000 MHz

marathon® Generators

Regal Beloit America, Inc.
100 East Randolph Street
Wausau, WI 54402-8003
PH: 715-675-3359

www.marathonelectric.com

REGAL®

MAGNAPLUS®

MARATHON ELECTRIC
SYNCHRONOUS AC GENERATOR
TYPICAL SUBMITTAL DATA

Basic Model: **431CSL6202/431PSL6202** Date: **6/15/17**

Kilowatt ratings at	1800 RPM		60 Hertz			12 Leads		
kW (kVA)	3 Phase		0.8 Power Factor			Dripproof or Open Enclosure		
	Class B	Class F				Class H		
Voltage*	80º C ① Continuous	90º C ① Lloyds	95º C ① ABS	105º C † British Standard	105º C ① Continuous	130º C ① Standby	125º C † British Standard	125º C ① Continuous	150º C ① Standby
240/480	125 (156)	131 (164)	135 (169)	142 (178)	142 (178)	155 (194)	145 (181)	151 (189)	160 (200)
230/460	125 (156)	132 (165)	136 (170)	143 (179)	143 (179)	155 (194)	145 (181)	152 (190)	160 (200)
220/440	125 (156)	132 (165)	136 (170)	143 (179)	143 (179)	153 (191)	145 (181)	151 (189)	160 (200)
208/416	125 (156)	130 (163)	133 (166)	140 (175)	140 (175)	151 (189)	141 (176)	147 (184)	155 (194)
190/380	115 (144)	120 (150)	123 (154)	130 (163)	130 (163)	140 (175)	132 (165)	135 (169)	145 (181)

① *Rise by resistance method, Mil-Std-705, Method 680.1b.* † *Rating per BS 5000.*

Submittal Data: 240/480 Volts*, 194 kVA, 1800 RPM, 60 Hz, 3 Phase

Mil-Std-705B Method	Description	Value
301.1b	Insulation Resistance	> 1.5 Meg
302.1a	High Potential Test	
	Main Stator	2000 Volts
	Main Rotor	1500 Volts
	Exciter Stator	1500 Volts
	Exciter Rotor	1500 Volts
	PMG Stator	1500 Volts**
401.1a	Stator Resistance, Line to Line	
	High Wye Connection	0.0718 Ohms
	Rotor Resistance	0.598 Ohms
	Exciter Stator	18.5 Ohms
	Exciter Rotor	0.116 Ohms
	PMG Stator	2.1 Ohms**
410.1a	No Load Exciter Field Amps at 480 Volts Line to Line	0.6 A DC
420.1a	Short Circuit Ratio	0.405
421.1a	Xd Synchronous Reactance	3.195 pu
422.1a	X2 Negative Sequence Reactance	0.268 pu
423.1a	X0 Zero Sequence Reactance	0.05 pu
425.1a	X'd Transient Reactance	0.19 pu
426.1a	X"d Subtransient Reactance	0.182 pu
--	Xq Quadrature Synchronous Reactance	1.478 pu
427.1a	T'd Transient Short Circuit Time Constant	0.048 sec.
428.1a	T"d Subtransient Short Circuit Time Constant	0.005 sec.
430.1a	T'do Transient Open Circuit Time Constant	1.34 sec.
432.1a	Ta Short Circuit Time Constant of Armature Winding	0.014 sec.

Mil-Std-705B Method	Description	Value
505.3b	Overspeed	2250 RPM
507.1c	Phase Sequence CCW-ODE	ABC
508.1c	Voltage Balance, L-L or L-N	0.2%
601.4a	L-L Harmonic Maximum - Total (Distortion Factor)	5.0%
601.4a	L-L Harmonic Maximum - Single	3.0%
601.1c	Deviation Factor	5.0%
---	TIF (1960 Weightings)	<50
652.1a	Shaft Current	< 0.1 ma
652.1a	Main Stator Capacitance to Ground	0.015 mfd

Additional Prototype Mil-Std Methods are Available on Request.

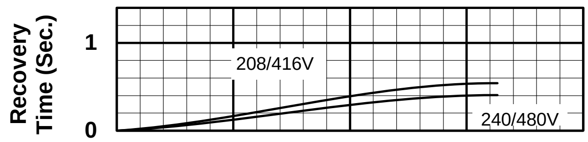
Method	Description	Value
--	Generator Frame	431
--	Type1, Brushless	
--	Insulation	Class H
--	Coupling - Single Bearing	Flexible
--	Amortisseur Windings	Full
--	Cooling Air Volume	1280 CFM
--	Exciter	Rotating
--	Voltage Regulator	SE350***
--	Voltage Regulation	1%***
--	Sensing	1 Phase***

* Voltage refers to wye (star) connection, unless otherwise specified.
**Not supplied as standard equipment.
***DVR®2000E+ voltage regulator supplied with PMG option. DVR®2000E+ voltage regulation 1/4%, 1 or 3 Phase sensing.

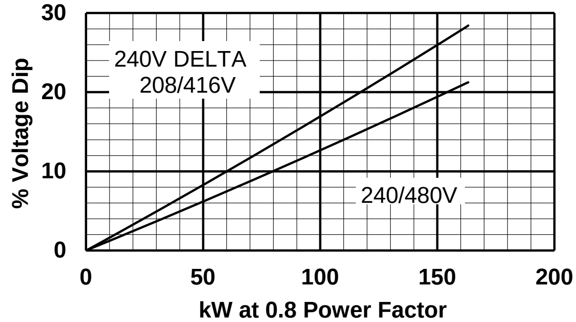
MARATHON ELECTRIC
SYNCHRONOUS AC GENERATOR
TYPICAL SUBMITTAL DATA

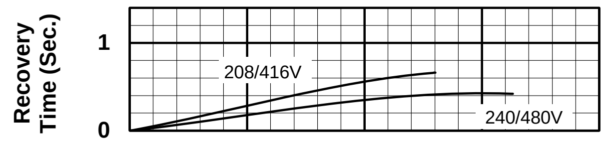
Basic Model: **431CSL6202/431PSL6202** Date: **6/27/17**

60 HERTZ

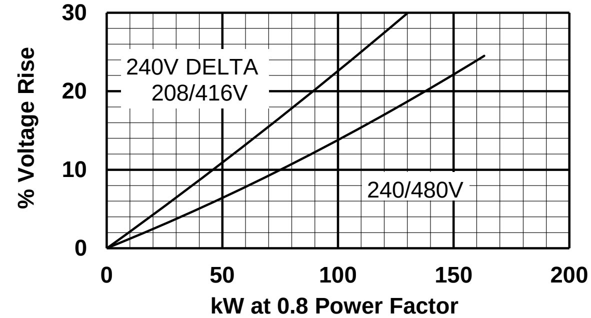


LOAD APPLICATION

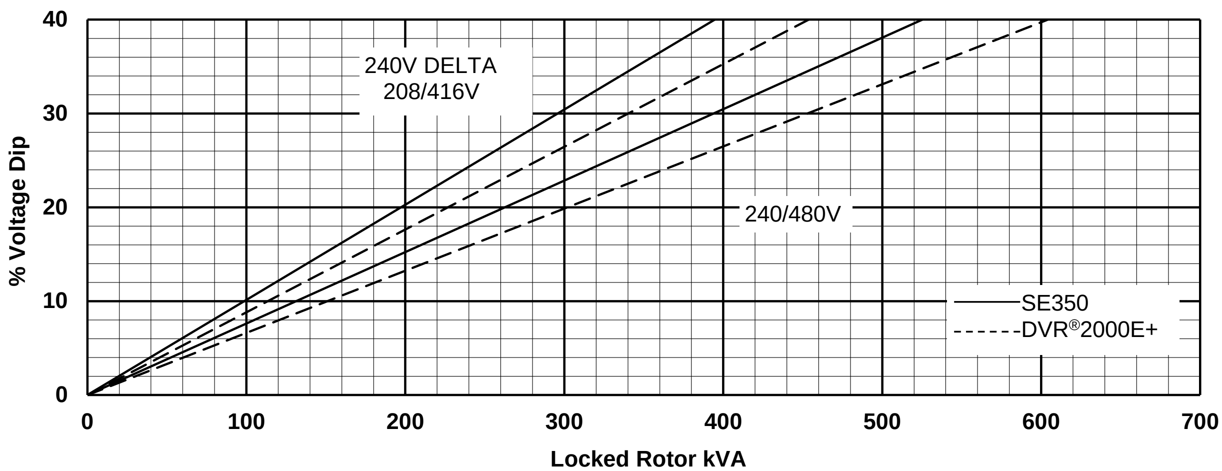




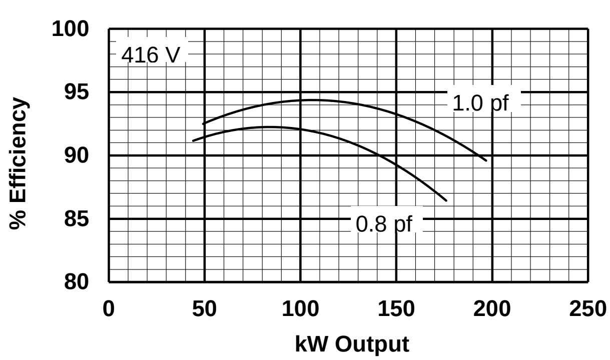
LOAD REJECTION

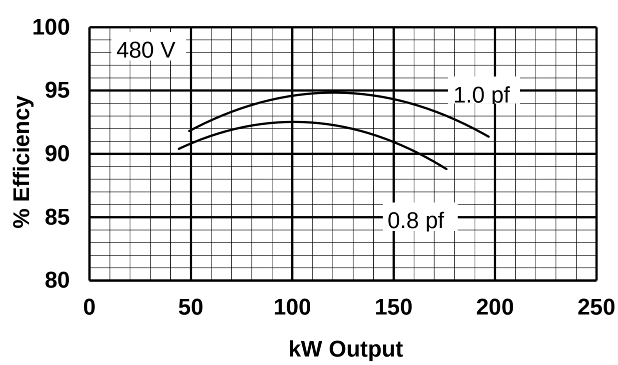


TYPICAL MOTOR STARTING CHARACTERISTICS



TYPICAL GENERATOR EFFICIENCY





Voltage refers to wye (star) connection, unless otherwise specified.

Product data sheet
Characteristics

LDL36400U33X
PowerPact L Circuit Breaker,Micrologic3.3S,400A,3P,600V,14kA

Main

Product or component type	Circuit breaker
Range of product	PowerPact L
Trip unit technology	Electronic standard Micrologic 3.3 S LSI
Breaking capacity code	D

Complementary

Protection technology	Current limiter
Line Rated Current	400 A
Poles description	3P
Breaking capacity	18 kA at 480 V AC 25 kA at 240 V AC 14 kA at 600 V AC
System Voltage	600 V AC
[Ics] rated service short-circuit breaking capacity	80 %
Mounting mode	Unit mount
Electrical connection	Lugs load Lugs line
AWG gauge	AWG 2/0...500 kcmil (aluminium/copper) 2
Terminal identifier	AL600LS52K3
Height	11.3 in
Width	5.5 in
Depth	6.61 in

Environment

Product certifications	UL listed NMX

	CCC CSA CE

Ordering and shipping details

Category	01116 - L ELEC TRIP UNIT MOUNT BREAKER/SW
Discount Schedule	DE2
GTIN	00785901954354
Nbr. of units in pkg.	1
Package weight(Lbs)	15
Returnability	Y
Country of origin	US

Offer Sustainability

Sustainable offer status	Green Premium product
RoHS (date code: YYWW)	Compliant - since 1132 - Schneider Electric declaration of conformity Schneider Electric declaration of conformity
REACh	Reference not containing SVHC above the threshold Reference not containing SVHC above the threshold
Product environmental profile	Available
Product end of life instructions	Available

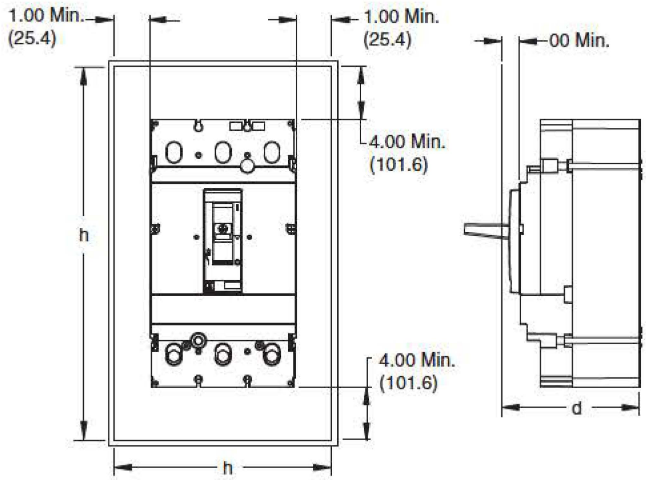
Contractual warranty

Warranty period	18 months

Circuit Breaker Enclosures and Enclosure Accessories

- Square D™ brand circuit breaker enclosures are UL Listed/CSA Certified and are suitable for use as service entrance equipment, except as footnoted.
- The short circuit rating of an enclosed circuit breaker is equal to the rating of the circuit breaker installed, except as footnoted.
- Circuit breakers are ordered and shipped separately for field installation.

Table 113: Minimum Enclosure Dimensions



Circuit Breaker	Amperage	Enclosure Dimensions (h x w x d)	
		Standard (80%)	100% Rated
HD/HG /HJ/HL	15–150 A	15.6 x 6.12 x 3.49 in. (396 x 155 x 89 mm)	15.6 x 6.12 x 3.49 in. (396 x 155 x 89 mm)
HR		18.13 x 8.63 x 4.13 in. (461 x 219 x 105 mm)	62 x 22.5 x 14 in. (1575 x 572 x 356 mm)
JD/JG/ JJ/JL[1]	150–250 A	18.72 x 6.12 x 3.49 in. (476 x 155 x 89 mm)	18.72 x 6.12 x 3.49 in. (476 x 155 x 89 mm)
JR		28.5 x 12.38 x 5.38 in. (724 x 314 x 137 mm)	62 x 22.5 x 14 in. (1575 x 572 x 356 mm)
LD/LG/ LJ/LL	250–600 A	35.48 x 12.00 x 4.45 in. 901 x 305 x 113 mm)	35.48 x 12.00 x 4.45 in. (901 x 305 x 113 mm)
LR		40.5 x 13.75 x 4.33 in. (1030 x 350 x 110 mm)	40.5 x 13.75 x 4.33 in. (1030 x 350 x 110 mm)

1 Minimum enclosure insulation required if circuit breaker side < 4.13 in. (105 mm) from metal.

Table 114: Circuit Breaker Enclosure Catalog Numbers

Circuit Breaker			Enclosure Cat. No.				
Cat. No. Prefix	Rating	Poles	NEMA 1 Flush	NEMA 1 Surface	NEMA 3R[1]	NEMA 4, 4X, 5, 3, 3R Stainless Steel	NEMA 12/3R, 5 (Without Knockouts)[2]
HDL,HGL,HJL,HLL	15–150 A	2, 3	J250F	J250S	J250R	J250DS	J250AWK
JDL,JGL,JJL,JLL	150–250 A	2, 3					
HDL	15–100 A	3	—	HD100S[3, 4, 5]	—	—	—
JDL	150–250 A	3	—	JD250S[3, 5, 6]	—	—	—

1 Enclosures with NRB or RB suffix have provisions for 3/4 in. through 2-1/2 in. bolt-on hubs in top endwall. Enclosures with R suffix have blank endwalls and require field cut opening.

2 Suitable for rainproof NEMA 3R application by removing drain screw from bottom endwall.

3 Copper wire only.

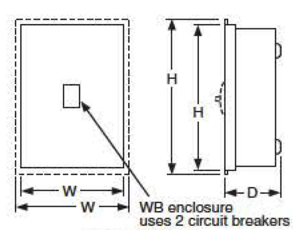
4 Maximum short circuit current rating is 25 kA, 240 Vac.

5 Order service ground kit PKOGTA2 if required.

6 Maximum short circuit current rating is 18 kA, 480 Vac.

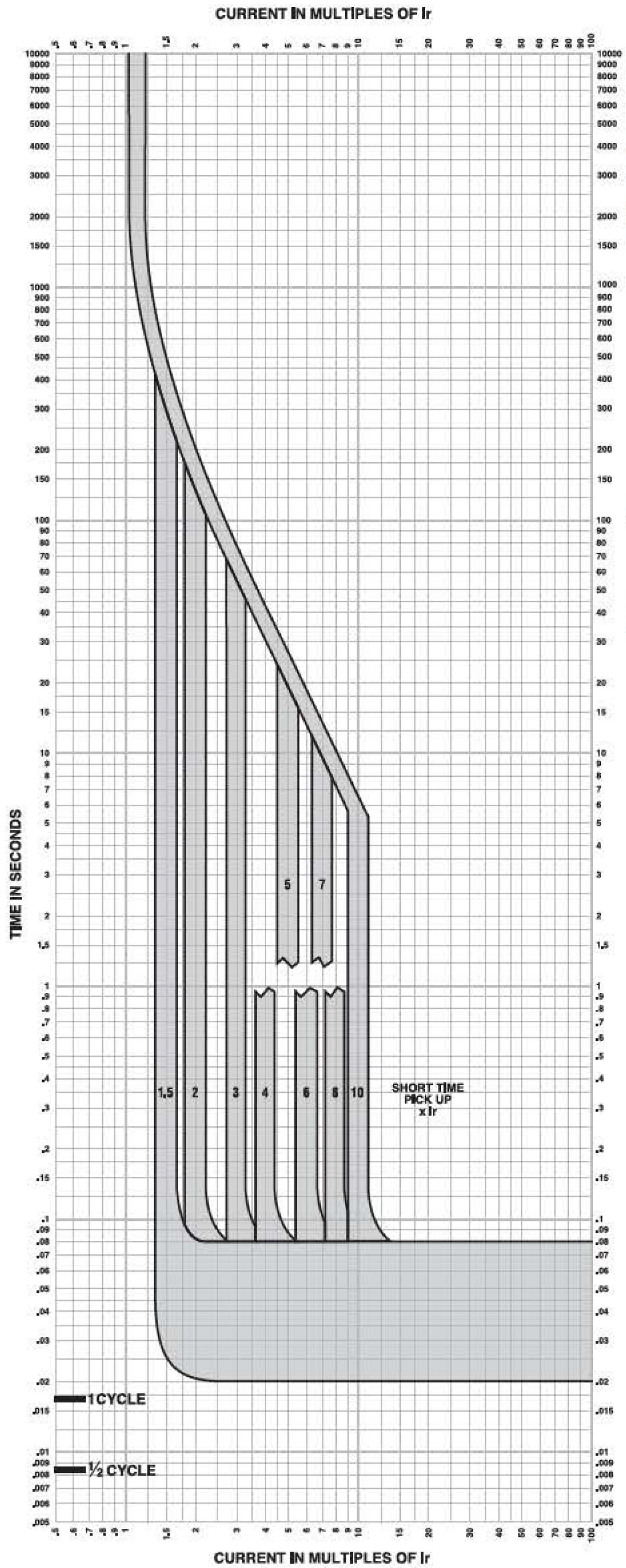
Table 115: Dimensions

Cat. No.	Approximate Dimension						
	Series	H		W		D	
HD100S	A01	17.00 in.	431.8 mm	7.90 in.	200.7 mm	4.75 in.	120.7 mm
J250F	A01	32.40 in.	823 mm	15.40 in.	391 mm	6.00 in.	152 mm
J250S	A01	31.36 in.	797 mm	14.36 in.	365 mm	6.00 in.	152 mm
J250R	A01	31.05 in.	789 mm	14.47 in.	368 mm	6.28 in.	160 mm
J250DS	A01	32.26 in.	819 mm	9.72 in.	247 mm	7.94 in.	202 mm
J250AWK	A01	32.26 in.	819 mm	9.72 in.	247 mm	7.94 in.	202 mm



NEMA Type 1

Figure 117: Micrologic 3.3S and 3.3S-W Electronic Trip Unit Long Time/Short Time Trip Curve



MICROLOGIC™ ELECTRONIC TRIP UNITS
Micrologic™ 3.3S and 3.3S-W
Long Time/Short Time Trip Curve
250A, 400A L-Frame

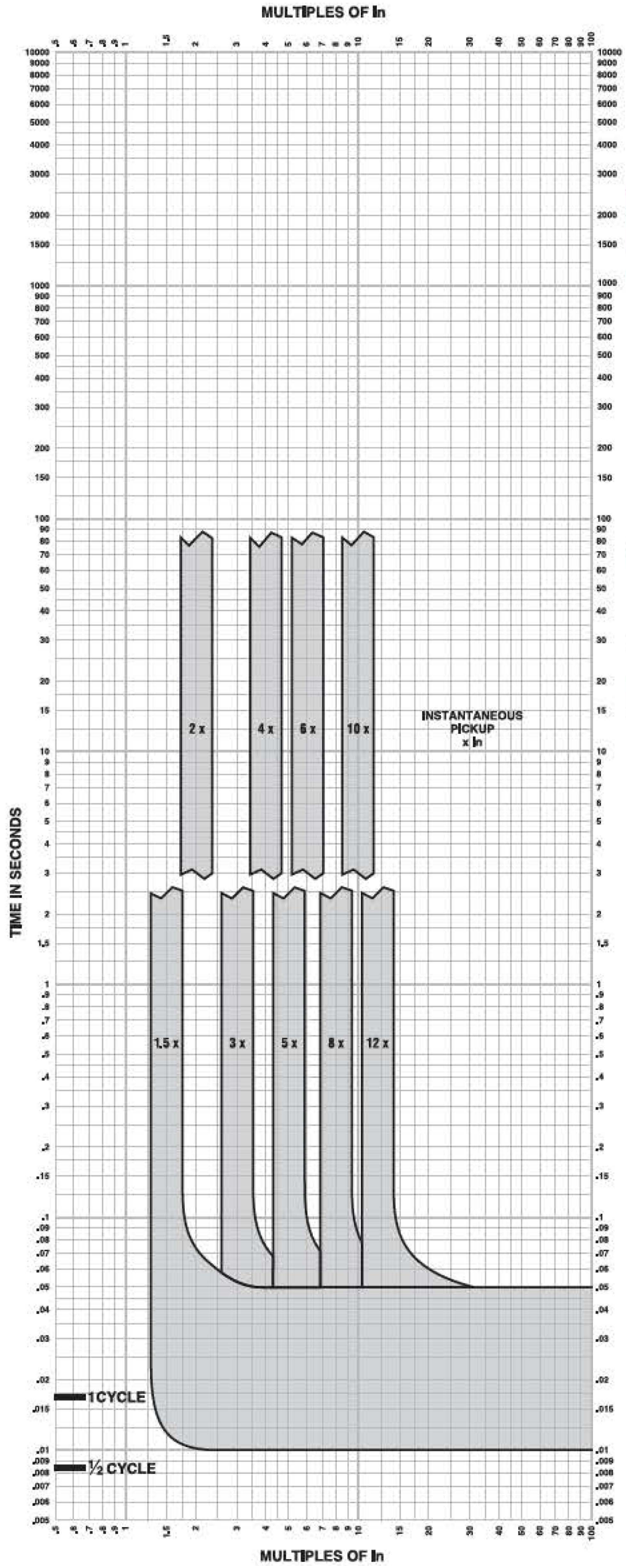
The time-current curve information is to be used for application and coordination purposes only.

Notes:

1. There is a thermal-imaging effect that can act to shorten the long-time delay. The thermal imaging effect comes into play if a current above the long-time delay pickup value exists for a time and then is cleared by the tripping of a downstream device or the circuit breaker itself. A subsequent overload will cause the circuit breaker to trip in a shorter time than normal. The amount of time delay reduction is inverse to the amount of time that has elapsed since the previous overload. Approximately 20 minutes is required between overloads to completely reset thermal-imaging.
2. Total clearing times shown include the response times of the trip unit, the circuit breaker opening, and the extinction of the current.

Curves apply from -35°C to +70°C (-31°F to +158°F) ambient temperature.

Figure 119: Micrologic 3.3, 3.3-W, 3.3S, 3.3S-W, 5.3A, 5.3A-W, 5.3E, 5.3E-W, 6.3A, 6.3A-W, 6.3E, and 6.3E-W Electronic Trip Unit Instantaneous Trip Curve



MICROLOGIC™ ELECTRONIC TRIP UNITS
Micrologic™ 3.3, 3.3-W, 3.3S, 3.3S-W, 5.3A, 5.3A-W, 5.3E, 5.3E-W, 6.3A, 6.3A-W, 6.3E, and 6.3E-W
Instantaneous Trip Curve
400A L-Frame

The time-current curve information is to be used for application and coordination purposes only.

Notes:

1. There is a thermal-imaging effect that can act to shorten the long-time delay. The thermal imaging effect comes into play if a current above the long-time delay pickup value exists for a time and then is cleared by the tripping of a downstream device or the circuit breaker itself. A subsequent overload will cause the circuit breaker to trip in a shorter time than normal. The amount of time delay reduction is inverse to the amount of time that has elapsed since the previous overload. Approximately 20 minutes is required between overloads to completely reset thermal-imaging.
2. Total clearing times shown include the response times of the trip unit, the circuit breaker opening, and the extinction of the current.
3. In = Maximum dial setting of Ir.
   400A L-Frame: In = 400A = Max Ir setting

Curves apply from -35°C to +70°C (-31°F to +158°F) ambient temperature.

Circuit Breaker Enclosure Data Sheet - Gas

150 kW Standby

DESCRIPTION

This circuit breaker enclosure data sheet is used in conjunction with dimensional drawings to assist with submittal documentation, specification requirements, and installation. This document summarizes the enclosure dimensions and mounting positions for the ***mtu*** 8V0110 GS150 circuit breakers. The dimensional drawings will govern and should be referenced for installation.

430 FRAME ENCLOSURE

- Enclosure supplied with all 430 frame alternator applications.
- Right side primary breaker shown. Left side primary breaker optional.
- Reference Figure 2 and Table 2 for breaker mounting positions.

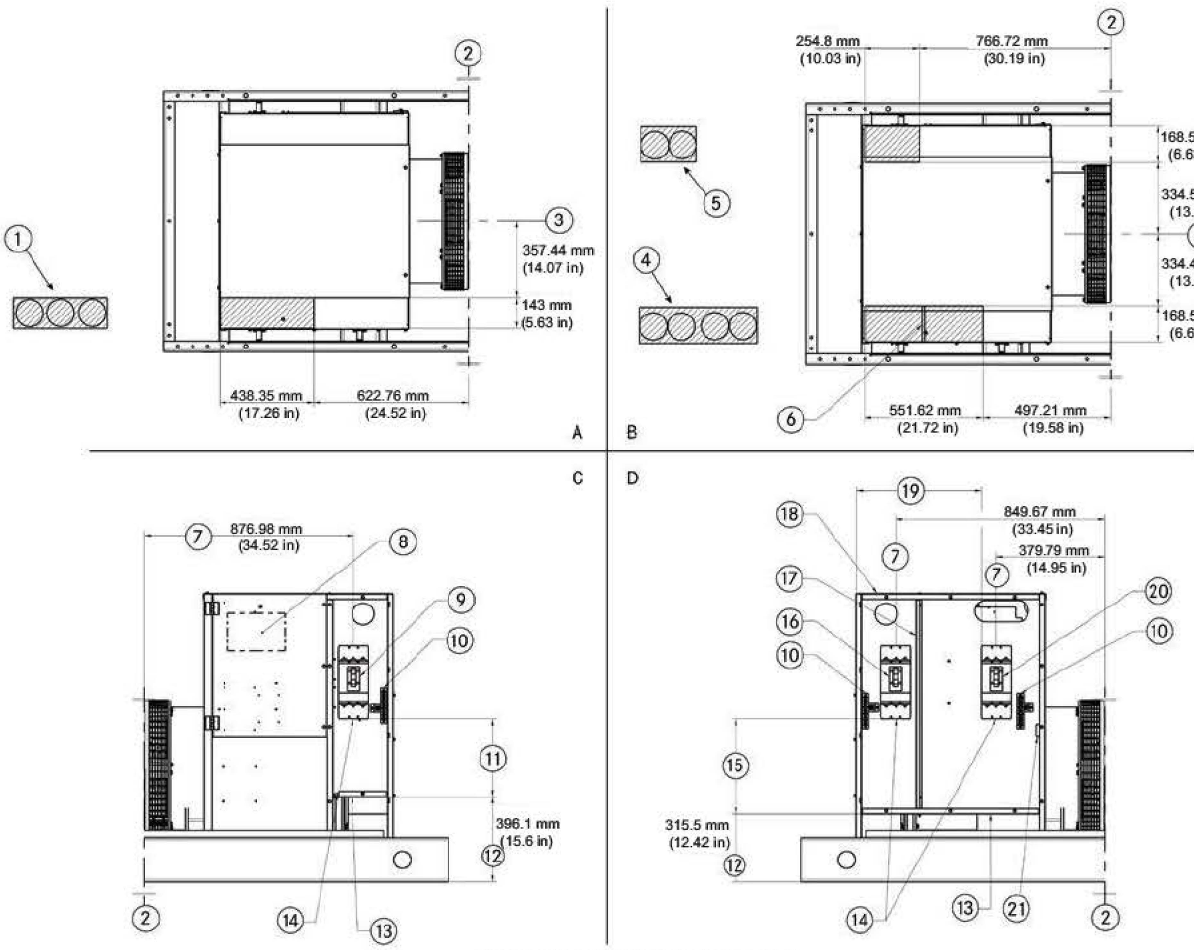


Figure 1: 430 Frame Enclosure

A. Top view, top entry conduit area
B. Top view, bottom entry conduit area
C. Left view, breaker enclosure detail (enclosure door not shown)
D. Right view, breaker enclosure detail (enclosure cover not shown)

1. Three conduit maximum
2. Rear face of flywheel housing
3. Generator centerline
4. Four conduit maximum (primary breaker side)
5. Two conduit maximum (opposite primary breaker)
6. Second breaker divider wall
7. Breaker centerline
8. Optional control panel location
9. Optional second/third breaker
10. Neutral ASM (torque to 275 in-lbs)
11. Dimension B
12. Add 205 mm (8.08 in) for bases with integrated single wall fuel tank
13. Bottom entry conduit area
14. Customer connect end (recommended torque on label)
15. Dimension A
16. Optional second breaker
17. Divider wall included with second breaker
18. Top entry conduit area
19. Dimension C
20. Primary breaker
21. Equipment ground terminal (torque to 275 in-lbs)

A Rolls-Royce solution

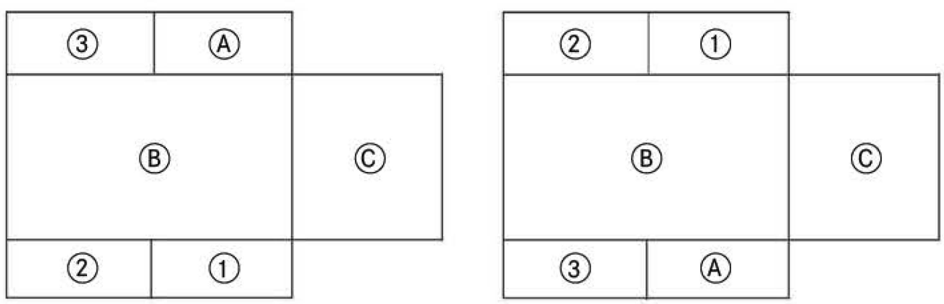
Circuit Breaker Enclosure Data Sheet - Gas
150 kW Standby

Available Circuit Breakers		Enclosure Data					
Breaker Frame	Amperage	Output Wire Range 90 °C Cu (wires per lug)	Wire Bending Space[1] Dimension A mm (in)	Wire Bending Space[1] Dimension B mm (in)	Wire Gutter Space[1,2] Dimension C mm (in)	Conduit Quantity	Conduit Size[3] in
H-Frame	20-150	(1) 8-3/0	532 (20.93)	451 (17.76)	602 (23.69)	1	2.5
J-Frame	175	(1) 4-4/0	518 (20.37)	437 (17.2)	602 (23.69)	1	2.5
J-Frame	200-250	(1) 3/0-350	518 (20.37)	437 (17.2)	602 (23.69)	1	3
L-Frame 100%	300-400	(2) 2/0-500	443 (17.44)	362 (14.27)	584 (23)	2	3.5
L-Frame 80%	300-600	(2) 2/0-500	443 (17.44)	362 (14.27)	584 (23)	2	3.5
M/P-Frame	250-800	(3) 250-500	407 (16.01)	N/A	451 (17.74)	3	3.5

(1) Meets or exceeds NFPA 70, NEC 312.6(A), and NEC 312.6(B)
(2) Top entry only available for single breaker applications
(3) Based on flexible metal conduit at 40% fill using THHN wire

NOTE: Equipment grounding terminal wire range: 6 AWG - 350 kcmil.

Table 1: 430 Frame Enclosure Data



Top View - Right Side Breaker | **Top View - Left Side Breaker**

Figure 2: 430 Frame Enclosure Breaker Mounting Positions

A. Controls
B. Outlet box
C. Alternator

1. Position 1 (Primary)
2. Position 2
3. Position 3

Breaker Frame		
Position 1 (Primary)	Position 2	Position 3
H/J/L	-	-
H/J/L	H/J/L	-
H/J/L	H/J/L	H/J/L
P/M	-	-
P/M	H/J	-
PP/MM	H/J	H/J/L
P/M	P/M	L

Table 2: 430 Frame Breaker Mounting Positions

N/A = Not Available

Attachment B Updated Permit Tables (DR AQ-11, DR LAND-3, DR VIS-7)

Updated Permit Tables

Table 1, below, lists the required permits and approvals that have been identified for the Project. The California Energy Commission (CEC) will serve as the California Environmental Quality Act (CEQA) lead agency for the Project. Other federal and state agencies with permitting authority are listed in Table 1. Certain state and local permitting is subsumed by the CEC under AB 205. A list of permits that would otherwise be required from state and local agencies, if not for AB 205, are listed in Table 2.

Table 1 Other Permits and Approvals for the Perkins Renewable Energy Project

Agency	Permit	Applicability	Timing
Federal			
BLM	Grant of Right-of-Way	For solar and storage facility construction and operation on BLM-administered land. For BAAH switchyard and 500 kV loop-in transmission lines construction and operation on BLM-administered land.	Target date of January 2025
BOR	Grant of Right-of-Way	For construction and operation of solar facility on BOR administered land. [a] For construction and operation of 500 kV loop-in transmission lines on BOR-administered land and crossing of the All-American Canal.	Concurrent with BLM Right-of-Way Grant; Target date of January 2025
U.S. Fish & Wildlife Service	Consultation form	For compliance with Section 7 of the federal Endangered Species Act under the DRECP B.O.	Target data of January 2025
State Approvals			
California Energy Commission	California Environmental Quality Act (CEQA) Lead Agency and Opt-In Certification	The CEC has been authorized under Assembly Bill (AB) 205 to provide site certification and to prepare and certify CEQA documents for eligible non-fossil-fueled power plants and related facilities. Under AB 205, CEC's authority is in lieu of and supersedes approvals that would otherwise be issued by all state and local agencies (except for those specifically carved out as having independent jurisdiction) including, but not limited to, the California Department of Fish and Wildlife, Imperial County, and the	N/a

		Imperial County Air Pollution Control District. See section below for a list of permits that would be required for the Project but for AB 205 and for which the CEC subsumes permitting authority.	
California Public Utilities Commission (CPUC)	General Order 131D Compliance, if required	500 kV loop-in transmission lines and BAAH compliance with CPUC regulations for utility-constructed infrastructure, if required.	Approximately a few months after the CEC certifies the EIR and prior to the start of construction.
Colorado River Basin Regional Water Quality Control Board	Waste Discharge Requirements (WDRs)	Regarding the treatment, storage, processing, or disposal of waste per Title 27, CCR, section 20005 et seq.	Approximately 6 months after the CEC certifies the EIR
Environmental Protection Agency (EPA); California State Water Resources Control Board (SWRCB)	NPDES Statewide General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities	Under the Porter-Cologne Water Quality Control Act ("Porter-Cologne"), the SWRCB via the RWQCBs administers California's stormwater permitting program; construction projects disturbing more than one acre of land require coverage under the General Permit for stormwater with a site-specific Stormwater Pollution Prevention Plan (SWPPP) and BMPs to manage runoff.	6 months before the start of construction (approximately June 2025) Prepare SWPPP and final notice of intent to California water board. They would issue approved notice of intent.
California Department of Transportation (Caltrans)	Encroachment Permit	For 500 kV loop-in transmission line crossing of Highway 98.	Approximately 6 months after the CEC certifies the EIR
	Transportation Permit for Oversized Loads	Obtain when necessary, 2-hour processing time (single trip) to 2 weeks (annual trip).	Approximately 6 months after the CEC certifies the EIR
	Transportation Permit	Obtain when necessary, applications can be processed in a single working day	Approximately 6 months after the CEC certifies the EIR
State Historic Preservation Officer	Consultation	Required under Section 106 to be completed by the BLM for NEPA purposes.	Included as part of the NEPA process

[a] BLM and BOR have a memorandum of understanding that allows for the BLM to issue grants of right-of-way on behalf of the BOR under certain circumstances. Either the BOR or the BLM may issue the grant of right-of-way for construction and operation of the solar facility on BOR-administered lands.

Table 2 State and Local Approvals That Would be Required But For CEC Opt-In Certification Authority under AB 205

Agency	Permit	Applicability	Timing
California Department of Fish and Wildlife (CDFW)	Lake and Streambed Alteration Agreement	For compliance with Fish and Game Code 1602 for impacts to perennial, intermittent, and ephemeral rivers, streams, and lakes in the state. CEC subsumes this authority under AB 205.	Not applicable
Imperial County	Amendment to Renewable Energy Overlay Zone Conditional Use Permit (CUP) Well permit (conditioned as part of CUP)	To allow renewable energy development per Imperial County General Plan and zoning code For construction and operation of solar and storage facility on private lands including any zoning changes. For construction and operation of up to four groundwater wells.	Not applicable
Imperial County Public Health Department Division of Environmental Health	Septic System Permit	For construction and operation of a septic system.	Not applicable
Imperial County Air Pollution Control District (APCD)[(a)]	Indirect Source Review	An Indirect Source Review (District Rule 9510) is required to determine potential mitigation, if any, for oxides of nitrogen (NOx) and particulate matter less than or equal to 10 microns in diameter (PM_{10}) emissions.	Not applicable
Imperial County APCD[(b)]	Dust Control Plan	A dust control plan is required to be prepared and submitted for approval under ICAPCD rule 801 prior to initiation of ground disturbing activities associated with construction. Dust control requirements of ICAPCD Rules 800 and 805 also apply.	Not applicable
Imperial County APCD	Authority to Construct and Permit to Operate	Facility backup generator permits for Project operations, if required.	Not applicable
Imperial County CUPA	Hazardous Materials Business Plan, if needed	Submittal at least 30 days prior to operation if needed based on amount of hazardous materials used; submitted through California Environmental Reporting System (CERS).	Not applicable

Imperial County	Spill Prevention, Control, and Countermeasure (SPCC Plan)	Submittal at least 30 days prior to operation; submitted through CERS.	Not applicable

Note:

[a] CEQA Air Quality Handbook. Imperial County Air Pollution Control District's (ICAPCD) California Environmental Quality Act (CEQA) Air Quality Handbook provides guidance to lead agencies, planning consultants, ICAPCD staff, and project proponents in assessing the potential air quality impacts from residential and commercial developments.

[b] Per meeting notes from May 1, 2024, it was the opinion of the APCD that the CEC does not have the authority to issue permits on behalf of the APCD or the Dust Control Plan.

Attachment C Updated Cumulative Projects Tables and Figures (DR LAND-2, DR LAND-3, DR PD-4, DR PD-5)

ATTACHMENT C

Table 1 Cumulative Projects within 6 Miles

No.	Project name	Permit type and Record No.	Project type	Applicant	Location	Phase	Approximate distance from the Project Application Area
1	Ormesa Conduit Improvement Project[a]	Not available	Geothermal	Ormat	Imperial County	In progress: analysis and document preparation	2.90 miles northwest
6	Vikings Solar Energy Generation and Battery Storage Project[a]	Conditional Use Permit (CUP20-0025)/ Initial Study (IS20-0035)	Solar	Imperial County	Imperial County	Pending entitlement	4.5 miles northwest
31	Ormesa 2[a]	Not available	Geothermal	Ormat	Imperial County	Operational	2.85 miles northwest
33	Gem 1[a]	Not available	Geothermal	Ormat	Imperial County	Operational	2.95 miles northwest
47	Ormesa 1E[a]	Not available	Geothermal	Ormat	Imperial County	Operational	4.0 miles northwest
48	Ormesa I[a]	Not available	Geothermal	Ormat	Imperial County	Operational	4.8 miles northwest
51	Gem 2[a]	Not available	Geothermal	CalEnergy	Imperial County	Operational	2.95 miles northwest
54	Union Pacific Railroad Communication Facility	CACA 042127	Communication facility	Union Pacific Railroad	Imperial County	Operational	Adjacent Project site
55	IID 161 kV Transmission Line	CARI 000140	Transmission line	Imperial Irrigation District	Imperial County	Operational	Adjacent Project site
56	IID 92 kV Transmission Line & Distribution Line	Not available	Transmission line	Imperial Irrigation District	Imperial County	Operational	Adjacent Project site

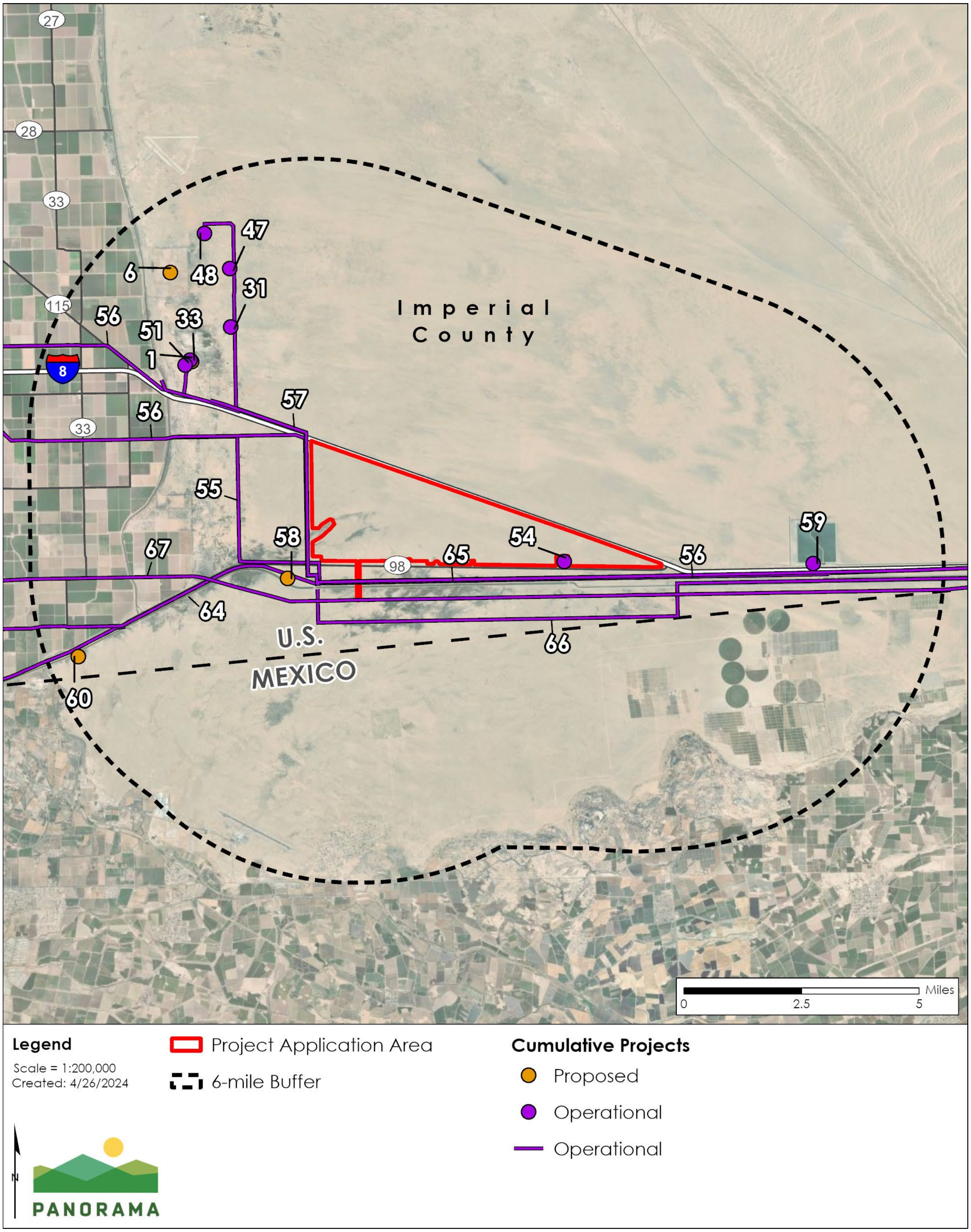
57	Fiber Optic Line	CACA 041192	Fiber optic line	Level Three Communications	Imperial County	Operational	Adjacent Project site
58	North Gila-Imperial Valley 500 kV Transmission Project	Not available	Transmission line	NGIV2, LLC	Imperial County	Proposed	0.06 mile south
59	IID Brock Reservoir	Not available	Reservoir	Imperial Irrigation District	Imperial County	Operational	3.15 miles east
60	VEGA SES 4 Solar Energy Project[a]	Conditional Use Permit (CUP17-0001)	Solar	Imperial County	Imperial County	Pending entitlement	4.0 miles southwest
64	IID 92 kV Transmission Line	Not available	Transmission line	Imperial Irrigation District	Imperial County	Operational	0.5 mile southwest
65	IID 92 kV Transmission Line	Not available	Transmission line	Imperial Irrigation District	Imperial County	Operational	0.4 mile south
66	IID 92 kV Transmission Line	Not available	Transmission line	Imperial Irrigation District	Imperial County	Operational	0.6 mile south
67	Southwest Power Link 500 kV Transmission Line	Not available	Transmission Line	San Diego Gas and Electric	Imperial County	Operational	0.84 mile south

Note:

[a] Projects are also within Imperial County.

Source: (BLM, n.d.), (IP Perkins 2023), (Imperial County Planning & Development Services, n.d.)

Figure 1 Cumulative Projects within a 6-mile Radius



ATTACHMENT C

Table 2 Cumulative Renewable Projects within Imperial County

No.	Project name	Permit Type and Record No.	Project type	Applicant	Location	Phase	Approximate distance to the Project Application Area
1	Ormesa Conduit Improvement Project	Not available	Geothermal	Ormat	Imperial County	In Progress - Analysis & Document Preparation	2.90 miles northwest
2	Citizens Imperial Solar, LLC Project	Conditional Use Permit (CUP18-0006)/ Initial Study (IS18-0003)	Solar	Imperial County	Imperial County	Operational	32.64 miles northwest
3	Seville Solar	Not available	Solar	Imperial County	Imperial County	Operational	50.70 miles northwest
4	Wister Solar Energy	General Plan Amendment (GPA19-0001)/ Rezone (ZC19-0001)/ Conditional Use Permit (CUP18-0040, CUP20-0006)	Solar	Imperial County	Imperial County	Pending entitlement	40.75 miles west
5	Orni 30 LLC CUP	General Plan Amendment (GPA21-0003)/ Rezone (ZC21-0003)/ Conditional Use Permit (CUP20-0030)	Solar	Imperial County	Imperial County	Pending entitlement	25.5 miles northwest
6	Vikings Solar Energy Generation and Battery Storage Project	Conditional Use Permit (CUP20-0025)/ Initial Study (IS20-0035)	Solar	Imperial County	Imperial County	Pending entitlement	4.5 miles northwest
7	Mount Signal and Calexico Solar Farm Projects	Conditional Use Permits (CUP10-0031, CUP11-0009, CUP11-0010, CUP11-0011,	Solar	Imperial County	Imperial County	Operational	24 miles southwest

ATTACHMENT C

No.	Project name	Permit Type and Record No.	Project type	Applicant	Location	Phase	Approximate distance to the Project Application Area
		CUP11-0012)/ Variance (VAR11-0006)					
8	VEGA SES Solar Energy Project	Conditional Use Permit (CUP20-0020)	Solar	Imperial County	Imperial County	Approved: not built	27.63 miles west
9	Alhambra Solar	Conditional Use Permit (CUP11-0018)	Solar	Imperial County	Imperial County	Operational	27 miles northwest
10	Arkansas Solar	Conditional Use Permit (CUP11-0020)	Solar	Imperial County	Imperial County	Operational	30.5 miles northwest
11	Calipatria Solar Farm II	Conditional Use Permit (CUP10-0035)	Solar	Imperial County	Imperial County	Operational	32 miles northwest
12	Campo Verde	Conditional Use Permit (CUP11-0007)	Solar	Imperial County	Imperial County	Operational	28.20 miles west
13	Centinela Solar	Conditional Use Permit (CUP10-0017)	Solar	Imperial County	Imperial County	Operational	25.30 miles west
14	Imperial Solar South	Conditional Use Permit	Solar	Imperial County	Imperial County	Operational	25.20 miles southwest
15	Imperial Solar West	Conditional Use Permit (CUP-10-0012); Variance (V10-0007)	Solar	Imperial County	Imperial County	Operational	32.60 miles west
16	Imperial Valley Solar II	Not available	Solar	Imperial County	Imperial County	Operational	38 miles northwest
17	IV Solar Company	Conditional Use Permit (CUP10-0014)	Solar	Imperial County	Imperial County	Operational	38 miles northwest

ATTACHMENT C

No.	Project name	Permit Type and Record No.	Project type	Applicant	Location	Phase	Approximate distance to the Project Application Area
18	Midway Solar Farm I-IV	Conditional Use Permit (CUP17-0011 thru CUP17-0014)	Solar	Imperial County	Imperial County	Operational	34.60 miles northwest
19	Sonora Solar	Conditional Use Permit (CUP11-0021)	Solar	Imperial County	Imperial County	Operational	32 miles northwest
20	Calipatria Solar Farm I (Wilkinson Solar)	Conditional Use Permit (CUP18-0024, formerly CUP13-0031)	Solar	Imperial County	Imperial County	Approved: not built	31 miles northwest
21	Laurel Cluster Solar Farms	General Plan Amendment (GPA17-0003)/ Rezone (ZC17-0002)/ Conditional Use Permits (CUP17-0027 thru CUP17-0030)/ Variances (V13-0003 thru 18-0006)	Solar	CA DWR and 8minute Solar Energy	Imperial County	Approved: not built	28 miles west
22	Nider Solar Project	General Plan Amendment (GPA17-0004)	Solar	Imperial County	Imperial County	Pending entitlement	32 miles northwest
23	Drew Solar Project	General Plan Amendment (GPA17-0006)/ Rezone (ZC17-0007)/ Conditional Use Permits (CUP17-0031 thru CUP17-0034, CUP18-0001)/ Variance (V17-0003)/ Initial Study (IS17-0035)	Solar	Imperial County	Imperial County	Approved: under construction	25.50 miles west

ATTACHMENT C

No.	Project name	Permit Type and Record No.	Project type	Applicant	Location	Phase	Approximate distance to the Project Application Area
24	Iris Cluster Solar Farm Project	Conditional Use Permits, Variances, Williamson Act Cancellations	Solar	Imperial County	Imperial County	Approved: not built	22.80 miles west
25	Wistaria Ranch Solar	Conditional Use Permits (CUP13-0036 thru CUP13-0052)	Solar	Imperial County	Imperial County	Approved: not built	22.70 miles west
26	CED Westside Canal Battery Storage	General Plan Amendment (GPA19-0003)/ Conditional Use Permits (CUP19-0004, CUP19-0005)/ Initial Study (IS19-0018)	Battery Storage	Imperial County	Imperial County	Pending Entitlement	28.70 miles west
27	Le Conte Battery Storage	Conditional Use Permit (CUP18-0018)	Battery Storage	Imperial County	Imperial County	Pending Entitlement	25.50 miles southwest
28	VEGA SES 6 Solar Energy Project	General Plan Amendment (GPA0001)/ Rezone (ZC22-0001)/ Conditional Use Permit (CUP22-0005)/ Initial Study (IS22-0007)	Solar	Imperial County	Imperial County	Pending entitlement	32.75 miles northwest
29	Desert Valley Company (DVC) Monofill Expansion Project	General Plan Amendment (GPA18-0004)/ Rezone (ZC18-0005)/ Conditional use Permit (CUP18-0025)	Geothermal	Imperial County	Imperial County	Pending entitlement	42 miles northwest
30	Orni 19	Conditional Use Permit (CUP08-0023)	Geothermal	Ormat	Imperial County	Approved	25 miles northwest
31	Ormesa 2	Not available	Geothermal	Ormat	Imperial County	Operational	2.85 miles northwest

ATTACHMENT C

No.	Project name	Permit Type and Record No.	Project type	Applicant	Location	Phase	Approximate distance to the Project Application Area
32	Orni 18	Conditional Use Permit (CUP07-0017)	Geothermal	Ormat	Imperial County	Operational	26 miles northwest
33	Gem 1	Not available	Geothermal	Ormat	Imperial County	Operational	2.95 miles northwest
34	Hudson Ranch II	Conditional Use Permit (CUP10-0002)	Geothermal	Energy Source	Imperial County	Approved	36.81 miles northwest
35	Cal Energy Unit 5	Not available	Geothermal	CalEnergy	Imperial County	Operational	37.10 miles northwest
36	Cal Energy Unit 3	Not available	Geothermal	CalEnergy	Imperial County	Operational	37.05 miles northwest
37	Vulcan	Not available	Geothermal	CalEnergy	Imperial County	Operational	37.0 miles northwest
38	J.M. Leathers	Not available	Geothermal	CalEnergy	Imperial County	Operational	36.70 miles northwest
39	SIGC	Not available	Geothermal	Ormat	Imperial County	Operational	16.8 miles west
40	Heber Geothermal Company	Not available	Geothermal	Ormat	Imperial County	Operational	16.9 miles west
41	Black Rock Units 1, 2 & 3	Not available	Geothermal	Ormat	Imperial County	Approved	37.50 miles northwest
42	Cal Energy Unit 1 and 2	Not available	Geothermal	CalEnergy	Imperial County	Operational	37.85 miles northwest
43	J.J. Elmore	Not available	Geothermal	CalEnergy	Imperial County	Operational	37.80 miles northwest
44	Del Ranch	Not available	Geothermal	CalEnergy	Imperial County	Operational	37.0 miles northwest

ATTACHMENT C

No.	Project name	Permit Type and Record No.	Project type	Applicant	Location	Phase	Approximate distance to the Project Application Area
45	Goulds I	Not available	Geothermal	Ormat	Imperial County	Operational	16.9 miles west
46	Hudson Ranch I	Conditional Use Permit (CUP22-0020)/ Initial Study (IS22-0034)	Geothermal	Energy Source	Imperial County	Operational	36.81 miles northwest
47	Ormesa 1E	Not available	Geothermal	Ormat	Imperial County	Operational	4.0 miles northwest
48	Ormesa I	Not available	Geothermal	Ormat	Imperial County	Operational	4.8 miles northwest
49	Wister	Not available	Geothermal	Orni 21	Imperial County	Proposed/under construction	40.90 miles west
50	Turbo	Not available	Geothermal	CalEnergy	Imperial County	Operational	37.0 miles northwest
51	Gem 2	Not available	Geothermal	CalEnergy	Imperial County	Operational	2.95 miles northwest
52	Heber South	Not available	Geothermal	N/A	Imperial County	N/A	18.12 miles west
53	Cal Energy Unit 4	Not available	Geothermal	CalEnergy	Imperial County	Operational	37.05 miles northwest
60	VEGA SES 4 Solar Energy Project	Conditional Use Permit (CUP17-0001)	Solar	Imperial County	Imperial County	Pending entitlement	4.0 miles southwest
61	Titan Solar/Seville 4 Solar Project	General Plan Amendment (GPA17-0002)/ Rezone (ZC17-0001)/ Conditional Use Permits (CUP17-0006, CUP13-0012, CUP13-0013)	Solar	Imperial County	Imperial County	Pending entitlement	51.60 miles northwest

ATTACHMENT C

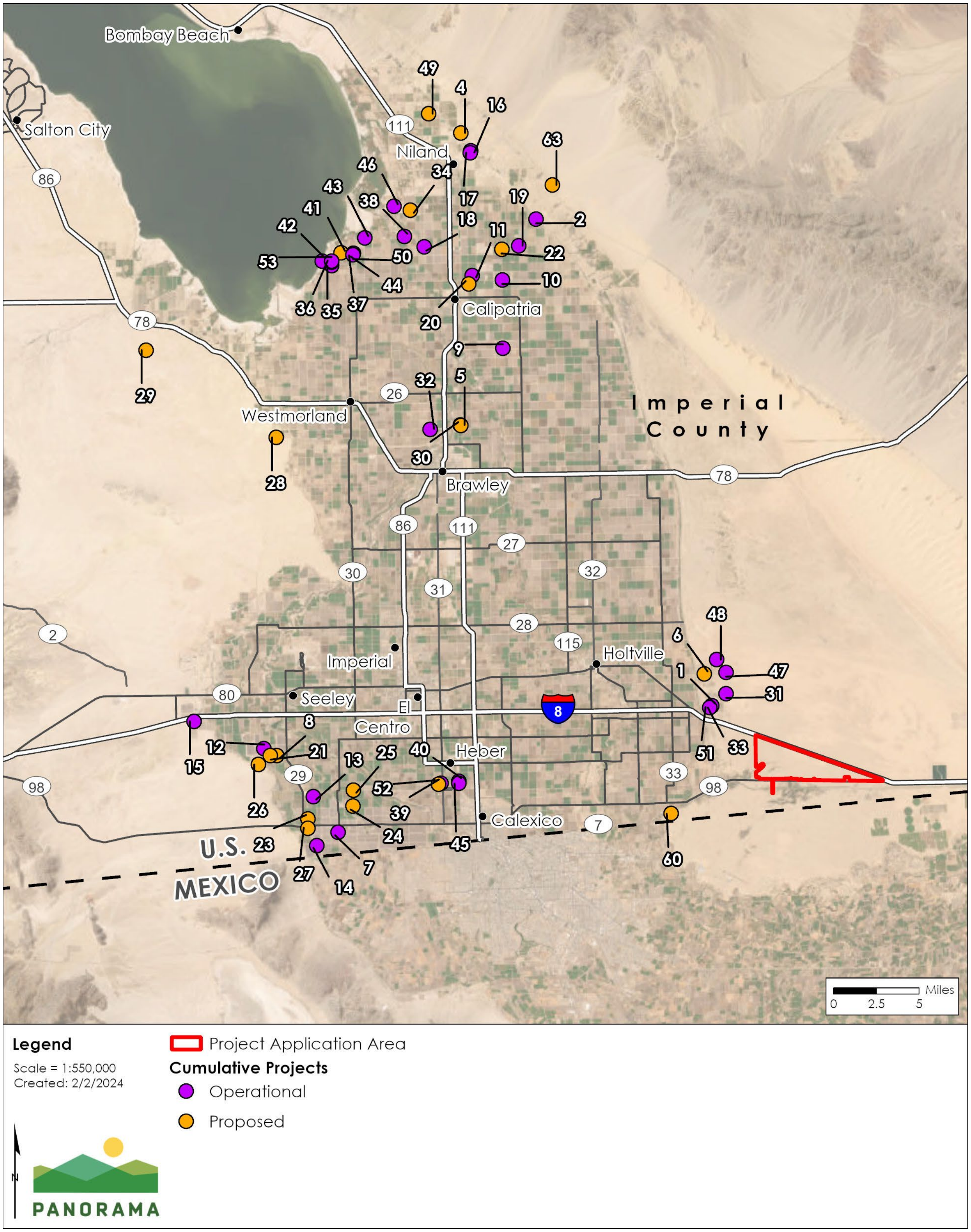
No.	Project name	Permit Type and Record No.	Project type	Applicant	Location	Phase	Approximate distance to the Project Application Area
62	Truckhaven Seismic Exploration	General Plan Amendment (GPA22-0003)/ Rezone (ZC22-0004)	Geothermal	ORNI 5 LLC	Thermal, Imperial County	In progress: decision and appeal	55.77 miles northwest
63	VEGA SES 2, 3, & 5 Solar Energy Project	Conditional Use Permits (CUP20-0021, CUP20-0022, CUP20-0023)	Solar	Imperial County	Imperial County	Pending entitlement	34.75 miles northwest

Note:

[a] Project numbers 54 through 59 are not within Imperial County but are within a 6-mile radius of the Project Application Area.

Source: (BLM, n.d.), (Imperial County Planning & Development Services, n.d.)

Figure 2 Cumulative Renewable Projects within Imperial County



Attachment D Updated Laws, Ordinances, Regulations, and Standards Compliance Tables for Land Use (DR LAND-5)

ATTACHMENT D

Table 1 Federal Laws, Ordinances, Regulations and Standards Applicable to Land Use

LORS	Applicability	Compliance	Opt-In Application Reference
Federal Aviation Administration Title 14 Code of Regulations part 77.9	Requires that all structures exceeding Title 14 Code of Federal Regulations [CFR] part 77.9 notice criteria be submitted to the FAA so that an aeronautical study can be conducted	The Project would comply with Federal Aviation Administration Title 14 Code of Regulations part 77.9.	Chapter 2.0, Project Description; Section 4.13, Visual Resources
Desert Renewable Energy Conservation Plan, Land Use Plan Amendment to the California Desert Conservation Area Plan	The purpose of the DRECP is to conserve and manage plant and wildlife communities in the desert regions of California while facilitating the timely permitting of compatible renewable energy projects.	The Project would comply with the DRECP Land Use Plan Amendments.	All Sections of Opt-in Application; Appendix D.1 and D.2

Table 2 State Laws, Ordinances, Regulations and Standards Applicable to Land Use

LORS	Applicability	Compliance	Opt-In Application Reference
Warren-Alquist Act	Public Resources Code section 25545 et seq. authorizes the CEC to certify the siting and development of renewable energy facilities. Under AB 205, the CEC is the lead CEQA agency for environmental review for any facility that elects to opt into the CEC's jurisdiction. CEQA is codified in the California PRC, sections 21000-21178.1.	The Project would adhere to the requirements of the Warren-Alquist Act.	All sections of Opt-In Application; Chapter 3, Engineering; Section 4.4: Geologic Hazards and Resources; 4.17: Worker Safety

Table 3 Local Laws, Ordinances, Regulations and Standards Applicable to Land Use

LORS	Applicability	Compliance	Opt-In Application Reference
Imperial County General Plan: Agricultural Element, Goal 1 – All Important Farmland, including the categories of Prime Farmland, Farmland of Statewide	A comprehensive guide for land use and development within Imperial County	The Project would conform with the Imperial County General Plan by complying with	Section 4.6: Land Use, Impact LU-2

Importance, Unique Farmland, and Farmland of Local Importance, as defined by Federal and State agencies, should be reserved for agricultural uses. Agricultural Element, Goal 3: Limit the introduction of conflicting uses into farming areas, including residential development of existing parcels which may create the potential for conflict with continued agricultural use of adjacent property. Land Use Element, Goal 1: Preserve commercial agriculture as a prime economic force. Land Use Element, Goal 2: Diversify employment and economic opportunities in the County while preserving agricultural activity. Land Use Element, Goal 3: Achieve balanced economic and residential growth while preserving the unique natural, scenic, and agricultural resources of Imperial County. Land Use Element, Goal 6: Promote orderly industrial development with suitable and adequately distributed industrial land. Land Use Element, Goal 8: Coordinate local land use planning activities among all local jurisdictions and state and federal agencies among all local jurisdictions and state and federal agencies. Open Space and Conservation Element, Goal 1: Environmental resources shall be conserved for future generations by minimizing environmental impacts in all land use decisions and educating the public on their value. Open Space and Conservation Element, Goal 8: Open space shall be maintained to protect the aesthetic character of the region, protect natural resources, provide recreational opportunities, and minimize hazards to human activity. Renewable Energy and Transmission Element, Renewable Energy Overlay Zone		applicable local laws and regulations and implementing BMPs and CMAs, see Table 4.6-2 for additional details on project consistency with applicable General Plan policies.	
Imperial County Code of Ordinances, Title 9 Land Use Code, Division 5 – Zoning Areas Established, Chapter 19 – S-2 (Open Space/Preservation)	Designates land use zones and their intended use and development	• The Project is a major facility relating to the generation and transmission of	Section 4.6: Land Use, addressed in this table

• 90519.02 – Uses permitted with a conditional use permit: Major facilities relating to the generation and transmission of electrical energy • 90519.04 – Minimum lot size: 20 acres (net) • 90519.06 – Yard and setbacks – Front yard setback: 30 feet minimum from property line or 80 feet from center line of adjacent road – Side yard setback: 20 feet minimum from property line – Rear yard setback: 20 feet minimum from property line • 90519.07 – Height limit: 40 feet maximum, except for communication towers: 100 feet. 90519.09 – Parking: off-street parking per Sections 90402.00 through 90402.15	requirements within Imperial County	renewable energy, allowed in this zone with approval of a CUP • Project facilities would be setback at a minimum of 100 feet from all property lines (see below regarding lot mergers). • Tallest component on private land would be the solar panels at a maximum height of 10 feet at full tilt depending on topography and hydrology. Off-street parking has been incorporated into the design and would meet parking requirements.	
Imperial County Code of Ordinances, Title 9 Land Use Code, Division 17 – Renewable Energy Resources	Designates areas subject to the Renewable/Geothermal overlay zone for development of renewable energy facilities	The private land portion of the Project is not located within the overlay, but was identified as a non-exclusion area for solar in the CEC land use screens and was included as a preferred area for solar the Preferred Alternative in the DRECP Draft EIR/EIS.	Section 4.6: Land Use, Impact LU-2
Imperial County Code of Ordinances, Title 9 Land Use Code, Division 8 – Subdivisions, Chapter 8 – Lot Mergers Initiated by Property Owner	Allows for lot mergers by owners and describes process for completing lot mergers	Applicant would merge the 6 private lots in conformance with the Subdivision Map Act requirements.	Section 4.6: Land Use, Impact LU-2

Attachment E Correspondence with BLM Regarding Tamarisk Long Term Visitation Area (DR NOISE-1)

Gmail **Emily Capello <emily.capello@panoramaenv.com>**

Fw: [EXTERNAL] Tamarisk LTVA Usage

Camille Wasinger <camille@intersectpower.com> Mon, Jan 22, 2024 at 12:57 PM
To: Emily Capello <emily.capello@panoramaenv.com>, Susanne Heim <susanne.heim@panoramaenv.com>
Cc: Jennifer Savois <jenna.savois@panoramaenv.com>, Logan Nonnez <Logan.Nonnez@intersectpower.com>

Hi Pano Team,

See below from BLM on the Tamarisk LTVA - good news!

Best,
Camille

:::
Camille Wasinger
Senior Director, Environmental & Permitting
INTERSECT POWER
(c) 303.909.6396
(e) camille@intersectpower.com
www.linkedin.com/in/camillewasinger

Intersect Power

From: Sahagun, Carrie L <csahagun@blm.gov>
Sent: Monday, January 22, 2024 1:52 PM
To: Toedtli, Matthew R <mtoedtli@blm.gov>; Logan Nonnez <Logan.Nonnez@intersectpower.com>; Rodriguez Sanchez, Christian M <crodriguezsanchez@blm.gov>
Cc: Camille Wasinger <camille@intersectpower.com>; Vida Strong <VStrong@aspeneg.com>; John Kalish <JKalish@aspeneg.com>; Riddell, Tristan T <triddell@blm.gov>
Subject: Re: [EXTERNAL] Tamarisk LTVA Usage

Hi all,
We have unofficially closed that LTVA site due to lack of use.
-Carrie

Carrie L. Sahagun
Associate Field Manager
BLM El Centro Field Office
1661 S. 4th Street
El Centro, CA 92243
(760) 337-4437
USDI, Region 8
she/her

From: Toedtli, Matthew R <mtoedtli@blm.gov>
Sent: Monday, January 22, 2024 12:08 PM
To: Logan Nonnez <Logan.Nonnez@intersectpower.com>; Rodriguez Sanchez, Christian M <crodriguezsanchez@blm.gov>
Cc: Camille Wasinger <camille@intersectpower.com>; Vida Strong <VStrong@aspeneg.com>; John Kalish <JKalish@aspeneg.com>; Riddell, Tristan T <triddell@blm.gov>; Sahagun, Carrie L <csahagun@blm.gov>
Subject: Re: [EXTERNAL] Tamarisk LTVA Usage

Hi Logan,

Thanks for reaching out.

Can you work with Christian on who could best answer this question and continue to CC John?

Thanks all.

Matt Toedtli
Assistant District Manager (Detailed)
Project Support Team
Bureau of Land Management, California Desert District
U.S. Department of the Interior, Regions 8 & 10
Ph: (760) 833-7153

From: Logan Nonnez <Logan.Nonnez@intersectpower.com>
Sent: Monday, January 22, 2024 11:41 AM
To: Toedtli, Matthew R <mtoedtli@blm.gov>
Cc: Camille Wasinger <camille@intersectpower.com>; Vida Strong <VStrong@aspeneg.com>
Subject: [EXTERNAL] Tamarisk LTVA Usage

Hi Matt, hope you're well. As we are working to evaluate the noise impacts of project, it would be great to better understand the usage of Tamarisk LTVA (BLM Tamarisk Long Term Visitors Area) just south of the Perkins site. We have not been able to track down any usage data online or in the DRECP LTVA Use Plan. Does the BLM have any information internally on the usage of this visitor's area? Let us know, thank you!

Best,

Logan Nonnez
Specialist, Environmental & Permitting

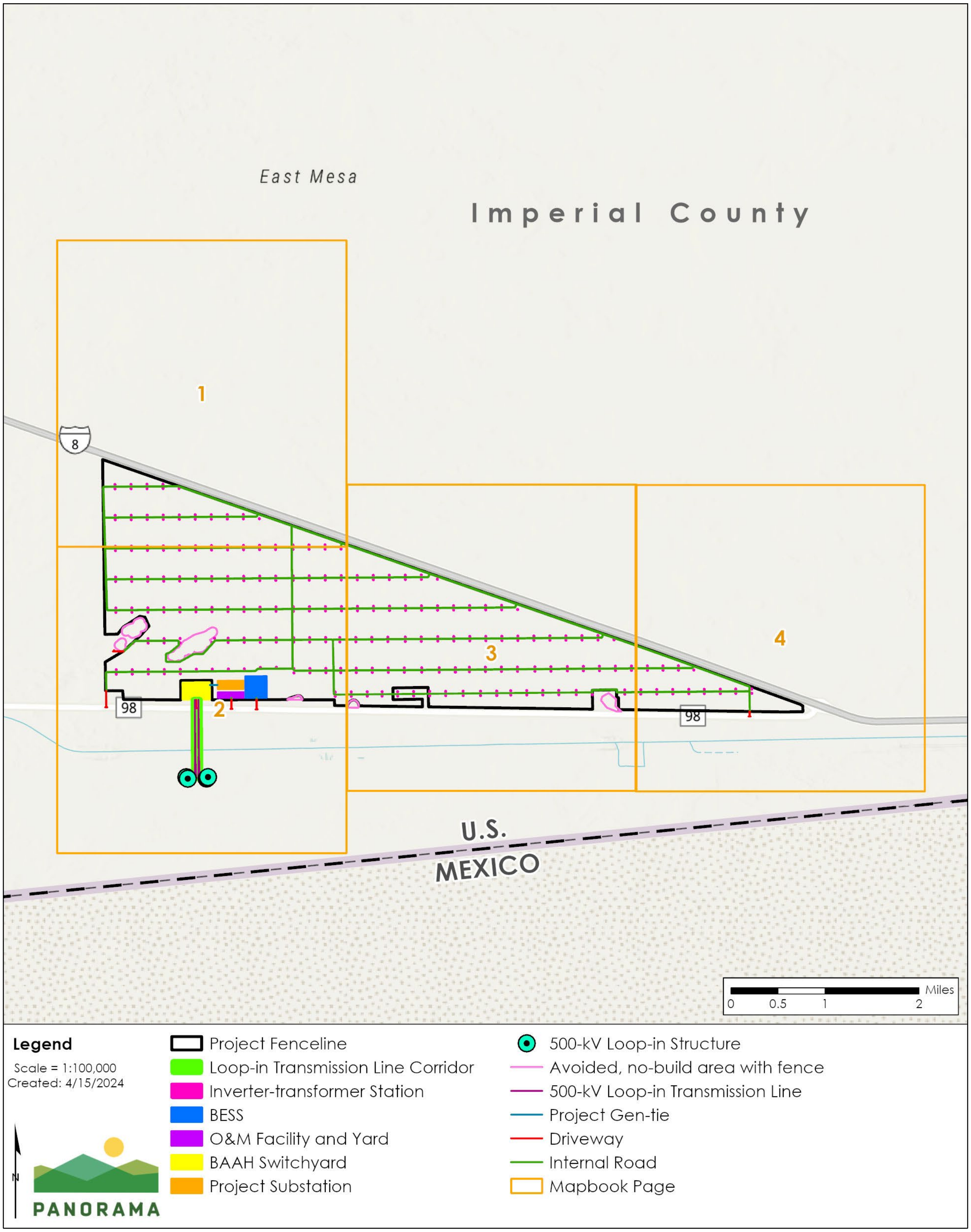
INTERSECT POWER
(c) 5138850372
(e) logan.nonnez@intersectpower.com
linkedin.com/in/logan-nonnez/

Attachment F Updated Project Figures (DR PD-4)

Attachment F.1 Updated Legal Land Description Figures

ATTACHMENT F

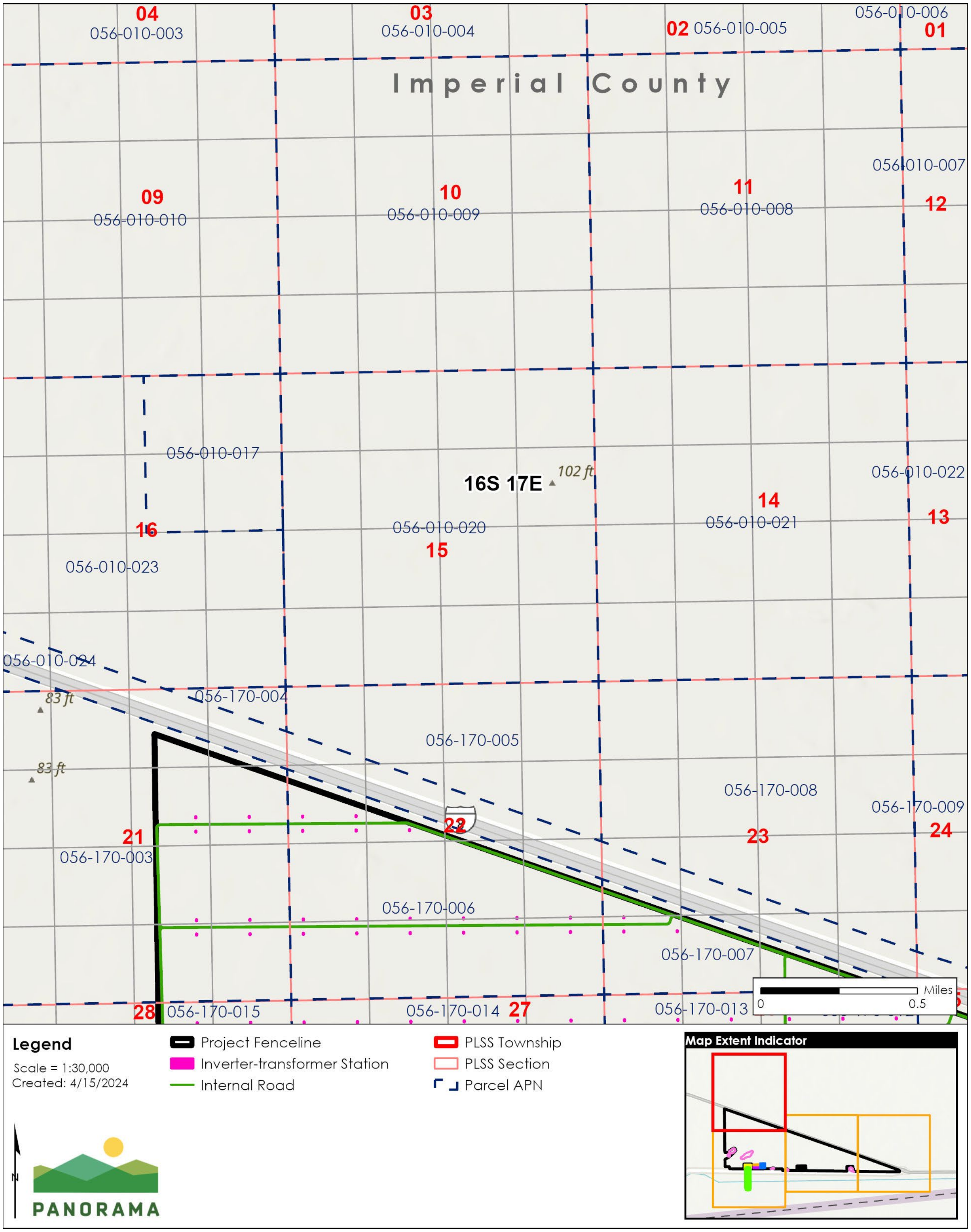
Figure 1 PLSS Mapbook Overview



Source: (Intersect Power 2023)

ATTACHMENT F

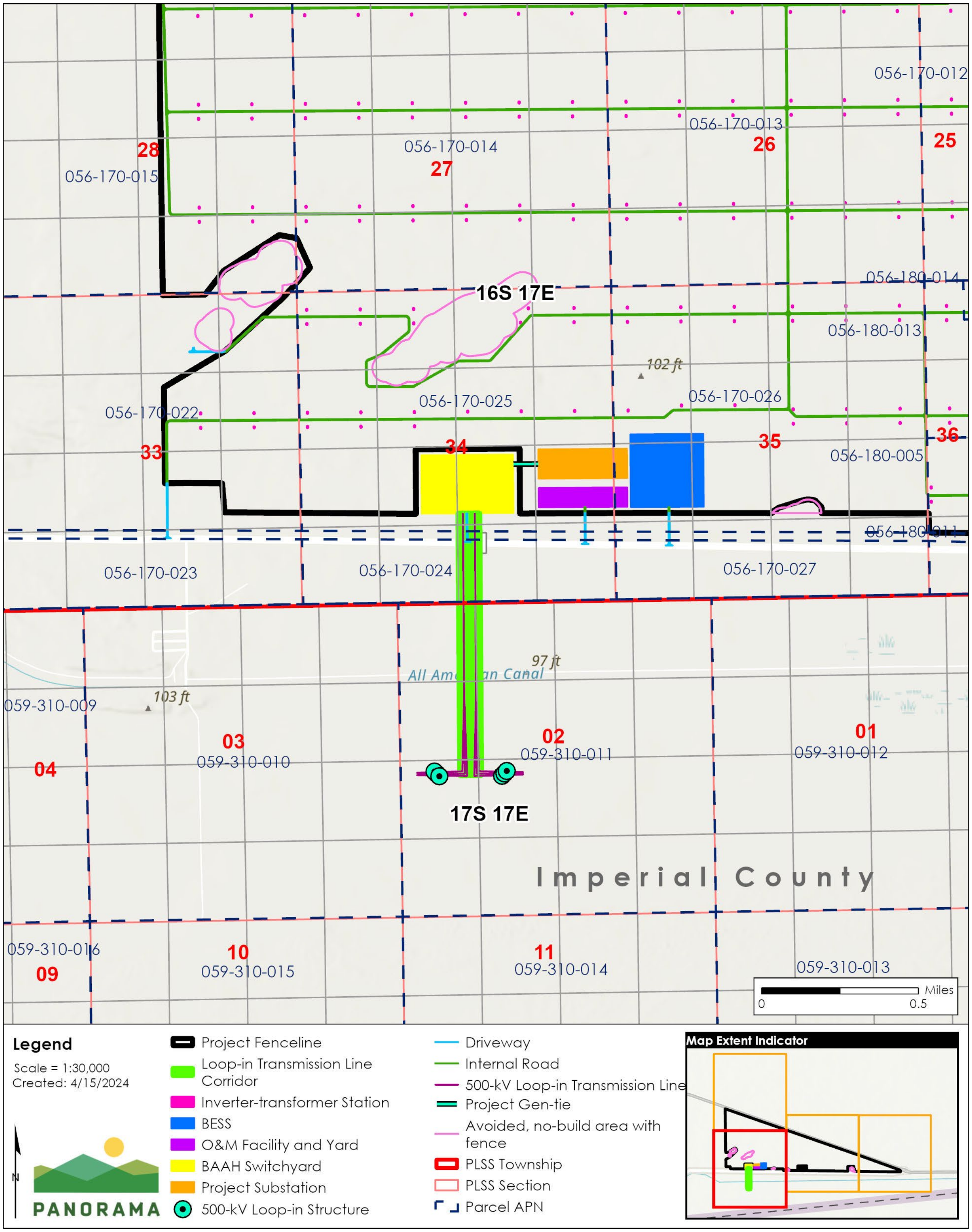
Figure 2 PLSS Mapbook Sheet 1



Source: (Intersect Power 2023) (BLM, n.d.) (BLM, n.d.-a) (BLM, n.d.-b)

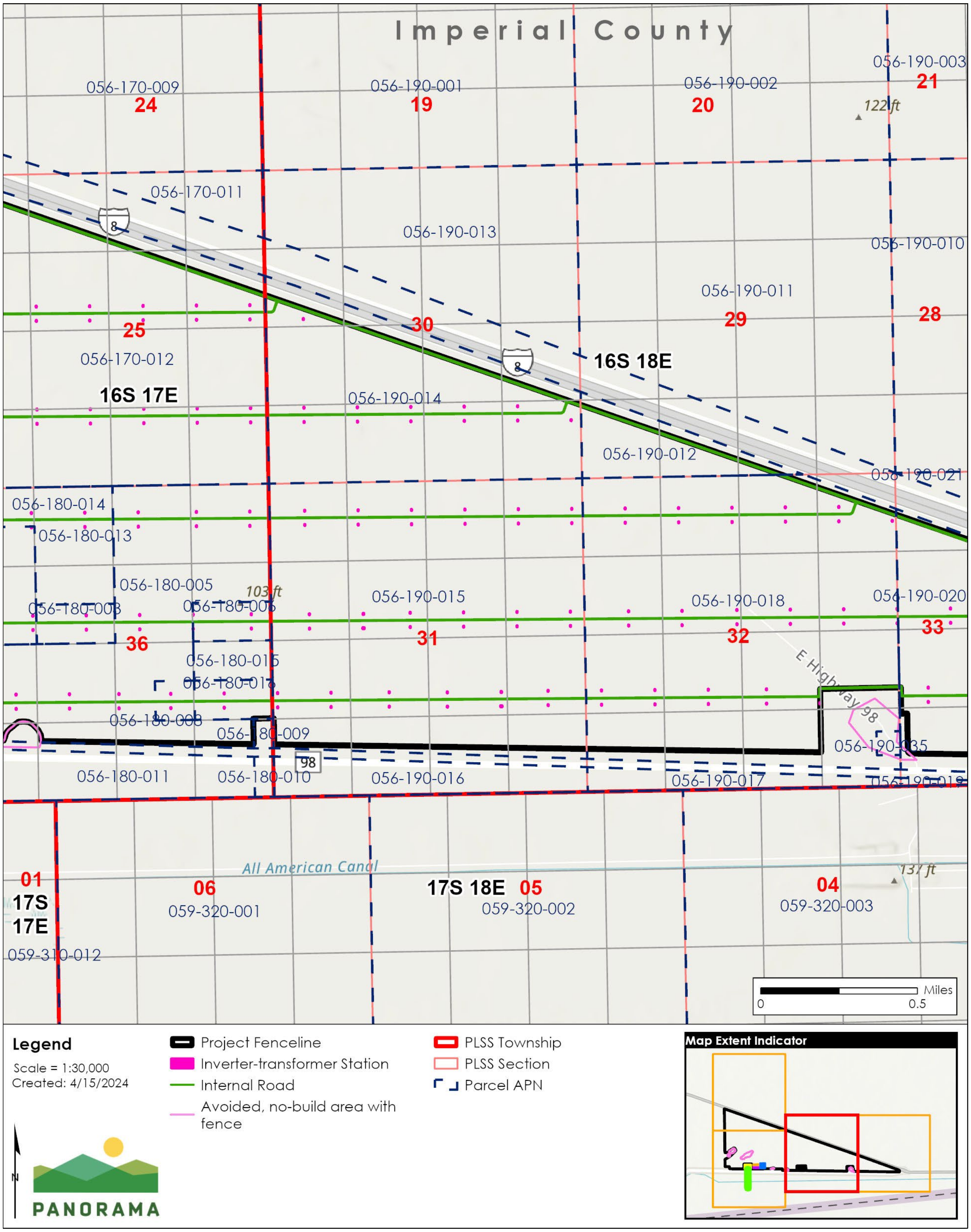
ATTACHMENT F

Figure 3 PLSS Mapbook Sheet 2



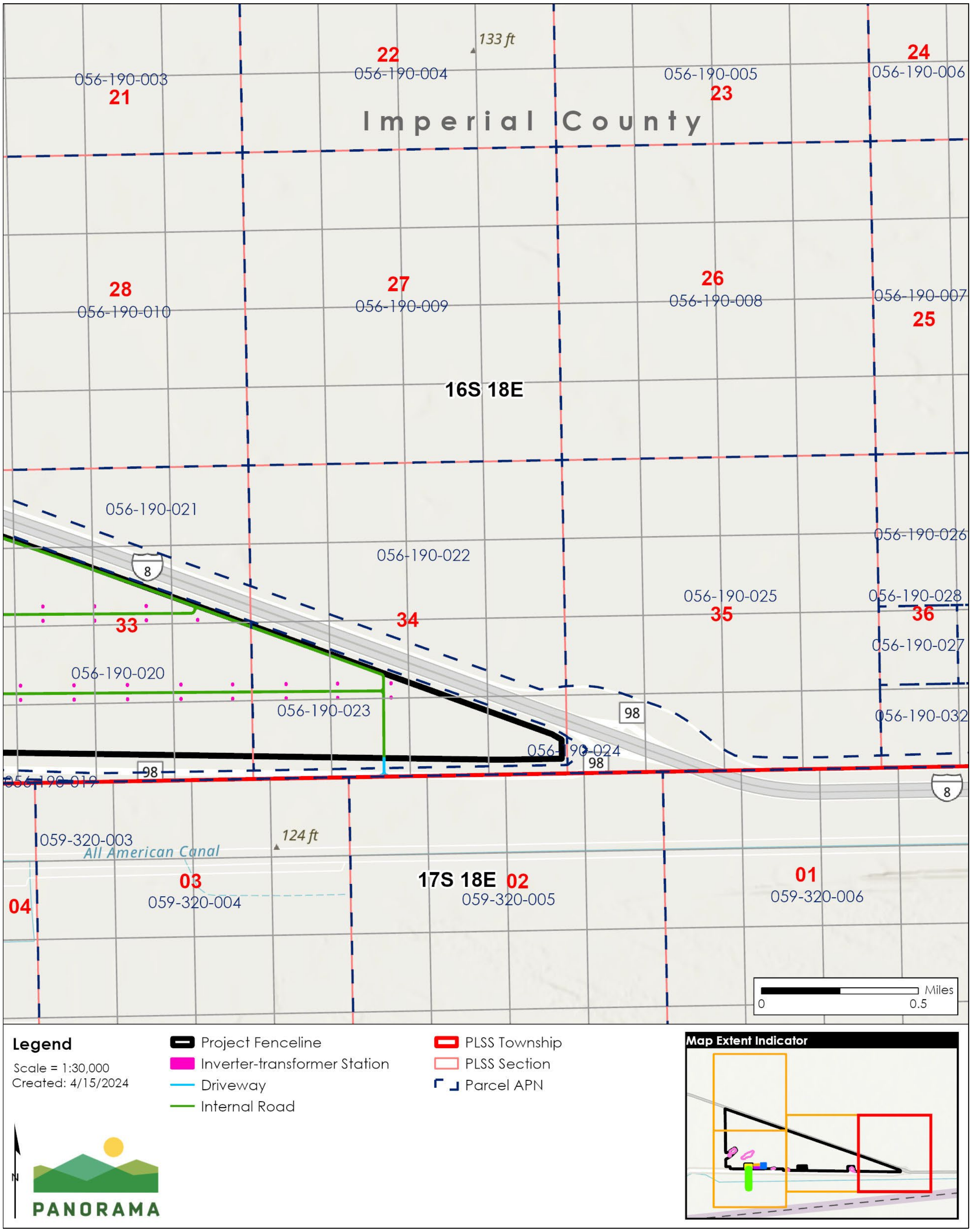
Source: (Intersect Power 2023) (BLM, n.d.) (BLM, n.d.-a) (BLM, n.d.-b)

Figure 4 PLSS Mapbook Sheet 3



Source: (Intersect Power 2023) (BLM, n.d.) (BLM, n.d.-a) (BLM, n.d.-b)

Figure 5 PLSS Mapbook Sheet 4

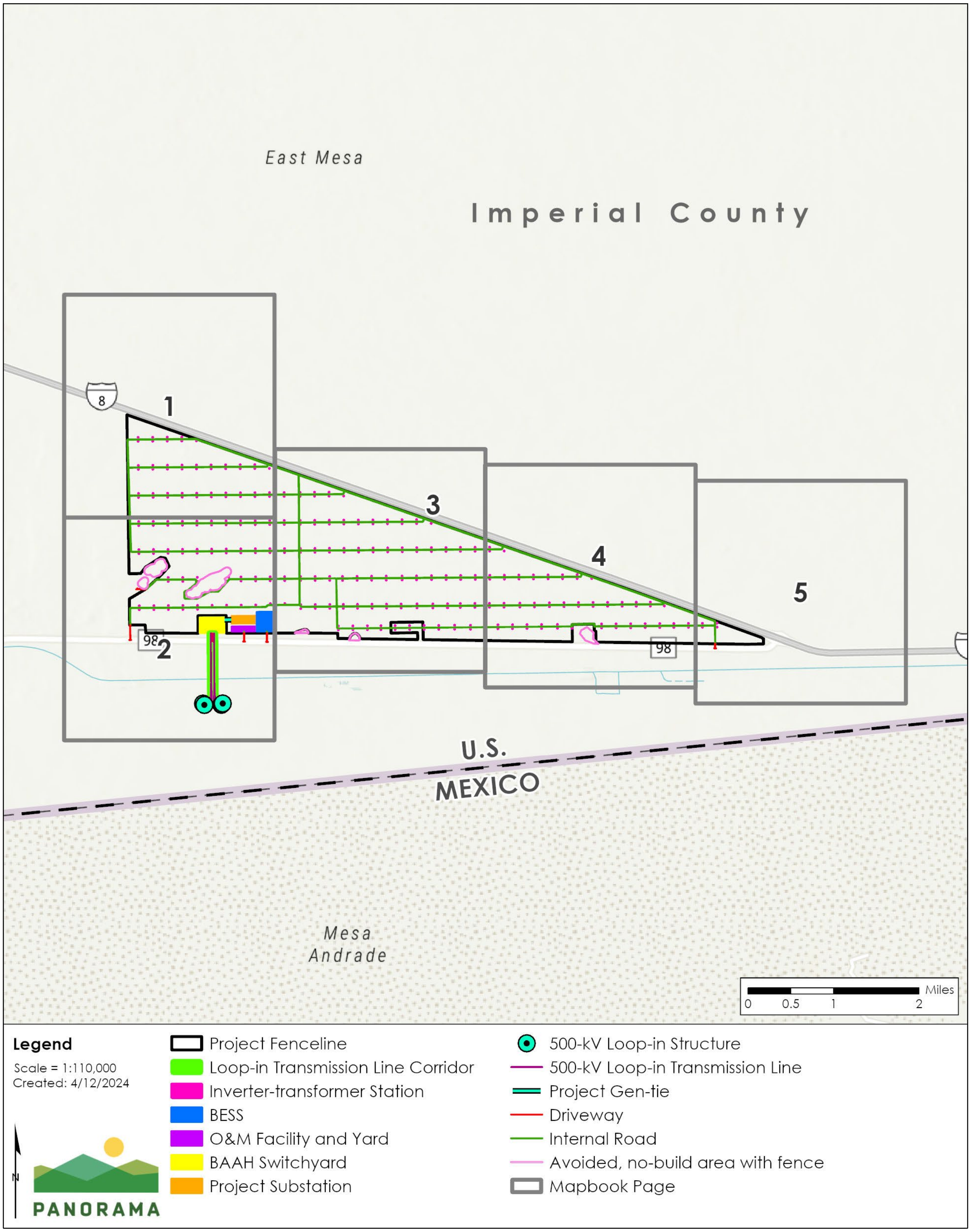


Source: (Intersect Power 2023) (BLM, n.d.) (BLM, n.d.-a) (BLM, n.d.-b)

Attachment F.2 Updated Existing Authorizations and Leaseholders on BLM Land Figures

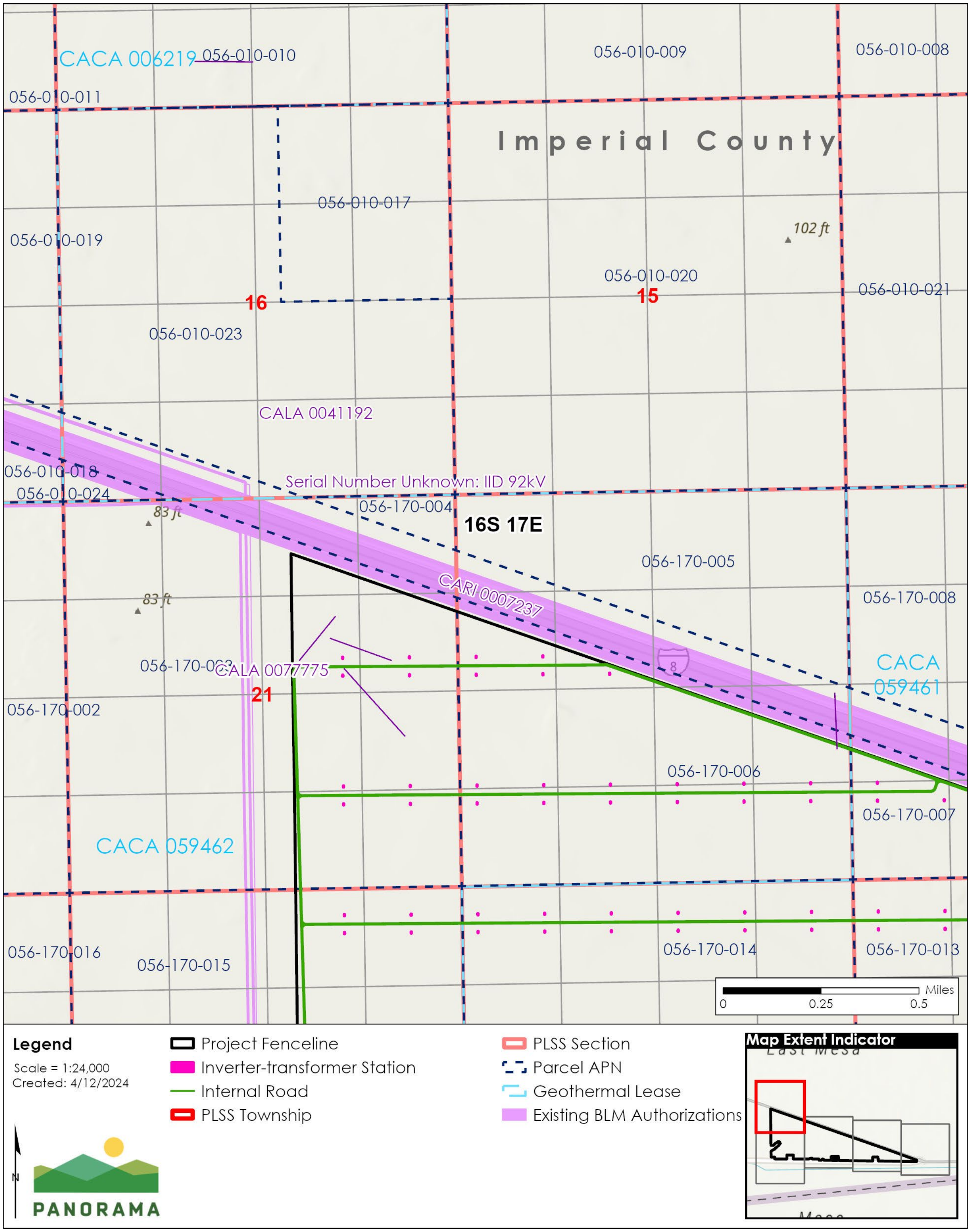
ATTACHMENT F

Figure 6 Authorizations and Leaseholders on BLM Lands Mapbook Overview



Source: (Intersect Power 2023)

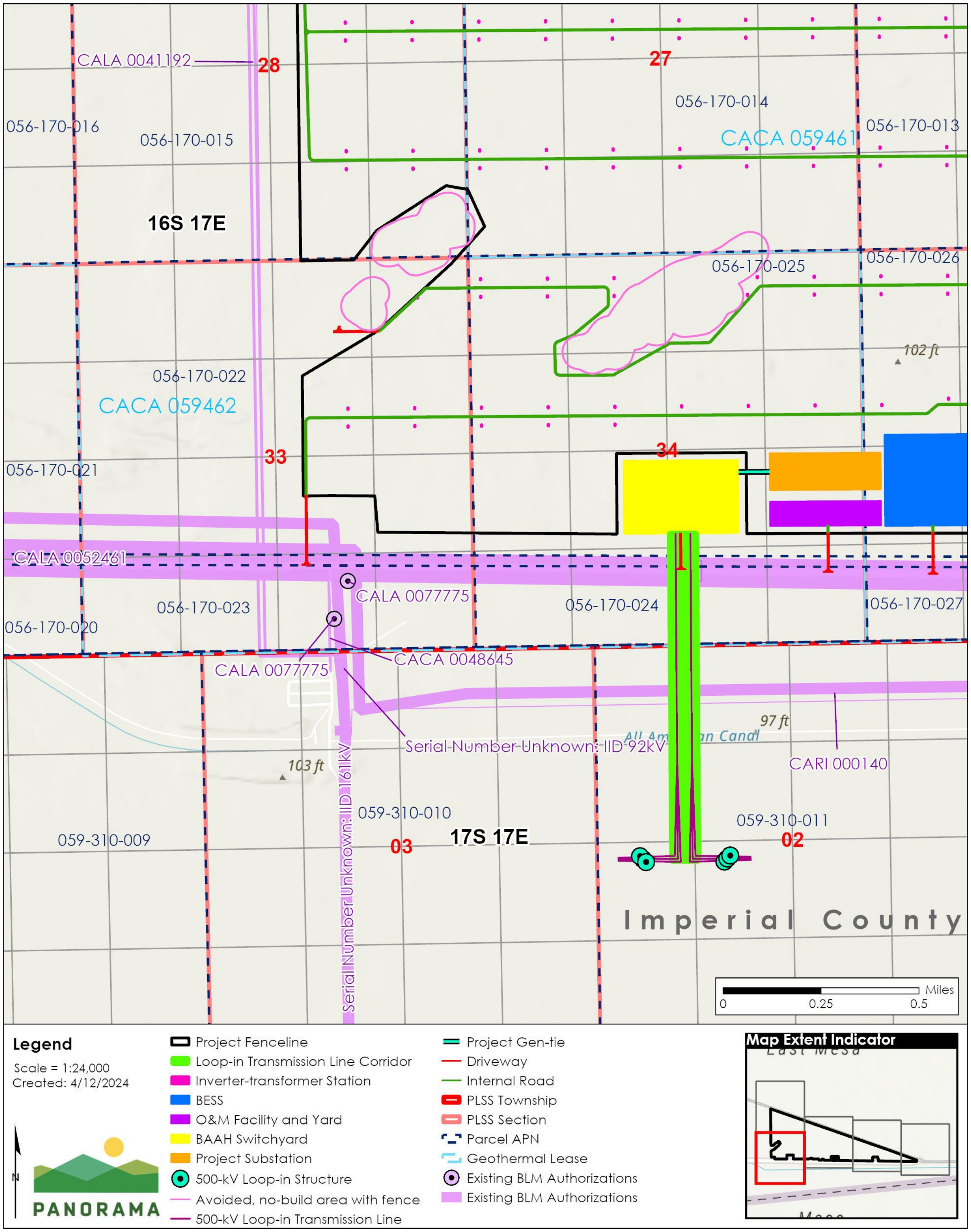
Figure 7 Authorizations and Leaseholders on BLM Lands Mapbook Sheet 1



Source: (Intersect Power 2023) (BLM, n.d.) (BLM, n.d.-a) (BLM, n.d.-b) (BLM, California State Office 2023) (Intersect Power 2024)

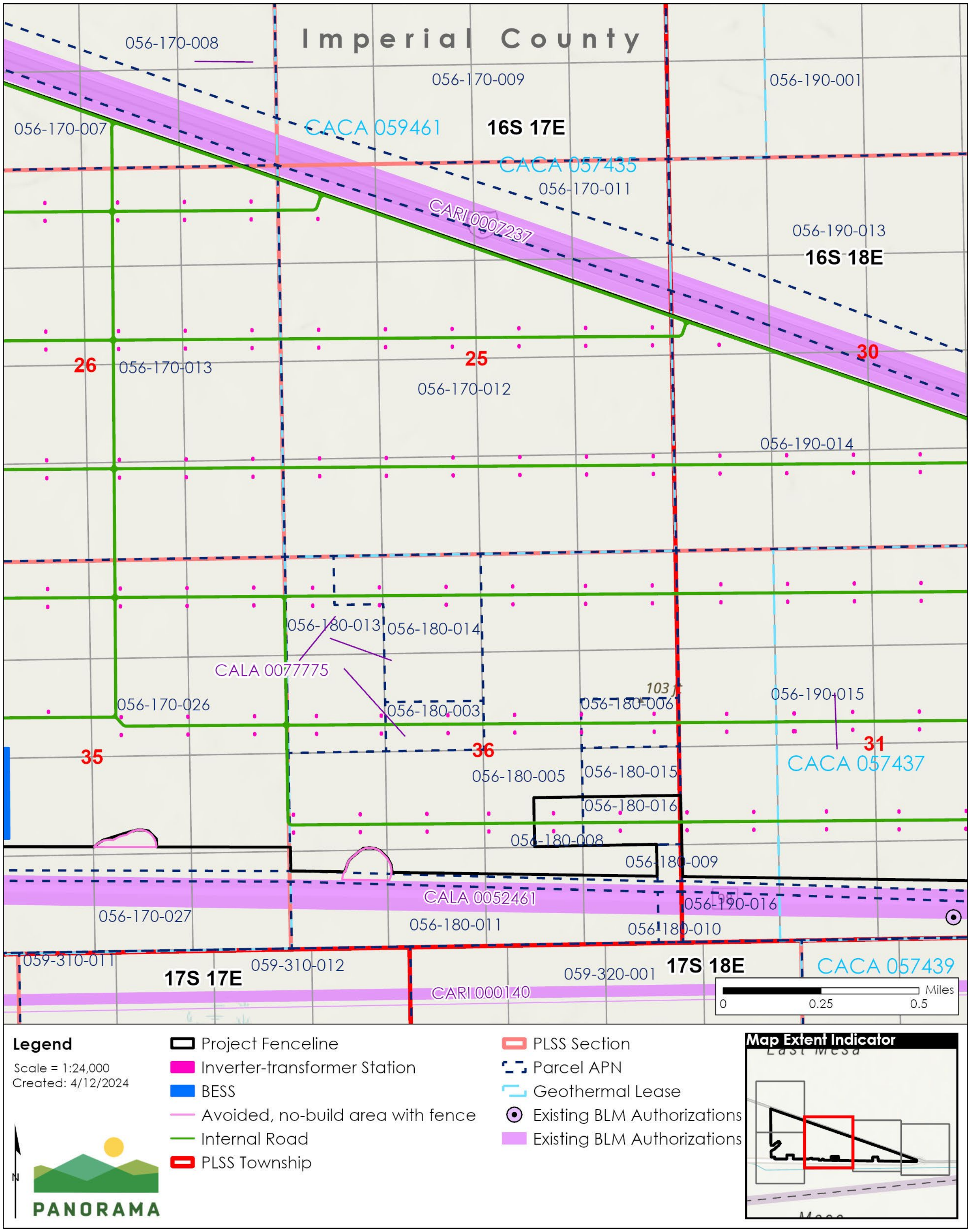
ATTACHMENT F

Figure 8 Authorizations and Leaseholders on BLM Lands Mapbook Sheet 2



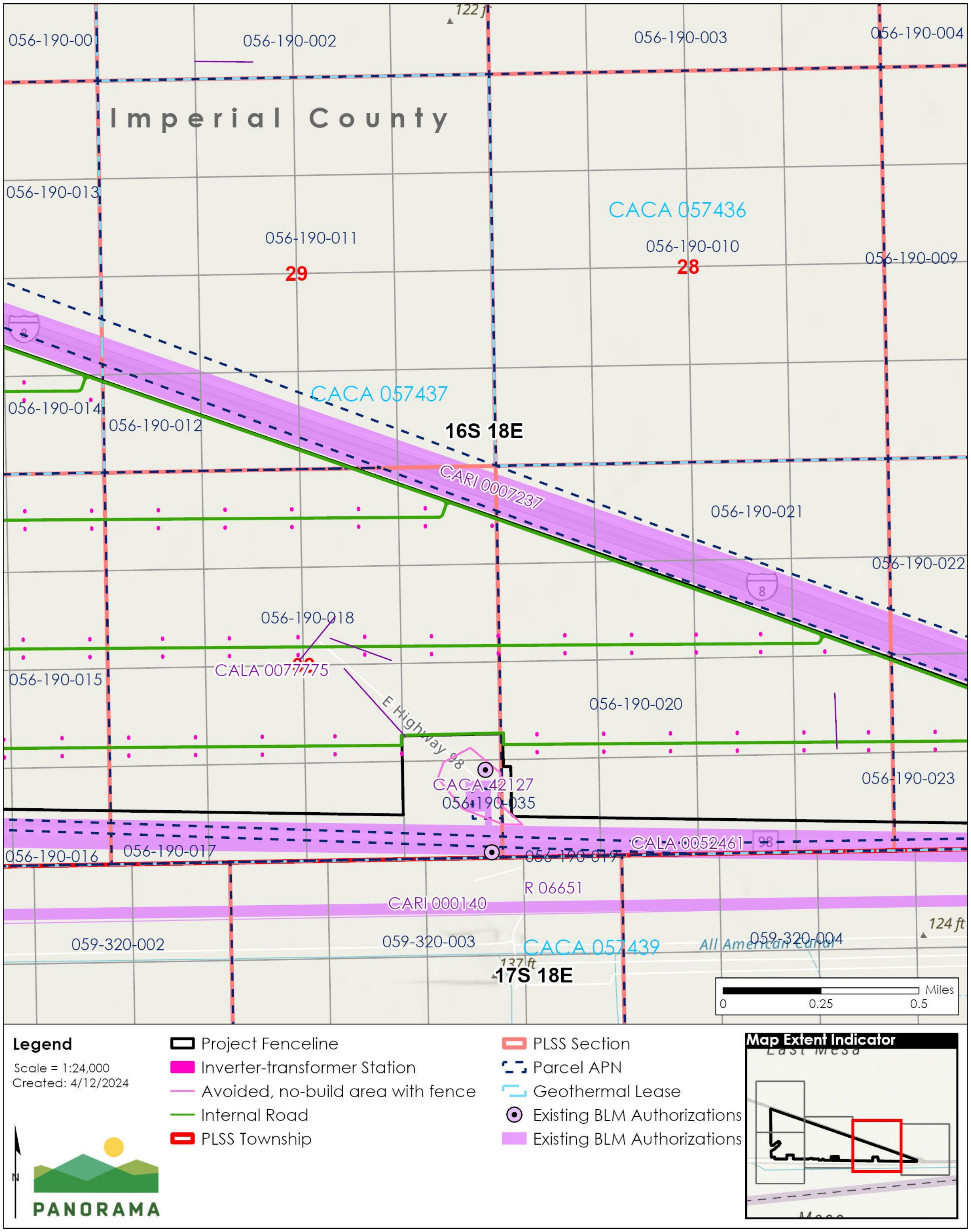
Source: (Intersect Power 2023) (BLM, n.d.) (BLM, n.d.-a) (BLM, n.d.-b) (BLM, California State Office 2023) (Intersect Power 2024)

Figure 9 Authorizations and Leaseholders on BLM Lands Mapbook Sheet 3



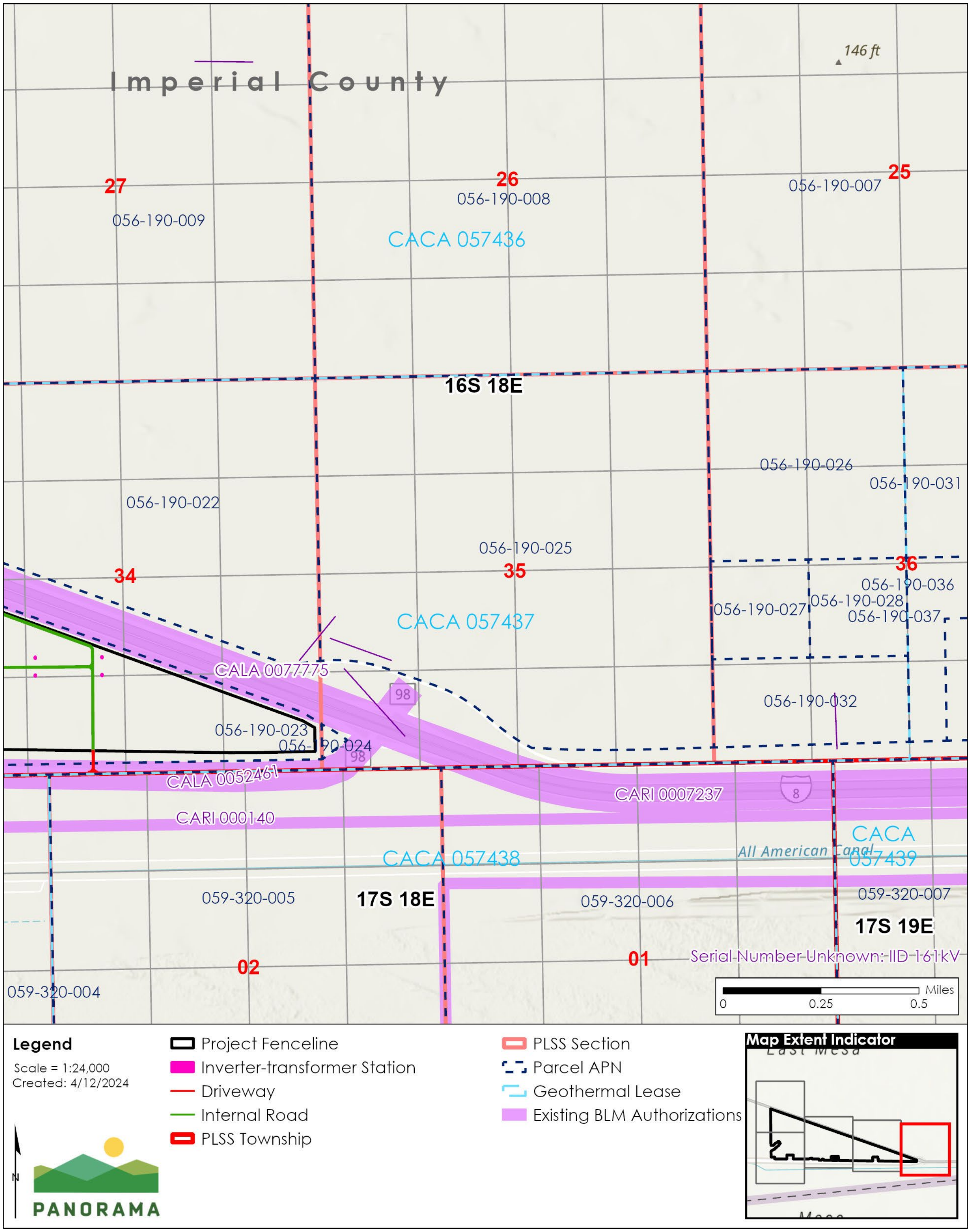
Source: (Intersect Power 2023) (BLM, n.d.) (BLM, n.d.-a) (BLM, n.d.-b) (BLM, California State Office 2023) (Intersect Power 2024)

Figure 10 Authorizations and Leaseholders on BLM Lands Mapbook Sheet 4



Source: (Intersect Power 2023) (BLM, n.d.) (BLM, n.d.-a) (BLM, n.d.-b) (BLM, California State Office 2023) (Intersect Power 2024)

Figure 11 Authorizations and Leaseholders on BLM Lands Mapbook Sheet 5



Source: (Intersect Power 2023) (BLM, n.d.) (BLM, n.d.-a) (BLM, n.d.-b) (BLM, California State Office 2023) (Intersect Power 2024)