DOCKETED	
Docket Number:	99-AFC-01C
Project Title:	Elk Hills Power Project - Compliance
TN #:	266445
Document Title:	Appendix J Energy Utilization Study
Description:	Appendix J Energy Utilization Study for CalCapture Project
Filer:	Daniel I. Padilla
Organization:	California Resources Corporation
Submitter Role:	Applicant
Submission Date:	10/10/2025 12:13:58 PM
Docketed Date:	10/10/2025

CalCapture CCS Project

Energy Utilization Study

Stantec

Prepared for:
Carbon TerraVault Holdings, LLC, a carbon management subsidiary of California Resources Corporation

Prepared by:
Stantec Consulting Services Inc.
2646 Santa Maria Way, Suite 107
Santa Maria, CA 9345

October 2025

Project/File:
185806775

Stantec Consulting Services Inc.

Revision Schedule

Revision	Description	Author	Date	Quality Check	Date	Independent Review	Date

Disclaimer

The conclusions in the Report titled CalCapture CCS Project Energy Utilization Study are Stantec's professional opinion, as of the time of the Report, and concerning the scope described in the Report. The opinions in the document are based on conditions and information existing at the time the scope of work was conducted and do not take into account any subsequent changes. The Report relates solely to the specific project for which Stantec was retained and the stated purpose for which the Report was prepared. The Report is not to be used or relied on for any variation or extension of the project, or for any other project or purpose, and any unauthorized use or reliance is at the recipient's own risk.

Stantec has assumed all information received from Carbon TerraVault Holdings, LLC, a carbon management subsidiary of California Resources Corporation (the "Client") and third parties in the preparation of the Report to be correct. While Stantec has exercised a customary level of judgment or due diligence in the use of such information, Stantec assumes no responsibility for the consequences of any error or omission contained therein.

This Report is intended solely for use by the Client in accordance with Stantec's contract with the Client. While the Report may be provided by the Client to applicable authorities having jurisdiction and to other third parties in connection with the project, Stantec disclaims any legal duty based upon warranty, reliance or any other theory to any third party, and will not be liable to such third party for any damages or losses of any kind that may result.

Prepared by: Briette Shea
Signature

Briette Shea

Reviewed by: Kaitlyn Heck
Signature

Kaitlyn Heck

Approved by: Eric K Snelling
Signature

Eric Snelling

Table of Contents

Acronyms / Abbreviations ..... **iii**
1 Introduction **1**
1.1 Project Description 1
1.2 CTV I Background Information 6
1.2.1 Steam Extraction Option 7
1.3 Project Location 7
2 Environmental Setting **9**
2.1 Electricity and Natural Gas 9
2.2 Petroleum Fuel 9
3 Regulatory Setting **10**
3.1 Federal 10
3.1.1 National Energy Conservation Policy Act 10
3.1.2 Energy Independence and Security Act of 2007 10
3.1.3 Corporate Average Fuel Economy Standards 11
3.1.4 Inflation Reduction Act of 2022 11
3.1.5 Declaring a National Energy Emergency 11
3.2 State 12
3.2.1 California Public Utilities Commission 12
3.2.2 California Energy Commission 12
3.2.3 California Energy Code 12
3.2.4 California Integrated Energy Policy 12
3.2.5 California Renewables Portfolio Standard 13
3.2.6 Low Carbon Fuel Standard 13
3.2.7 In-Use Off-Road Diesel-Fueled Fleets Regulation 13
3.2.8 2022 Scoping Plan for Achieving Carbon Neutrality 14
3.2.9 CARB Heavy-Duty Diesel Vehicle Idling Information 14
3.2.10 California Green Building Standards, Part 11, Title 24 15
3.2.11 Kern Council of Governments Regional Transportation Plan 15
3.3 Local 15
3.3.1 Kern County General Plan 15
4 Methodology **17**
4.1 Construction Assumptions 17
4.2 Operational Assumptions 18
4.2.1 Vehicle Trips 18
4.2.2 Carbon Capture and Sequestration Equipment 18
4.3 Decommissioning Assumptions 18
5 Energy Analysis **19**
5.1 CEQA Guidelines 19
5.2 Energy Impact Analysis 19
5.2.1 Impact Analysis 19
5.2.2 Impact Analysis 24
6 Cumulative Impacts **26**
7 Mitigation Measures **27**
8 References **28**

List of Tables

Table 1 Project Parcel Data 8
Table 2 Construction On-Road Vehicle Fuel Consumption 21
Table 3 Operational On-Road Vehicle Fuel Consumption 22

List of Figures

Figure 1 Regional Location 3
Figure 2 Project Location 4

List of Appendices

Appendix A Energy Calculations

Acronyms / Abbreviations

Acronym / Abbreviation	Full Name
2022 Scoping Plan	2022 Scoping Plan for Achieving Carbon Neutrality
AB	Assembly Bill
ACC	Advanced Clean Cars
CAFE	Corporate Average Fuel Economy
CALCOG	California Association of Councils of Governments
CalEEMod	California Emissions Estimator Model
CalGEM	California Geologic Energy Management Division
CALGreen	California Green Building Standards Code
CARB	California Air Resources Board
CCR	California Code of Regulations [
CCS	Carbon Capture and Sequestration
CCU	Carbon Capture Unit
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulation
CO_2	carbon dioxide
COG	Council of Governments
CPUC	California Public Utilities Commission
CRC	California Resources Corporation
CTV	Carbon TerraVault Holdings, LLC
CTV I	Carbon TerraVault I Project
CUP	Conditional Use Permit
the CUP	Collectively, CUP No. 13, Map 118; CUP No. 14, Map 118; CUP No. 5, Map 119; CUP No. 3, Map 120; CUP No. 2, Map 138; and CUP No. 6, Map 119
EFG+	Econamine FG Plus^{SM}
EHOF	Elk Hills Oilfield
EHPP	Elk Hills Power Plant
EIR	Environmental Impact Report
EISA	Energy Independence and Security Act

Acronym / Abbreviation	Full Name
EO	Executive Order
EPCA	Energy Policy and Conservation Act
EV	electric vehicle
GHG	greenhouse gases
GT	gas turbine
GWh	gigawatt-hours
HDD	horizontal directional drilling
HRSG	heat recovery steam generator
IP	intermediate power
IRA	Inflation Reduction Act
Kern COG	Kern Council of Governments
kV	kilovolt
kWh	kilowatt-hour
LCFS	Low Carbon Fuel Standard
LP	low pressure
M	magnitude
MDB&M	Mount Diablo Base and Meridian
MM	mitigation measure
MMPTY	Million Metric Tons Per Year
MPO	Metropolitan Planning Organization
MTPD	Metric Tons Per Day
MW	megawatt
MWe	megawatt equivalent
NHTSA	National Highway Traffic Safety Administration
NO_X	oxides of nitrogen
NOD	Notice of Determination
PG&E	Pacific Gas and Electric Company
PM	particulate matter
PRC	Public Resources Code
Project	CalCapture Carbon Capture and Sequestration Project
psig	pounds per square inch
RFS	renewable fuel standards

Acronym / Abbreviation	Full Name
RO	reverse osmosis
RPS	Renewable Portfolio Standard
RTP	Regional Transportation Plan
SB	Senate Bill
ST	steam turbine
Stantec	Stantec Consulting Services Inc.
UIC	Underground Injection Control
USC	U.S. Code
U.S. EPA	United States Environmental Protection Agency

1 Introduction

Stantec Consulting Services Inc. (Stantec) has prepared this Energy Utilization Study on behalf of Carbon TerraVault Holdings, LLC (CTV), a carbon management subsidiary of California Resources Corporation (CRC), for the CalCapture Carbon Capture Sequestration (CCS) Project (Project), located in the Elk Hills Oilfield (EHOF) near Tupman, Kern County, California (Project site). The Regional Location and Project Location are shown in Figures 1 and 2.

The purpose of this Energy Utilization Study is to determine the potential energy use, primarily in the form of petroleum fuel, associated with construction, operation, and decommissioning of the Project. This evaluation is consistent with the air quality and greenhouse gas (GHG) emissions modelling prepared for the Project (Stantec 2025).

1.1 Project Description

The proposed Project would capture carbon dioxide (CO_2) generated as a by-product by CRC's 550-megawatt-equivalent (MWe) Elk Hills Power Plant (EHPP), located in the EHOF near Tupman, Kern County, California. The EHPP was commissioned in 2003 and is powered by two General Electric 7FA gas turbines (GTs), with two heat recovery steam generators (HRSGs) providing steam to a General Electric D11 steam turbine (ST). The Carbon Capture Unit (CCU), not including pipelines or temporary staging and parking areas, would be located immediately south of the EHPP in a 7.64-acre existing disturbed area.

Implementation of the Project will require approval of a Petition for Modification Application from the California Energy Commission (CEC), who has the exclusive authority for licensing thermal power plants of 50 MW or larger, as well as related transmission lines, fuel supply lines, and other facilities.

The CCU would utilize Fluor's Econamine FG Plus^{SM} (EFG+) process to capture and concentrate the CO_2. The EFG+ process is designed to capture 95 percent of the CO_2 from the total flue gas feed to the unit. The EFG+ CCU can be divided into seven primary subsystems or sections: Flue Gas Cooling, CO_2 Absorption, Solvent Regeneration, Solvent Maintenance, Chemical Storage and Supply, CO_2 Compression, and Utility Support Systems. The treated flue gas is vented to the atmosphere directly from the EFG+ CCU plant absorber. The concentrated CO_2 would then be compressed, dehydrated, and stripped of oxygen prior to conveyance to the permitted manifold pad, permitted as part of the approved Carbon TerraVault I (CTV I) project (State Clearinghouse No. 2022030180), which will direct the CO_2 to the U.S. Environmental Protection Agency (U.S. EPA) approved Class VI Underground Injection Control (UIC) wells to be injected into a depleted oil and gas reservoir located on the CRC property and approved as part of the CTV I project. The previously approved CTV I manifold pad, injection wells, depleted oil and gas reservoir and related facilities further discussed in Section 1.2 below are not part of the CalCapture CCS Project analyzed in this report.

A new, approximately 0.5-mile, 8- to 10-inch pipeline, installed primarily below ground utilizing either trenching or horizontal directional drilling (HDD) techniques, would transport the CO_2 from the CCU to the

tie-in with the Carbon TerraVault I (CTV I) permitted 35R manifold facility (pad). It is anticipated that the proposed Project would capture approximately 4,400 metric tons of CO_2 per day (MTPD) (1.6 million metric tons of CO_2 per year [MMTPY]). The proposed Project is estimated to be in operation for up to 26 years.[1]

Water use during operation of the CalCapture CCU would be minimized by the inclusion of a hybrid cooling system (Wet Surface Air Coolers [WSAC], air coolers, secondary glycol cooling, and water cooling). Additionally, the CCU would be equipped with a water treatment system, consisting of a reverse osmosis (RO) Unit that is designed to recover and reuse water from the Cooling Tower blowdown. The recovered water is utilized as make-up to the CO_2 absorption system and the Wash Water WSAC Basin. A wastewater stream (less than 10 gallons per minute) would be collected at the CalCapture CCU and transferred by a new surface pipeline to the EHPP for disposal via an existing UIC Class I injection well.

The proposed Project includes a single connection to the CRC Power System and would include a connection of a new 115-kilovolt (kV) transmission line to a new CRC electrical substation. The proposed Project would require a new transmission tie line to connect the Project switching station to the existing CRC substation. Electrical power would be supplied to the CalCapture Substation with a new dedicated electrical transformer. The new 115-kV transmission tie line is expected to be built using pre-engineered steel poles with anchor bolt foundation designs.

During construction, temporary offices and existing parking areas would be used by construction personnel. Temporary office and parking areas have been designated on previously disturbed areas to the south and northeast of the Project site. Two additional areas are located approximately 5.5 miles southeast of the Project site. There are no permanent new buildings proposed for the Project, and no grading would occur within the temporary office and parking areas. Total temporary staging and parking area would be approximately 30.74 acres.

[1]The life of the project is dependent on the sources permitted for injection into the CTV I approved storage reservoir, the ability of the project year by year to obtain CO_2 and inject at the maximum 2,210,000 million tons per year, and the total estimated storage capacity of up to 48 million tons of CO_2.

Project Area
Township and Range
Section

0 2 4 Miles
(At original document size of 8.5x11)
1:253,440

N

Stantec

Project Location	Prepared by MMD on 2025-06-26
	TR by CT 2025-06-26
Kern County, CA	IR by ES on 2025-06-26
Client/Project	185806775

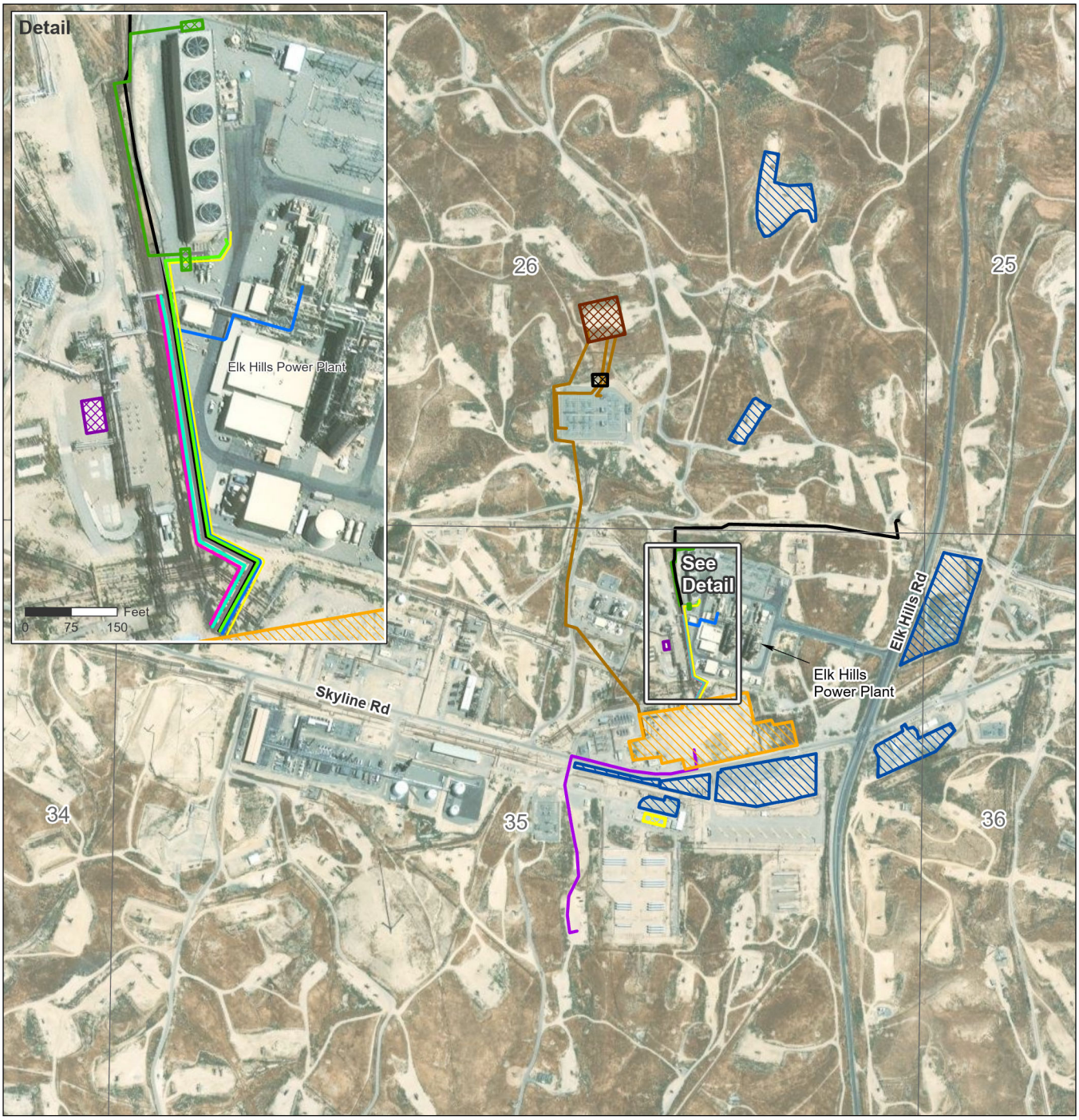
California Resources Corporation
CalCapture Carbon Capture and Sequestration Project

Figure No.
1

Title
Regional Vicinity

Notes
1. Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet
2. Data Sources: Stantec, USGS, 2025.
3. Background: Esri. GEBCO, NOAA, National Geographic, Garin, HERE, Geonames.org Copyright:©2013 National Geographic Society, i-cubed

V:\185806\Active\185806775_CRC_CalCapture\03_data\gis_cad\gis\proj\PD\PD_Figures_20250625.aprx Revised: 2025-06-26 By: mdeseo



Notes
1. Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet
2. Data Sources: Stantec, USGS, 2025.
3. Background: Esri. GEBCO, NOAA, National Geographic, Garin, HERE, Geonames.org Copyright:©2013 National Geographic Society, i-cubed

- Capture Facility
- Temporary Parking, Office, and Staging Areas
- Proposed Sub Location (250 x 250)
- Substation Extension Proposal
- New BPSTG & Transformer
- Warehouse
- Cooling Water Sump

Township, Range, Section*

- Section

*Entire map extent within Township 30S Range 23E.

- Electrical Lines
- CO2 Line
- CWR Line
- CWS Line
- Condensate Line
- HP Steam Line
- LP Steam Line
- Raw Water Line
- RO Permeate Stream Pipeline
- CWS Line Alternative

0 500 1,000 Feet
(At original document size of 8.5x11)
1:12,000

N

Stantec

Project Location	Prepared by MMD on 2025-07-31
	TR by CT 2025-07-31
Kern County, CA	IR by ES on 2025-07-31
Client/Project	185806775

California Resources Corporation
CalCapture Carbon Capture and Sequestration Project

Figure No.
2a

Title
Site Plan

V:\185806775_CRC_CalCapture\03_data\gis_cad\gis\proj\PD\PD_Figures_20250731.aprx Revised: 2025-07-31 By: mdeseo

Temporary Parking, Office, and Staging Areas

Township, Range, Section*

Section

*Entire map extent within Township 31S Range 24E.

0 800 1,600 Feet

(At original document size of 8.5x11)
1:19,200

N

Stantec

Project Location	Prepared by MMD on 2025-07-31
	TR by CT 2025-07-31
Kern County, CA	IR by ES on 2025-07-31
Client/Project	185806775

California Resources Corporation
CalCapture Carbon Capture and Sequestration Project

Figure No.
2b

Title
Site Plan

Notes
1. Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet
2. Data Sources: Stantec, USGS, 2025.
3. Background: Esri. GEBCO, NOAA, National Geographic, Garin, HERE, Geonames.org Copyright:©2013 National Geographic Society, i-cubed

V:\1858\Active\185806775_CRC_CalCapture\03_data\gis_cad\gis\proj\PD\PD_Figures_20250731.aprx Revised: 2025-07-31 By: mdeseo

1.2 CTV I Background Information

On December 31, 2024, the U.S. EPA issued four UIC Class VI well permits to CTV, a carbon management subsidiary of CRC.

The specific U.S. EPA permits issued for the four wells are as follows:

- R9UIC-CA6-FY22 1.1 for well 373-35R
- R9UIC-CA6-FY22 1.2 for well 345C-36R
- R9UIC-CA6-FY22 1.3 for well 353XC-35R
- R9UIC-CA6-FY22 1.4 for well 363C-27R

These four wells would be utilized to inject the CO_2 captured from the proposed Project into the Monterey Formation 26R storage reservoir located approximately 6,000 feet below the ground surface. The CTV I project area is located within the EHOF, which is a suitable area for long-term CO_2 storage and sequestration. The CTV I project was designed to implement sustainable CCS in support of California's initiative to combat climate change by reducing CO_2 levels in the atmosphere.

In addition to the Class VI Permit, CTV obtained a land use permit from the Kern County Planning and Natural Resources Department (Kern County) in 2024. Specifically, the CTV I project was approved by the Kern County Board of Supervisors on October 21, 2024, based on a final Environmental Impact Report (EIR, State Clearinghouse #2022030180) prepared by Kern County and certified by it on the same date. A Notice of Determination was filed with the Kern County Clerk on October 22, 2024. The CTV I project is subject to the terms, conditions and restrictions set forth in the Conditional Use Permits (CUP) issued by Kern County and identified as CUP No. 13, Map 118; CUP No. 14, Map 118; CUP No. 5, Map 119; CUP No. 3, Map 120; CUP No. 2, Map 138; and CUP No. 6, Map 119 (collectively, "the CUP"). Implementation of the CUP authorizes the construction and operation of underground CO_2 facility pipelines to support the CTV I CCS facility and related infrastructure (e.g., injection/monitoring wells, CO_2 manifold piping and metering facilities) within the 9,104-acre project site, located within the EHOF.

Four monitoring wells permitted by the California Geologic Energy Management Division (CalGEM), as part of the CUP issued by Kern County for the CTV I project would be used for CO_2 monitoring. In addition, six CTV I permitted wells would be used to monitor for seismic activity. The seismic monitoring wells will be used to detect seismic events at or above magnitude (M) 1.0 in real time as required by the California Air Resources Board (CARB) CCS Protocol under the Low Carbon Fuel Standard (LCFS) (C.4.3.2.3). Additionally, the California Integrated Seismic Network will be monitored continuously for indication of a 2.7 M or greater earthquake or greater occurring within a 1-mile radius of injection operations from commencement of injection activity to its completion.

Monitoring activities would extend beyond the injection phase of the Project pursuant to Code of Federal Regulation (CFR) Title 40 Section 146.93 until site closure is granted. Monitoring requirements during post-injection are similar to those during injection, with activities such as sampling occurring quarterly and monitoring well integrity testing at frequency per U.S. EPA requirement.

As noted above, the facilities approved as part of the CTV I project, including but not limited to the manifold, pad, injection wells, monitoring wells and related transmission lines, pipelines and other related facilities that have already been approved by applicable agencies with jurisdiction over those facilities, including the U.S. EPA, CalGEM and Kern County, are not included as part of the proposed Project. Accordingly, such facilities are not analyzed in this report.

1.2.1 Steam Extraction Option

To supply the required thermal energy to the CCU, the proposed Project includes steam supply from the existing ST low pressure (LP) inlet/ intermediate pressure (IP)-LP crossover via addition of a new controlled extraction. Supply of steam from the LP inlet/IP-LP crossover will require modification to the existing ST to accommodate the new controlled extraction. This equipment will support operation of the CCU via new steam extraction, but it will also maintain the capability for the ST to operate with the extraction closed when the CCU is not in operation. In case the steam extraction cannot meet the full required thermal energy to the CCU, a supplemental natural gas fired boiler at the CCU, with up to 160 MMBtu/hr fuel input, has been considered in the project impacts. Flue gas from the boiler would be ducted to the CCU for CO_2 capture.

As an option to steam extraction from the existing EHPP ST, CRC is also including a non-condensing back pressure ST in the proposed Project.

The steam supply tie-in will be located at the common steam header from EHPP, after combining flow from both HRSGs. The back pressure ST will be designed to exhaust at 55 pounds per square inch (psig) and the steam exhausting from the back pressure turbines will be superheated, with the amount of superheat varying depending on the steam supply location and the operating load. Further desuperheating to meet specific CCU requirements will be accomplished within the CCU.

The back pressure ST would electrically interconnect with the existing electrical infrastructure at EHOF. A new step-up transfer would be used to step up from the back pressure turbine generator voltage to the existing substation. The new back pressure ST could be located within a developed area between EHPP and the adjacent cogeneration facility.

The steam supply piping would follow similar pathway/corridor as the current main steam extraction/supply from EHPP to the adjacent cogeneration facility. Steam exhausting from the new back pressure ST would be routed to the tie-in location at the CCU.

1.3 Project Location

The Project is located within the EHOF in the southwestern edge of the San Joaquin Valley near Tupman in Kern County, California.

The Project comprises portions of six parcels owned by CRC. The Project is contained within the following sections of EHOF: sections 26, 34, and 35 of Township 30 South Range 23 East and sections 10 and 11 of Township 31 South Range 24 East, Mount Diablo Base and Meridian (MDB&M), Kern

County, State of California (Table 1). The proposed Project would be located on approximately 52 acres within the identified parcels.

Table 1 Project Parcel Data

Assessor's Parcel Number	Section/ Township/ Range	Acreage*
158-090-19	Section 35/ Township 30S/ Range 23E	590.61
158-090-16	Section 35/ Township 30S/ Range 23E	14.78
158-090-02	Section 26/ Township 30S/ Range 23E	640
158-090-04	Section 34/ Township 30S/ Range 23E	682.86
298-070-05	Section 11/Township 31S/Range 24E	640
298-070-06	Section 10/Township 31S/Range 24E	640

Notes:
Assessor's parcel acreages from Kern County Web Map (Kern County GIS, 2025).

2 Environmental Setting

2.1 Electricity and Natural Gas

Pacific Gas and Electric Company (PG&E) provides natural gas and electric service to approximately 16 million people throughout a 70,000-square-mile service area in northern and central California, including Kern County (PG&E 2025b). In February 2018, PG&E announced that it had reached California's 2020 renewable energy goal 3 years ahead of schedule (PG&E 2018). In 2022, approximately 38 percent of PG&E's electricity came from eligible renewable resources including solar, wind, geothermal, biomass and small hydroelectric sources. Additionally, approximately 95 percent of PG&E's total electric power mix was from GHG-free sources, which include nuclear and large hydroelectric sources of energy (CEC 2025).

The CEC tracks electricity and natural gas consumption across the state for residential and non-residential sources. In 2022, Kern County used a total of 14,861 gigawatt-hours (GWh) of electricity and 1,774 million therms of natural gas. Approximately 81 percent of the electricity usage and 94 percent of the natural gas usage in the County was attributed to non-residential consumption (CEC 2016a, 2016b).

2.2 Petroleum Fuel

According to the U.S. Energy Information Administration, California used approximately 628 million barrels of petroleum in 2022. By sector, 85 percent (533,951 thousand barrels) of the state's petroleum was used by transportation, 11 percent from industrial uses (70,102 thousand barrels), 3 percent from commercial uses (18,126 thousand gallons), and 1 percent from residential uses (5,850 thousand barrels) (U.S. Energy Information Administration 2025).

In 2024, California sold 2.7 billion gallons of diesel fuel and 12.3 billion gallons of gasoline (CDTFA 2025a, 2025b).

3 Regulatory Setting

The following includes the key federal, state, and local regulations related to energy resources that are applicable to the Project.

3.1 Federal

3.1.1 National Energy Conservation Policy Act

The National Energy Conservation Policy Act (42 U.S. Code [USC] Sections 8201 et seq.) serves as the underlying authority for federal energy management goals and requirements and is the foundation of most federal energy requirements. The National Energy Conservation Policy Act also established fuel economy standards for on-road motor vehicles in the United States. The National Highway Traffic Safety Administration (NHTSA) is responsible for establishing additional vehicle standards and for revising existing standards. NHTSA and the U.S. EPA are taking coordinated steps to enable the production of clean energy vehicles with improved fuel efficiency. NHTSA sets the Corporate Average Fuel Economy (CAFE) levels, which are rapidly increasing over the next several years to improve energy security and reduce fuel consumption.

3.1.2 Energy Independence and Security Act of 2007

The Energy Independence and Security Act (EISA) aimed to increase United Sates energy security, increased CAFE standards for motor vehicles, and included provisions related to energy efficiency, such as renewable fuel standards (RFS), appliance and lighting efficiency standards; and building energy efficiency standards. The EISA required increasing levels of renewable fuels to replace petroleum. The U.S. EPA is responsible for developing and implementing regulations to ensure transportation fuel sold into the United States contains a minimum volume of renewable fuel.

The RFS programs regulations were developed in collaboration with refiners, renewable fuel products, and other stakeholders and were created under the Energy Policy Act of 2005. The RFS program established the first renewable fuel volume mandate in the United States. As required under the EISA, the original RFS program required 7.5 billion gallons of renewable fuel to be blended into gasoline by 2012. The RFS program was expanded in several ways that laid the foundation for achieving significant reductions of GHG emissions through the use of renewable fuels, for reducing imported petroleum, and for encouraging the development and expansion of the nation’s renewable fuels sector. The updated program is referred to as RFS2, and includes the following:

- EISA expanded the RFS program to include diesel, in addition to gasoline;
- EISA increased the volume of renewable fuel required to be blended into transportation fuel from 9 billion gallons in 2008 to 36 billion gallons by 2022;
- EISA established new categories of renewable fuel and set separate volume requirements for each one; and

- EISA required by the U.S. EPA to apply lifecycle GHG performance threshold standards to ensure that each category of renewable fuel emits fewer GHGs than the petroleum fuel it replaces.

Additional provisions of the EISA address energy savings in government and public institutions, promoting research for alternate energy, additional research in carbon capture, international energy programs, and the creation of "green jobs."

3.1.3 Corporate Average Fuel Economy Standards

The Energy Policy and Conservation Act of 1975 (EPCA) mandated that NHTSA establish and implement a regulatory program for motor vehicle fuel economy, known as the CAFE program, to reduce national energy consumption. The CAFE program establishes average fuel economy standards for passenger cars and light-duty trucks (see 49 USC Sections 32901 et seq.). The EISA, discussed above, amended the CAFE program requirements by providing the Department of Transportation additional rulemaking authority and responsibilities. In June 2024, NHTSA finalized CAFE standards for model years 2027 to 2031. The standards will bring the average light-duty vehicle fuel economy to approximately 50.4 miles per gallon by model year 2031. In addition, heavy-duty pickup truck and van fuel efficiency will increase to an average of approximately 35 miles per gallon by model year 2035. NHTSA projects that the foregoing standards will avoid the consumption of almost 70 billion gallons of gasoline through 2050, preventing more than 710 million metric tons of CO_2 emissions by 2050 (NHTSA 2024).

3.1.4 Inflation Reduction Act of 2022

The Inflation Reduction Act (IRA) of 2022 is considered the most ambitious climate law in United States history, and is intended to reduce GHG emissions, help build a clean economy, reduce energy costs for Americans, and advance environmental justice. With funding from the IRA, the United States. U.S. EPA has launched a network of clean energy financing and provided grant funding for climate pollution reduction programs (U.S. EPA 2023). The IRA increases the 45Q tax credit, a credit to incentivize carbon capture projects, to $85 per ton for geologic sequestration of CO_2 from industrial sources. The IRA project funding has been paused under Executive Order (EO) as signed in January 2025 entitled Unleashing American Energy.

3.1.5 Declaring a National Energy Emergency

In January 2025, EO 14156 was issued declaring a national energy emergency. The EO is intended to address the identified emergency and reduce energy prices by expediting energy and infrastructure projects and facilitating the production of domestic energy resources, which include, but are not limited to, crude oil, natural gas, petroleum products, coal, biofuels, hydropower, and minerals.

3.2 State

3.2.1 California Public Utilities Commission

The California Public Utilities Commission (CPUC) is a state agency created by a constitutional amendment to regulate privately-owned utilities providing telecommunications, electric, natural gas, water, railroad, rail transit, and passenger transportation services and in-state moving companies. The CPUC is responsible for ensuring that California utility customers have safe, reliable utility services at reasonable rates, while protecting utility customers from fraud. The CPUC regulates the planning and approval for the physical construction of electric generation, transmission, or distribution facilities, and local distribution pipelines of natural gas.

3.2.2 California Energy Commission

The Warren-Alquist Energy Resources Conservation and Development Act (Warren-Alquist Act of 1974; Public Resources Code [PRC] Sections 25000 et seq.) created the CEC, California's primary energy and planning agency. The CEC is charged with forecasting future energy needs, promoting energy efficiency and conservation through setting standards, supporting energy-related research, developing renewable energy resources, advancing alternative and renewable transportation fuels and technologies, certifying certain thermal power plants, and planning for and directing state response to energy emergencies. Additionally, the Warren-Alquist Act of 1974 acknowledges the need for renewable energy resources and encourages the CEC to explore renewable energy options that would be in line with environmental and public safety goals.

3.2.3 California Energy Code

New buildings in California must comply with the California Energy Code (Title 24, Part 6; California's Energy Efficiency Standards). These efficiency standards apply to new construction of both residential and nonresidential buildings (e.g., maintenance buildings and pump station buildings associated with the Project), and address energy consumed for heating, cooling, ventilation, water heating, and lighting. The building efficiency standards are enforced through the local building permit processes, and local jurisdictions may adopt and enforce energy standards for new buildings provided that these standards meet or exceed those provided in Title 24.

3.2.4 California Integrated Energy Policy

Senate Bill (SB) 1389 requires the CEC to "conduct assessments and forecasts of all aspects of energy industry supply, production, transportation, delivery and distribution, demand, and prices. The CEC shall use these assessments and forecasts to develop energy policies that conserve resources, protect the environment, ensure energy reliability, enhance the state's economy, and protect public health and safety." (PRC Section 25301[a]). The CEC adopts an Integrated Energy Policy Report every 2 years and an update every other year. The most recent version is the 2023 Integrated Energy Policy Report (CEC 2023).

3.2.5 California Renewables Portfolio Standard

California's Renewables Portfolio Standard (RPS) was initially established in 2002 by SB 1078, with the initial requirement that 20 percent of electricity retail sales be served by renewable resources by 2017. Renewable sources of electricity include wind, small hydropower, solar, geothermal, biomass, and biogas. The program was accelerated in 2015 with SB 350, which mandated a 50 percent RPS by 2030. In 2018, SB 100 was signed into law, which again increases the RPS to 60 percent by 2030 and requires all the state's electricity to come from carbon-free resources by 2045 (CPUC 2025).

CPUC implements and administers RPS compliance rules for California's retail sellers of electricity, which include large and small investor-owned utilities, publicly owned utilities, electric service providers, and community choice aggregators. The CEC is responsible for the certification of electrical generation facilities as eligible renewable energy resources and adopting regulations for the enforcement of RPS procurement requirements of public owned utilities.

3.2.6 Low Carbon Fuel Standard

In 2007, Governor's EO S-01-07 established the Low Carbon Fuel Standard (LCFS) and directed the Secretary for Environmental Protection to coordinate the actions of the CEC, CARB, the University of California, and other agencies to develop and propose protocols for measuring the "life-cycle carbon intensity" of transportation fuels. CARB adopted the LCFS on April 23, 2009.

The LCFS was subject to legal challenge in 2011. Ultimately, CARB was required to bring a new LCFS regulation for consideration in February 2015. The proposed LCFS regulation was required to contain revisions to the 2010 LCFS and new provisions designed to foster investments in the production of the low-carbon fuels, offer additional flexibility to regulated parties, update critical technical information, simplify and streamline program operations, and enhance enforcement. The LCFS has been subsequently amended to strengthen the carbon intensive fuel reduction targets beyond 2020 and to expand fuel types and activities eligible to participate in LCFS, among other changes (CARB 2025a).

One of the specific regulations added in 2018 is the Carbon Capture and Sequestration Protocol under the Low Carbon Fuel Standard (CARB 2018). The Carbon Capture and Sequestration Protocol establishes methodology for quantifying geological CO_2 sequestration, and permanence requirements related to site characteristics, plume extent evaluation, testing and monitoring, well operation, post-injection site care, and more.

3.2.7 In-Use Off-Road Diesel-Fueled Fleets Regulation

In 2007, CARB approved the In-Use Off-Road Diesel-Fueled Fleets Regulation (Off-Road Regulation) (13 California Code of Regulations [CCR] Section 2449 et seq.). The goal of the Off-Road Regulation is to reduce particulate matter (PM) and oxides of nitrogen (NO_x) emissions from existing off-road heavy-duty diesel vehicles in California. This is achieved by imposing idling limits on vehicles; establishing reporting requirements through the CARB "DOORS" program; restricting the addition of older vehicles into fleets;

requiring the phase-out of old and inefficient equipment; requiring the procurement and use of renewable diesel; and others (CARB 2025b).

In November 2022, CARB approved amendments to the Off-Road Regulation that became effective October 1, 2023. The 2022 amendments were one of several measures identified for action by CARB as part of the 2022 State Strategy for the State Implementation Plan. These amendments would achieve additional NO_x and PM reductions and enhance the enforceability of the Off-Road Regulation.

3.2.8 2022 Scoping Plan for Achieving Carbon Neutrality

The 2022 Scoping Plan for Achieving Carbon Neutrality (2022 Scoping Plan) was approved by the CARB in December 2022 and assesses progress toward achieving the state's GHG reduction goals and establishes a path to achieve carbon neutrality no later than 2045. The 2022 Scoping Plan focuses on outcomes needed to achieve carbon neutrality by assessing paths for advancing transportation technology, clean energy deployment, maintenance and preservation of natural and working lands, and others, and is designed to meet the state's long-term climate objectives. Specifically, the 2022 Scoping Plan identifies carbon negative technologies, including nature-based and mechanical carbon sequestration projects, as an essential component in achieving state-wide carbon neutrality (CARB 2022).

3.2.8.1 Assembly Bill 1493: Pavley Regulations and Fuel Efficiency Standards

Assembly Bill (AB) 1493, enacted on July 22, 2002, required CARB to develop and adopt regulations and fuel efficiency standards that reduce GHGs emitted by passenger vehicles and light-duty trucks. The fuel efficiency standards were phased in during the 2009 through 2016 model years.

The second phase of the implementation for AB 1493 was incorporated into Amendments to the LEV III or the Advanced Clean Cars II (ACC) program. The ACC II program combines the control of smog-causing pollutants and GHG emissions into a single coordinated package of requirements for model years 2017 through 2025. The rules helped promote a reduction in pollutants from gasoline and diesel-powered cars and helped deliver increasing numbers of zero-emission technologies, such as full battery electric vehicles (EVs), newly emerging plug-in hybrid EVs, and hydrogen fuel cell cars. The regulations also encouraged adequate fueling infrastructure.

3.2.9 CARB Heavy-Duty Diesel Vehicle Idling Information

CARB has set an airborne toxic control measure (Title 13 CCR Section 2485), which requires that drivers of diesel-fueled commercial motor vehicles with gross vehicle weight ratings greater than 10,000 pounds, including buses and heavy-duty trucks, not idle the vehicle's primary engine longer than 5 minutes in any single location.

3.2.10 California Green Building Standards, Part 11, Title 24

The California Green Building Standards Code – Part 11, Title 24 (CALGreen) is a green building standards code created in an effort for California meet the greenhouse gas reduction goals of AB 32 and SB 32. CALGreen codes have been established for residential and non-residential structures aimed at increasing water and electricity efficiency while promoting EVs and carbon reductions.

3.2.11 Kern Council of Governments Regional Transportation Plan

The California Association of Councils of Governments (CALCOG) is a 49-member agency made up of Metropolitan Planning Organizations (MPO) that serves to plan regional transportation growth across the state. The Kern Council of Governments (Kern COG) is the MPO representative for the Project area. Each COG is responsible for preparing a Regional Transportation Plan (RTP) every 4 years. The RTP is a long-term (20-year) general plan for the region's transportation network that includes projects for all types of travel (road, aviation, and freight). The latest RTP is published by Kern COG was in 2022. The goals of the 2022 RTP include the following:

- **Mobility.** Improve the mobility of people and freight
- **Accessibility.** Improve accessibility to major employment and other regional activity centers
- **Reliability.** Improve the reliability and safety of the transportation system
- **Efficiency.** Increase the efficiency of the existing and future transportation system
- **Livability.** Promote livable communities
- **Sustainability.** Minimize effects on the environment
- **Equity.** Ensure an equitable distribution of the benefits among various demographic and user groups

3.3 Local

3.3.1 Kern County General Plan

The Kern County General Plan presents a vision for the County's future, looking ahead to 2040. State law required that counties and cities adopt and periodically update a General Plan to guide land use development. The purpose of the General Plan is to encourage economic development; work with federal, state, and local agencies to plan the long-term future of Kern County; ensure the protection of environmental resources; and maintain compliance with the provisions of State Planning and Zoning Laws.

The General Plan includes the following policies related to energy resources that may be applicable to the Project (Kern County 2009):

- **Section 5.2 – Importance of Energy to Kern County**
    - **Policy 1.** Kern County should assert and promote its role as the State's leading energy County.
    - **Policy 4.** The County should actively seek State and federal energy grants and projects to assist in energy planning and development.
    - **Policy 5.** The County shall work with other agencies to define regulatory responsibility concerning energy-related issues, and shall seek to eliminate, insofar as possible, duplicative regulations.
    - **Policy 6.** The County should encourage discussion and mutual cooperation of various energy industries within the County to establish mutual understanding of common needs and issues.
    - **Policy 7.** The processing of all discretionary energy project proposals shall comply with California Environmental Quality Act (CEQA) Guidelines directing that the environmental effects of a project must be taken into account as part of project consideration.
    - **Policy 8.** The County should work closely with local, State, and federal agencies to assure that energy projects (both discretionary and ministerial) avoid or minimize direct impacts to fish, wildlife, and botanical resources, wherever practical.
    - **Policy 9.** The County should develop and implement measures which result in long-term compensation for wildlife habitat, which is unavoidably damaged by energy exploration and development activities.
- **Section 5.3.2 – Kern County's Economic Dependence on the Oil Marketplace**
    - **Policy 3.** The County shall encourage the conversion of existing petroleum-related facilities to other productive uses when they are no longer needed or productive.
    - **Policy 4.** The County should encourage the development of renewable energy industries to diversify the energy economy in Kern County.
- **Section 5.4.1 – Cogeneration**
    - **Policy 1.** The County shall allow the continued development of cogeneration facilities in primary oil resource areas and industrial areas.

4 Methodology

The following discussion explains the methodology and modeling parameters that will be used to estimate the energy demand associated with construction, operations, and decommissioning of the Project.

Project energy demand during construction, operations, and decommissioning was determined based on Project-specific information, modeling performed in the Air Quality and Greenhouse Gas Technical Study (Stantec 2025), and using vehicle and equipment emission factors from the CARB's Emission Factor 2021 model (EMFAC2021) (v1.0.2) and Off-Road Web Query (v1.1.0). The energy calculations are included as Appendix A.

The Project's energy consumption and demand were evaluated in comparison to the CEQA thresholds of significance to determine whether the Project would result in a significant impact related to energy.

4.1 Construction Assumptions

During construction, the Project would require energy in the form of petroleum fuel (gasoline and diesel) to power off-road construction equipment, generators (which power electric hand tools), and motor vehicle trips. The assumptions related to the construction schedule, use of off-road equipment, and vehicle trips are provided below.

Construction of the Project is anticipated to be completed in 24 to 30 months. The construction week would be Monday through Friday with 10-hour workdays. Initial activities are expected to start early 2027. A list of Project-specific construction equipment is provided within the energy calculations in Appendix A.

The maximum number of construction workers and indirect personnel on-site is approximately 500 people. Deliveries of mechanical and electrical equipment, as well as prefabricated piping would be required. All worker trips and cement hauling are anticipated to travel from Bakersfield, approximately 34 miles from the Project site. It was assumed up to one truck delivery would be required per day from the Port of Los Angeles, approximately 152 miles away.[2] Finally, hauling trucks would also be required for fill and material export. Fill would be acquired from two borrow site locations on the oilfield, approximately 1 mile from the CCS location. Grading cut was assumed to be exported to the McKittrick Waste Landfill (approximately 11.2 miles from the site) or Taft Landfill (approximately 6.4 miles from the site). A weighted trip length was used within the modeling.

Additionally, during construction, the Project anticipates using 1,198,000 gallons of water for civil grading, dust control via water tankers, and water needs for pipeline construction. The treatment and movement of water requires energy in the form of electricity. Electricity usages to treat and distribute water were calculated based on energy intensity factors from the CPUC (CPUC 2017).

[2] The Project is anticipated to generate 12 vendor truck trips per day. This would result in five round trips to Bakersfield and one round trip to the Port of Los Angeles. Therefore, the vendor trucks would travel an average of 55 miles per trip.

4.2 Operational Assumptions

Operational energy use refers to the energy demand that would occur during operation of the Project. The sources are summarized below.

4.2.1 Vehicle Trips

During operation, the Project is anticipated to generate roughly 40 vehicle trips per day. All delivery and worker trips were assumed to travel from Bakersfield, approximately 34 miles from the Project site. This analysis assumed a mix of gasoline-fueled, diesel-fueled, and plug-in hybrid vehicles based on vehicle use data for Kern County from CARB's EMFAC2021. The vehicle fleet mix was left as the default for the Project region, populated by CalEEMod California Emissions Estimator Model (CalEEMod). Vehicle fuel efficiency was provided by the EMFAC OFFROAD2021 database for an assumed operational year of 2029.

4.2.2 Carbon Capture and Sequestration Equipment

The Project would result in increased demand for electricity for the operation of on-site equipment, including all CCU equipment, compression and pumping equipment. Electricity demand estimates were provided by the Project proponent and are based on Project-specific equipment needs. The increase in electricity demand would be met by the on-site EHPP. This increase in natural gas that is expected to be required to meet the electrical demand was calculated by estimating the increase in fuel flow rate from similar powerplant fuel flows, natural gas emission factors, and combustion rate. This analysis assumes that the CCS would operate 24 hours per day and 7 days per week.

4.3 Decommissioning Assumptions

If CRC decides to no longer use the EHPP properties as a carbon sequestering facility, CRC would then either divest the Project or decommission the Project site facilities and wells in accordance with appliable law. Decommissioning activities would include injection well plugging and abandonment, post-injection site care, and site closure as required by U.S. EPA's UIC Program Class VI regulations, 40 CFR Parts 146.92 and 146.93 and Kern County decommissioning requirements. Post-injection testing and monitoring requirements would also be followed to monitor the CO_2 plume after injection has ceased as required by 40 CFR 46.90. Removal of surface facilities would be obtained from Kern County in accordance with permits issued that relate to CCS projects. In lieu of removal, surface facilities potentially may be re-purposed for other site uses in accordance with applicable law. Any surface facility removal activities would be limited to removal or demolition of existing equipment and performed in accordance with applicable law.

Decommissioning would likely involve the same activities as construction but would occur later in time when vehicle and off-road emissions are expected to decrease due to increasingly stringent state regulations. As a result, actual decommissioning energy demand is expected to be less than construction. However, this analysis conservatively assumes that decommissioning would generate the same demand for energy resources as construction of the Project.

5 Energy Analysis

5.1 CEQA Guidelines

In accordance with the CEQA Guidelines Appendix G Environmental Checklist,[3] the following questions are to be analyzed and evaluated to determine whether impacts related to energy are significant. Where available, the significance criteria established by the applicable air quality management or air pollution district may be relied upon to make the following determinations. Would the proposed project:

a. Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

b. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

5.2 Energy Impact Analysis

Impact ENG-1	**Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?**

5.2.1 Impact Analysis

Less than Significant Impact. The energy requirements for the Project were determined using estimates generated from the calculation worksheets for energy consumption (Appendix A) and the modeling within the Project's air quality impact analysis (Stantec 2025). This impact addresses the energy consumption from construction, operations, and decommissioning, each discussed separately below.

5.2.1.1 Construction and Decommissioning

During the temporary construction and decommissioning of the Project, energy resources would be consumed in the form of diesel and gasoline fuel from the use of off-road equipment (e.g., tractors, excavators, cranes) and on-road vehicles (e.g., construction employee commutes, vendors, haul trucks) and electricity from water demand.

Electricity

Temporary electricity may be required to provide as-necessary lighting and electric equipment; such electricity demand would be met by portable generator sets and, possibly, connections to an on-site power facility. Fuel demand associated with portable generators is incorporated in the off-road equipment estimate provided below. Additionally, electricity would be used to treat and distribute the water for

[3]Appendix G Environmental Checklist Form, Guidelines for the Implementation of the California Environmental Quality Act, 2023

construction. The Project would require 1,198,000 gallons of water, resulting in the use of 2,168 kilowatt-hours (kWh) of electrical demand.

Off-Road Equipment

Construction activities associated with the Project were estimated to consume 38,573 gallons of diesel fuel from the use of off-road equipment. For comparison, in 2024, approximately 2.7 billion gallons of diesel fuel was consumed within California (CDTFA 2025a). Thus, the diesel fuel required during construction of the Project would represent approximately 0.0014 percent of the state's annual diesel demand. For the purposes of this analysis, it was assumed that all off-road construction equipment would be diesel fueled. In the event that some are alternatively fueled or electric, the percentage of diesel demand would be further reduced. Additionally, any alternative fuel or electricity use from the off-road construction equipment would similarly be assumed to be minor as compared to statewide consumption.

Decommissioning of the Project is assumed to involve similar activities as construction but would occur later in time when equipment is expected to be more fuel-efficient and less dependent on petroleum-based fuels. For example, CARB has implemented the Clean Off-Road Equipment Voucher Incentive Program to subsidize the purchase or lease of zero-emission off-road equipment (CARB 2025c). With the ongoing implementation of this program, off-road construction fleets in California are expected to transition towards electric equipment. It is noted, however, that statewide diesel use is anticipated to also be lower when decommissioning takes place due to future regulations, including amendments to the CARB's Diesel Engine Off-Road Emission Standards. From 2016 to 2024, the average annual decline in diesel fuel sales in California was approximately 0.12 percent (CDTFA 2025c). Therefore, assuming the state continues to follow this trend over the next 30 years, the total diesel fuel consumed within California would be approximately 2.6 billion gallons per year. As such, assuming the decommissioning continues to use all diesel fueled equipment, the Project would represent approximately 0.0015 percent of the state's annual diesel demand. As a result, the Project's estimated fuel use may constitute a larger percentage of the state's annual fuel demand in the decommissioning year, but it is still anticipated to be a relatively low percentage because Project fuel use would similarly decline.

On-Road Vehicles

On-road vehicles for construction workers, vendors, on-site trucks, and haul trucks would require fuel for travel to and from the site during construction. Table 2 provides an estimate of the total on-road vehicle fuel usage during construction.

Table 2 Construction On-Road Vehicle Fuel Consumption

Trip Type	Average Daily Trips*	Average Fuel Economy (miles/gallon)	Total Vehicle Miles Traveled	Total Fuel Consumption (gallons)
Worker Trips	1,000	28.46	17,714,000	622,487
Vendor Trips	12	7.82	343,860	43,976
Haul Trips	**	6.41	53,337	8,318
Total Construction On-Road Trips***			***18,111,197***	***674,781***

Notes:
* Average daily trips were derived from the Air Quality and Greenhouse Gas Technical Assessment and the Traffic Impact Assessments prepared by Stantec.
** During Phase 1 Project Construction (Initial Site Preparation, Foundation) the Project would result in an average of 20.5 hauling truck trips per day for grading fill and export. During Phase 2 Project Construction (Equipment Installation) the Project would result in an average of 2 trucks per day from concrete hauling.
*** Calculations use unrounded numbers; totals may not appear to sum exactly due to rounding.
Source: Appendix A.

As shown in Table 3, construction of the Project was estimated to consume 674,781 gallons of a combination of gasoline and diesel fuel from on-road vehicles. For comparison, in 2024, approximately 2.7 billion gallons of diesel fuel and 12.3 billion gallons of gasoline were sold within California (CDTFA 2025a, 2025b). Thus, the fuel required to power the on-road motor vehicles during construction of the Project would represent approximately 0.0045 percent of the state's annual diesel and gasoline demand.

Future decommissioning of the Project is expected to generate a similar amount of vehicle trips but would occur later in time when vehicles are expected to be more fuel-efficient due to increasingly stringent state regulations governing motor vehicle fuel efficiency, such as the CARB's Advances Clean Fleets Regulation. Similar to the discussion above, statewide gasoline use is anticipated to be substantially lower when decommissioning takes place due to future regulations. As a result, the Project's estimated fuel use may constitute a larger percentage of the state's annual fuel demand in the decommissioning year but is still anticipated to be a relatively low percentage because Project fuel use is temporary and would similarly decline.

Conclusion

Overall, construction and decommissioning activities associated with the proposed Project would result in the consumption of petroleum-based fuels. However, there are no unusual Project characteristics that would necessitate the use of equipment or vehicles that would be less energy efficient than at comparable construction sites in other parts of the state. The project proponent and contractors have a financial incentive to minimize fuel and energy use in construction. The Project would comply with all rules and regulations pertaining to the reduction of air emissions that would also reduce petroleum fuel use. Specifically, the Project would comply with CARB's 5-minute idling rule and all off-road vehicles would be required to be report vehicle inventories through the Off-Road Diesel Regulation. Moreover, as discussed above, the Project's diesel and gasoline demands from construction would be minimal compared to statewide demand. The analysis above also conservatively assumed all diesel and petroleum off-road equipment. However, construction may use alternatively fueled or electric construction

equipment. The use of this equipment would reduce petroleum fuel demand but there is limited availability as compared to diesel fueled equipment. As such, any off-road energy demand from the alternative fuels or electricity would continue to be minimal. Transportation fuel demand would also be minimal compared to statewide use. Moreover, as further discussed under Impact Energy-2, the Project's fleet would be required to comply with stricter vehicle standards over time, thereby reducing fuel use. For these reasons, construction and decommissioning fuel consumption associated with the Project would not be inefficient, wasteful, or unnecessary.

5.2.1.2 Operation

During operations of the Project, energy would be required to fuel the vehicles travelling to and from the Project site.

Transportation Energy Demand

During operation, the Project would require trips for on-site staff and regular material deliveries. Table 3 provides an estimate of the annual fuel consumed by vehicles traveling to and from the Project site. As shown in Table 3, annual vehicular fuel consumption is estimated to be 20,577 gallons of motor vehicle fuel.

Table 3 Operational On-Road Vehicle Fuel Consumption

Trip Type	Average Daily Vehicle Trips	Average Fuel Economy (miles/gallon)	Annual Vehicle Miles Traveled	Total Annual Fuel Consumption (gallons)
Passenger Cars)	17	34.04	203,484	5,977
Light Trucks and Medium Vehicles	18	25.45	207,352	8,147
Light-Heavy to Heavy-Heavy Diesel Trucks	4	7.95	46,494	5,851
Motorcycles	0.8	42.34	9,371	221
Other	0.2	7.08	2,699	381
Project Total	***40***	***-***	***496,400***	***20,577***

Source: Appendix A

As noted previously, in 2024, approximately 2.7 billion gallons of diesel fuel and 12.3 billion gallons of gasoline were sold within California (CDTFA 2025a, 2025b). Thus, if we sum the total diesel and gasoline fuel sold in the state in 2024, then the fuel required to power the on-road motor vehicles during operation of the Project would represent approximately 0.0001 percent of the state's annual diesel and gasoline demand. Further, over the lifetime of the Project, the fuel efficiency of the vehicles being used for deliveries is expected to increase. As such, the amount of petroleum consumed for vehicular trips to and from the Project site during operation would decrease over time.

Carbon Capture and Sequestration Equipment Energy Demand

The Project includes a single connection to the CRC Power System and would include a connection of a new 115-kV line to a new CRC electrical substation. The Project would require a new transmission tie line to connect the Project switching station to the existing CRC substation. Electrical power would be supplied to the CalCapture Substation with a new dedicated electrical transformer.

On average, EHPP currently operates at approximately 475 megawatts (MW). Approximately 150 MW is generated by each of two gas turbine generators, and approximately 175 MW is generated from the hot gas turbine exhaust via heat recovery steam generators and a steam turbine generator. The CCS is anticipated to require approximately 35-40 MW of electric load during operation. The CCS will also use a portion of the steam currently sent to the steam turbine generator, reducing the steam turbine's electrical generation by approximately 35-50 MW. The electrical and steam load for CCS will come from typical historical EHPP operation levels, and total fuel consumption is not expected to increase. Therefore, there would not be an increase in on-site emissions from electricity production as compared to baseline conditions.

Supplemental Boiler

The Project may require a supplemental boiler with a rating of 160 million British thermal units per hour (MMBtu/hour). The boiler would require 1.4 million MMBtu per year or 140,000 therms of natural gas. In 2022, Kern County used a total of 1,774 million therms of natural gas. Therefore, the Project would use approximately 0.008% of the County's demand of natural gas. It should be noted that the boiler would be subject to SJVAPCD permitting and rules and regulations.

5.2.1.3 Conclusion

Based on the analysis above, the Project would consume energy resources during operation. The Project would result in less overall electricity provided to the PG&E grid due to the CCS Project's demand of approximately 70-90 MW_e (35-40 MW of electric load and 35-50 MW of steam generated electricity), as well as due to the planned CCS project capacity, and desire to produce the lowest carbon intensity power to consumers. However, the EHPP has historically only run at about 475 MW gross generation and will retain the capability of close to full nameplate 550 MW_e gross generation should it be needed. Also, PG&E buys and distributes electricity to consumers; therefore, in combination with the electricity generated and electricity purchased, the loss in electrical generation to PG&E would be an insignificant fraction. The Project would only operate under power from the EHPP. PG&E backup power would only be required for turnaround loads such as air conditioning in electrical buildings. However, the energy consumption associated with the proposed Project's operations would not be inefficient, wasteful, or unnecessary, and a less-than-significant impact would occur.

Impact ENG-2 Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

5.2.2 Impact Analysis

Less than Significant Impact. The following discussion evaluates Project consistency with applicable plans for renewable energy or energy efficiency during construction, operations, and decommissioning.

5.2.2.1 Construction and Decommissioning

During both construction and decommissioning activities, off-road equipment and on-road vehicles would comply with applicable federal, state, and local requirements governing fuel efficiency. For example, off-road equipment would be subject to the most recent In-Use Off-Road Diesel-Fueled Fleets Regulations adopted by the CARB, which establish engine efficiency requirements, among other requirements (CARB 2025b). Off-road engines are categorized per engine tier, with Tier 0 being the least efficient and Tier 4 Final being the cleanest and most efficient. The most recent amendments to the rule are adding an even cleaner Tier 5 engine requirement. Compliance with the In-Use Off-Road Diesel-Fueled Fleets Regulations would ensure that the Project construction and decommissioning fleets consist of energy-efficient engines.

With respect to the on-road vehicle fleet operations, the U.S. EPA and NHTSA have adopted Federal Vehicle Standards with which the Project would comply. The on-road construction and decommissioning fleets would incorporate these standards as they purchase newer model trucks and turn over their fleet. As such, these regulations would have an overall beneficial effect on reducing nationwide fuel consumption over time as older trucks are replaced. Compliance with this regulation would further reduce the demand for petroleum fuels. Moreover, heavy-duty trucks would be required to comply with CARB's 5-minute idling limits, which would reduce fuel consumption. Although the foregoing regulations were primarily designed to reduce air quality emissions, they would also result in an increase in energy efficiency during construction and decommissioning activities.

5.2.2.2 Operation

California adopted the RPS to increase the amount of renewable energy supplied by utilities within the state. As noted previously, the Project would primarily use electricity generated on-site but would have a backup connection to the PG&E grid for small turnaround loads. PG&E will continue to be subject to state RPS requirements, and the Project would not preclude achievement of the RPS goals. In addition, any new structures developed as part of the Project would comply with federal, state, and local regulations aimed at reducing energy consumption, including the Building Energy Efficiency Standards (Title 24 CCR Part 6) and CALGreen (Title 24 CCR Part 11). Moreover, the Project directly supports the goals laid out in CARB's 2022 Scoping Plan, including the measures related to carbon capture and sequestration. Finally, the Project could apply for carbon credits under the CARB's Carbon Capture and Sequestration Protocol under the LCFS (CARB 2018). The LCFS requirements are designed to decrease the carbon intensity of fuels and increase the range of renewable alternatives; therefore, the Project's compliance with CARB's Carbon Capture and Sequestration Protocol would indirectly support the state plan for renewable energy.

The Project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency; therefore, the impact would be less than significant.

6 Cumulative Impacts

The geographic scope of cumulative energy impacts is PG&E service area for electricity and natural gas and the State of California for petroleum. Other past, present, and reasonably foreseeable future oil and gas development projects, including wells and abandonment activity and other CCS projects, would constitute a cumulative impact.

The main contribution of energy consumption from the Project would be construction equipment usage, haul trips, and employee trips during the construction phase, and employee and delivery trips during Project operation. However, construction energy demand would be finite and temporary, ceasing at the end of construction activities. As discussed in Impact ENG-1, the Project's fuel demand would be minimal compared to statewide demand. Construction of the Project would be similar in petroleum fuel demand as other projects within the County. The fuel required to power the on-road motor vehicles and off-road equipment during construction of the Project would represent approximately 0.0048 percent of the state's annual diesel and gasoline demand. Even in the event that 100 similar projects are constructed simultaneously, the overall petroleum fuel demand would be less than half a percent of the annual statewide demand. Therefore, the cumulative impact from the Project during construction would be less than significant.

The Project would utilize electricity generated by the EHPP; therefore, that amount of power (70-90MWe) would not be available to the grid and would not be available to other past, present, and reasonably foreseeable future projects. However, PG&E can buy power from other sources, so this amount is an insignificant amount for the total grid usage. Additionally, other future oil and gas development projects would likely require minimal electricity and natural gas, either producing it on the site or using petroleum fuel to power on-site equipment. As stated above, the annual petroleum fuel demand from the Project would be minimal, representing 0.0001 percent of the state's annual diesel and gasoline demand. Other CCS projects would have similar demands and continue to be minimal when combined. Other oil and gas development projects may increase fuel production therefore reducing the cumulative percentage of demand. The Project would implement Mitigation Measure (MM) ENG-1 that requires the tracking of the Project's energy efficiency and consumption to ensure proper energy planning across the region. Compliance with the mitigation would require an annual report of electricity consumption for all Project sources permitted to provide CO_2 for injection and storage and an evaluation of any methods to reduce the consumption of any forms of electricity in the capture process. The Project's contribution would not result in a cumulative impact in any wasteful consumption of energy and would comply with all applicable energy reduction plans, the Project would be less than significant with mitigation.

7 Mitigation Measures

The following mitigation measures (MMs) are proposed for the Project to reduce cumulative energy impacts to less than significant.

MM ENG-1: Electricity Reporting. The operator shall provide an annual report on the total amount of electricity consumed by the carbon capture facilities associated with sources that send CO_2 for injection into the project storage site. The report shall detail the facility the source of the power and the annual amount. The report shall include a discussion of modifications that are being considered by each source to reduce electricity use. The first report is due the 13th month after the first month injection commences. The report shall be provided to Kern County, U.S, EPA UIC Permit Division, CARB, CPUC, CEC, and California Independent System Operators. This reporting requirement will be combined with the CTV I energy reporting.

8 References

California Air Resources Board (CARB). 2018. Carbon Capture and Sequestration Protocol under the Low Carbon Fuel Standard. Available online at: https://ww2.arb.ca.gov/sites/default/files/2020-03/CCS_Protocol_Under_LCFS_8-13-18_ada.pdf. Accessed March 2025.

_____. 2022. 2022 Scoping Plan for Achieving Carbon Neutrality. Available online at: https://ww2.arb.ca.gov/sites/default/files/2022-12/2022-sp_1.pdf. Accessed March 2025.

_____. 2025a. Low Carbon Fuel Standard. Available online at: https://ww2.arb.ca.gov/our-work/programs/low-carbon-fuel-standard/about. Accessed March 2025.

_____. 2025b. In-Use Off-Road Diesel-Fueled Fleets Regulation. Available online at: https://ww2.arb.ca.gov/our-work/programs/use-road-diesel-fueled-fleets-regulation/about. Accessed March 2025.

_____. 2025c. Clean Off-Road Equipment Vouchers. Available online at: https://ww2.arb.ca.gov/our-work/programs/clean-off-road-equipment-voucher-incentive-project. Accessed March 2025.

California Department of Tax and Fee Administration (CDTFA). 2025a. Fuel Taxes Statistics & Reports; Taxable Diesel Gallons 10 Year Report. Available online at: https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.cdtfa.ca.gov%2Ftaxes-and-fees%2FDiesel-10-Year-Report.xlsx&wdOrigin=BROWSELINK. Accessed March 2025.

_____. 2025b. Fuel Taxes Statistics & Reports; Net Taxable Gasoline Gallons (Including Aviation Gasoline). Available online at: https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.cdtfa.ca.gov%2Ftaxes-and-fees%2FMVF-10-Year-Report.xlsx&wdOrigin=BROWSELINK. Accessed March 2025.

California Energy Commission (CEC). 2016a. Electricity Consumption by County. Available online at: http://www.ecdms.energy.ca.gov/elecbycounty.aspx. Accessed March 2025.

_____. 2016b. Gas Consumption by County. Available online at: http://www.ecdms.energy.ca.gov/gasbycounty.aspx. Accessed March 2025.

_____. 2023. 2023 Integrated Energy Policy Report. Available online at: https://www.energy.ca.gov/data-reports/reports/integrated-energy-policy-report-iepr/2023-integrated-energy-policy-report. Accessed March 2025.

_____. 2025. 2022 Power Content Label, Pacific Gas and Electric Company. Available online at: https://www.energy.ca.gov/filebrowser/download/6048. Accessed March 2025.

California Public Utilities Commission (CPUC). 2025. Renewables Portfolio Standard (RPS) Program. Available online at: https://www.cpuc.ca.gov/rps. Accessed March 2025.

_____. 2017. Implementation of the Public Utilities Commission's Water-Energy Calculator. Available online at: https://waterenergyinnovations.com/wp-content/uploads/2020/03/FINAL-W-E-White-Paper-20170417.pdf. Accessed June 2025.

Kern County. 2009. General Plan 2040. Available online at: https://psbweb.co.kern.ca.us/planning/pdfs/kcgp/KCGP_Complete.pdf Accessed March 2025.National Highway Traffic Safety Administration (NHTSA). 2024. USDOT Finalizes New Fuel Economy Standards for Model Years 2027-2031. Available online at: https://www.nhtsa.gov/press-releases/new-fuel-economy-standards-model-years-2027-2031. Accessed March 2025.

Pacific Gas and Electric (PG&E). 2018. News & Events: PG&E Clean Energy Deliveries Already Meet Future Goals. Available online at: https://investor.pgecorp.com/news-events/press-releases/press-release-details/2018/PGE-Clean-Energy-Deliveries-Already-Meet-Future-Goals/default.aspx. Accessed March 2025.

_____. 2025a. 2024 Corporate Sustainability Report. Available online at: https://www.pgecorp.com/assets/pgecorp/csr/csr_2024/assets/pge-csr-2024.pdf. Accessed June 2025.

_____. 2025b. Company Profile. Available online at: https://www.pge.com/en/about/company-information/company-profile.html. Accessed March 2025.

Stantec. 2025. CalCapture CCS Project Air Quality and Greenhouse Gas Technical Study.

U.S. Energy Information Administration. 2025. Total Petroleum Consumption Estimates, 2022. Available online at: https://www.eia.gov/state/seds/data.php?incfile=/state/seds/sep_fuel/html/fuel_use_pa.html&sid=US&sid=CA. Accessed March 2025.

U.S. Environmental Protection Agency (U.S. EPA). 2023. EPA Marks One Year of Progress Under President Biden's Inflation Reduction Act. Available online at: https://www.epa.gov/newsreleases/epa-marks-one-year-progress-under-president-bidens-inflation-reduction-act. Accessed March 2025.

Appendices

Appendix A Energy Calculations

CalCapture Project — Energy Consumption Summary

Date of Last Revision: March 2025

Summary of Energy Use During Construction		(Annually)
Construction vehicle fuel	674,781	gallons (gasoline, diesel)
Construction equipment fuel	38,573	gallons (diesel)
Construction Electricity Use	2,168	kWh

Summary of Energy Use During Proposed Operations		(Annually)
Operational vehicle fuel consumption	20,577	gallons (gasoline, diesel)
Operational electricity consumption	3.84	MW

Construction Vehicle Fuel Calculations (Page 1 of 2)

California Air Resource Board (CARB). 2025. EMFAC2021 Web Database. Accessed March 2025.

Source: EMFAC2021 (v1.0.2) Emissions Inventory
Region Type: County
Region: Kern
Calendar Year: 2027, 2028, 2029
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Units: miles/day for CVMT and EVMT, trips/day for Trips, kWh/day for Energy Consumption, tons/day for Emissions, 1000 gallons/day for Fuel Consumption

VMT = Vehicle Miles Traveled
FE = Fuel Economy

						Given			*Calculations*	
Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	Population	VMT (mi/day)	Fuel Consumption (1000 gallons/day)	FE (mi/gallon)	VMT*FE
Kern	2027	HHDT	Aggregate	Aggregate	Gasoline	1.573555	155.2767	0.038731317	4.00907356	622.5157
Kern	2027	HHDT	Aggregate	Aggregate	Diesel	31025.6	4830455	752.446232	6.41966789	31009916
Kern	2027	HHDT	Aggregate	Aggregate	Natural Ga	453.75368	29238.9	5.632705762	5.19091468	151776.6
Kern	2027	LDA	Aggregate	Aggregate	Gasoline	333593.36	12978575	413.1932807	31.4104205	4.08E+08
Kern	2027	LDA	Aggregate	Aggregate	Diesel	807.65928	25320.87	0.555719214	45.5641513	1153724
Kern	2027	LDA	Aggregate	Aggregate	Plug-in Hyb	11425.884	508392	7.73006958	65.7681017	33435977
Kern	2027	LDT1	Aggregate	Aggregate	Gasoline	31897.968	1076095	41.45689026	25.9569551	27932140
Kern	2027	LDT1	Aggregate	Aggregate	Diesel	5.5226177	72.36845	0.002868906	25.2251052	1825.502
Kern	2027	LDT1	Aggregate	Aggregate	Plug-in Hyb	100.5429	5042.98	0.070080702	71.9596046	362890.8
Kern	2027	LDT2	Aggregate	Aggregate	Gasoline	180712.55	7179072	277.9314131	25.8303713	1.85E+08
Kern	2027	LDT2	Aggregate	Aggregate	Diesel	591.23646	24814.93	0.688748725	36.0290017	894057.1
Kern	2027	LDT2	Aggregate	Aggregate	Plug-in Hyb	2092.3743	99194.63	1.448298563	68.4904584	6793886
Kern	2027	LHDT1	Aggregate	Aggregate	Gasoline	15808.048	574211	57.76052636	9.94123494	5708366
Kern	2027	LHDT1	Aggregate	Aggregate	Diesel	14181.716	494859.4	31.17439911	15.8739025	7855349
Kern	2027	LHDT2	Aggregate	Aggregate	Gasoline	2783.3511	93512.5	10.81319202	8.6480014	808696.2
Kern	2027	LHDT2	Aggregate	Aggregate	Diesel	6439.0475	225370.7	17.14425861	13.1455501	2962622
Kern	2027	MDV	Aggregate	Aggregate	Gasoline	150050.58	5369654	262.1190036	20.4855571	1.1E+08
Kern	2027	MDV	Aggregate	Aggregate	Diesel	2339.1611	83299.01	3.268247002	25.4873657	2123072
Kern	2027	MDV	Aggregate	Aggregate	Plug-in Hyb	1453.4713	66111.89	1.001639402	66.0036837	4363628
Kern	2027	MHDT	Aggregate	Aggregate	Gasoline	1158.4233	73833.74	15.22520972	4.8494402	358052.3
Kern	2027	MHDT	Aggregate	Aggregate	Diesel	10756.789	515068.2	57.6033819	8.94163112	4605550
Kern	2027	MHDT	Aggregate	Aggregate	Natural Ga	92.185233	4552.806	0.637322787	7.14364173	32523.61

Worker (LDA, LDT, MDV
Sum of VMT*FE (Column BI) 7.8E+08
Total VMT 27415643
Weighted Average Fuel Economy 28.45682

Vendor (HHDT, LHDT, M
Sum of VMT*FE (Column BI) 53493475
Total VMT 6841257
Weighted Average Fuel Economy 7.819246

Haul (HHDT)
Sum of VMT*FE (Column BI) 31162315
Total VMT 4859849
Weighted Average Fuel Economy 6.412198

Construction Vehicle Fuel Calculations (Page 2 of 2)

Construction Schedule

CalEEMod Phase Type	Phase Name	Start Date	End Date	Num Days Week	Num Days
Site Preparation	P1 - Initial Site Prep, Foundatio	1/1/2027	1/27/2028	5	280
Building Construction	P2 - Equipment Installation	1/1/2027	12/29/2028	5	521

Construction Trips and VMT

Phase Name	One-Way Trips per Day			Construction Trip Length in Miles			Number of Days per Phase	Trips per Phase			VMT per Phase			Fuel Consumption (gallons)		
	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length		Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trips	Vendor Trips	Hauling Trips	Worker Trips	Vendor Trips	Hauling Trips
P1 - Initial Site Prep, Foundation	0.0	0.0	20.5	34	43	3.115	280	0	0	5,750	0	0	17,909	0.00	0.00	2,793.02
P2 - Equipment Installation	1000.0	12.0	2.0	34	55	34	521	521,000	6,252	1,042	17,714,000	343,860	35,428	622,486.91	43,976.11	5,525.09
										Project-wide Total	*17,714,000*	*343,860*	*53,337*	*622,487*	*43,976*	*8,318*
													18,111,197			674,781

Total Project Construction VMT (miles)
18,111,197

Total Project Fuel Consumption (gallons)
674,781

Construction Equipment Fuel Calculation

Construction Schedule

CalEEMod Phase Type	Phase Name	Start Date	End Date	Num Days Week	Num Days
Site Preparation	P1 - Initial Site Prep, Foundations, and Underground Work	1/1/2027	1/27/2028	5	280
Building Construction	P2 - Equipment Installation	1/1/2027	12/29/2028	5	521

Construction Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor	Number of Days	HP Hours	HP Bin	Equipment Type + HP	Fuel (gallons/HP-hour)	Diesel Fuel Usage
P1 - Initial Site Prep, Foundations, and Underground Work	Off-Highway Trucks	1	0.2	500	0.38	280	10,640.00	600	Off-Highway Trucks 600	0.04992043	531.15
P1 - Initial Site Prep, Foundations, and Underground Work	Tractors/Loaders/Backhoes	1	1.1	120	0.37	280	13,675.20	175	Tractors/Loaders/Backhoes 175	0.05079394	694.62
P1 - Initial Site Prep, Foundations, and Underground Work	Skid Steer Loaders	1	2.1	120	0.37	280	26,107.20	175	Skid Steer Loaders 175	0.05061882	1,321.52
P1 - Initial Site Prep, Foundations, and Underground Work	Bore/Drill Rigs	1	1.5	50	0.5	280	10,500.00	50	Bore/Drill Rigs 50	0.05608047	588.84
P1 - Initial Site Prep, Foundations, and Underground Work	Off-Highway Trucks	1	0.2	500	0.38	280	10,640.00	600	Off-Highway Trucks 600	0.04992043	531.15
P1 - Initial Site Prep, Foundations, and Underground Work	Cranes	2	0.4	750	0.29	280	48,720.00	750	Cranes 750	0.05050286	2,460.50
P1 - Initial Site Prep, Foundations, and Underground Work	Graders	1	0.7	120	0.41	280	9,643.20	175	Graders 175	0.05530543	533.32
P1 - Initial Site Prep, Foundations, and Underground Work	Rollers	1	1	120	0.38	280	12,768.00	175	Rollers 175	0.05085933	649.37
P1 - Initial Site Prep, Foundations, and Underground Work	Skid Steer Loaders	1	0.8	120	0.37	280	9,945.60	175	Skid Steer Loaders 175	0.05061882	503.43
P1 - Initial Site Prep, Foundations, and Underground Work	Excavators	1	0.2	250	0.38	280	5,320.00	300	Excavators 300	0.05032723	267.74
P1 - Initial Site Prep, Foundations, and Underground Work	Tractors/Loaders/Backhoes	2	2.3	120	0.37	280	57,187.20	175	Tractors/Loaders/Backhoes 175	0.05079394	2,904.76
P1 - Initial Site Prep, Foundations, and Underground Work	Welders	1	0.3	50	0.45	280	1,890.00	50	Welders 50	0.05390609	101.88
P2 - Equipment Installation	Aerial Lifts	1	0.9	75	0.31	521	10,901.93	75	Aerial Lifts 75	0.05657977	616.83
P2 - Equipment Installation	Off-Highway Trucks	1	1.9	250	0.38	521	94,040.50	300	Off-Highway Trucks 300	0.04978636	4,681.93
P2 - Equipment Installation	Cranes	1	2.2	120	0.29	521	39,887.76	175	Cranes 175	0.06304692	2,514.80
P2 - Equipment Installation	Cranes	1	2.6	175	0.29	521	68,745.95	175	Cranes 175	0.06304692	4,334.22
P2 - Equipment Installation	Cranes	1	0.8	250	0.29	521	30,218.00	300	Cranes 300	0.05426549	1,639.79
P2 - Equipment Installation	Cranes	1	0.7	250	0.29	521	26,440.75	300	Cranes 300	0.05426549	1,434.82
P2 - Equipment Installation	Cranes	1	0.6	500	0.29	521	45,327.00	600	Cranes 600	0.05157611	2,337.79
P2 - Equipment Installation	Rough Terrain Forklifts	1	1.1	175	0.2	521	20,058.50	175	Rough Terrain Forklifts 175	0.06760563	1,356.07
P2 - Equipment Installation	Rough Terrain Forklifts	1	1.1	120	0.2	521	13,754.40	175	Rough Terrain Forklifts 175	0.06760563	929.87
P2 - Equipment Installation	Aerial Lifts	1	2	50	0.31	521	16,151.00	50	Aerial Lifts 50	0.05674691	916.52
P2 - Equipment Installation	Off-Highway Trucks	1	2.1	220	0.38	521	91,466.76	300	Off-Highway Trucks 300	0.04978636	4,553.80
P2 - Equipment Installation	Off-Highway Trucks	1	1	220	0.38	521	43,555.60	300	Off-Highway Trucks 300	0.04978636	2,168.47
										Total	*38,573.22*

Notes:
Equipment assumptions are provided in the CalEEMod output files.
Source of fuel efficiency rates: https://arb.ca.gov/emfac/offroad/emissions-inventory/. Accessed March 2025.

State 2,700,000,000
0.00143%

Model Output: Off-Road Web Query (v1.1.0) Emissions Inventory
Region Type: County
Region: Kern
Calendar Year: 2027, 2028
Scenario: All Adopted Rules - Exhaust
Vehicle Classification: Off-Road Web Query Equipment Types
Units: tons/day for Emissions, gallons/year for Fuel, hours/year for Activity, Horsepower-hours/year for Horsepower-hours

Region	Calendar Y	Vehicle Class + HP Bin	Model Year	Fuel	Fuel Consumption (gallons/year)	Horsepower Hours (HP-hours/year)	Fuel (gallons/HP-hour)
Kern	2027	Bore/Drill Rigs 100	Aggregate	Diesel	5738.177943	101569.1599	0.056495278
Kern	2027	Bore/Drill Rigs 175	Aggregate	Diesel	40580.29942	809917.7058	0.050104226
Kern	2027	Bore/Drill Rigs 300	Aggregate	Diesel	48585.92529	973720.0413	0.049897222
Kern	2027	Bore/Drill Rigs 50	Aggregate	Diesel	1923.435587	34297.7822	0.056080465
Kern	2027	Bore/Drill Rigs 600	Aggregate	Diesel	69756.30362	1405731.805	0.049622768
Kern	2027	Bore/Drill Rigs 75	Aggregate	Diesel	7402.435137	131347.3579	0.056357701
Kern	2027	Bore/Drill Rigs 750	Aggregate	Diesel	28817.11699	577613.3187	0.04988998
Kern	2027	Bucket 100	Aggregate	Diesel	440.889268	7861.726274	0.056080465
Kern	2027	Bucket 175	Aggregate	Diesel	704.4693467	13965.11739	0.050444928
Kern	2027	Bucket 300	Aggregate	Diesel	1834.140441	36359.26343	0.050444928
Kern	2027	Bucket 50	Aggregate	Diesel	150.6861207	2686.962737	0.056080465
Kern	2027	Bucket 75	Aggregate	Diesel	425.8527399	7593.602105	0.056080465
Kern	2027	Bucket 750	Aggregate	Diesel	1463.434621	29010.54015	0.050444928
Kern	2027	Compactor 100	Aggregate	Diesel	205.8428976	3670.491966	0.056080465
Kern	2027	Compactor 175	Aggregate	Diesel	3562.27931	70617.19429	0.050444928
Kern	2027	Compactor 300	Aggregate	Diesel	910.3907511	18047.2206	0.050444928
Kern	2027	Compactor 50	Aggregate	Diesel	219.0327871	3905.687759	0.056080465
Kern	2027	Compactor 600	Aggregate	Diesel	2337.140798	46796.28177	0.049942874
Kern	2027	Compactor 75	Aggregate	Diesel	235.6554405	4202.094954	0.056080465
Kern	2027	Concrete Mixer 175	Aggregate	Diesel	201.8378224	4001.151925	0.050444928
Kern	2027	Concrete Mixer 300	Aggregate	Diesel	241.3509798	4784.444888	0.050444928
Kern	2027	Concrete Mixer 50	Aggregate	Diesel	100.1241151	1785.365269	0.056080465
Kern	2027	Concrete Mixer 600	Aggregate	Diesel	187.1100929	3709.195331	0.050444928
Kern	2027	Concrete Mixer 75	Aggregate	Diesel	27.74374846	494.7132354	0.056080465
Kern	2027	Concrete Pump 100	Aggregate	Diesel	191.9870319	3184.777845	0.060282708
Kern	2027	Concrete Pump 175	Aggregate	Diesel	3094.937523	61352.79841	0.050444928
Kern	2027	Concrete Pump 300	Aggregate	Diesel	1238.353679	24548.62595	0.050444928
Kern	2027	Concrete Pump 50	Aggregate	Diesel	17.2087506	306.8581989	0.056080465
Kern	2027	Concrete Pump 600	Aggregate	Diesel	2967.897383	58834.40569	0.050444928
Kern	2027	Concrete Pump 75	Aggregate	Diesel	202.8379397	3616.998995	0.056080465
Kern	2027	Crane less than 35ton 100	Aggregate	Diesel	289.8374394	5168.242408	0.056080465
Kern	2027	Crane less than 35ton 175	Aggregate	Diesel	2051.830239	36177.54137	0.05671558
Kern	2027	Crane less than 35ton 300	Aggregate	Diesel	543.947902	10783.00474	0.050444928
Kern	2027	Crane less than 35ton 50	Aggregate	Diesel	156.4152775	2789.122316	0.056080465
Kern	2027	Crane less than 35ton 600	Aggregate	Diesel	418.815452	8302.425307	0.050444928
Kern	2027	Crane less than 35ton 75	Aggregate	Diesel	298.4474313	4655.935109	0.064100428
Kern	2027	Crane less than 35ton 750	Aggregate	Diesel	93.44634669	1852.442845	0.050444928
Kern	2027	Cranes 100	Aggregate	Diesel	2749.162162	32583.20335	0.0843736
Kern	2027	Cranes 175	Aggregate	Diesel	21266.87489	337318.2398	0.063046916
Kern	2027	Cranes 300	Aggregate	Diesel	65486.62413	1206782.202	0.054265487
Kern	2027	Cranes 50	Aggregate	Diesel	263.6713056	2641.190399	0.09983048
Kern	2027	Cranes 600	Aggregate	Diesel	90175.44148	1748395.671	0.051576107
Kern	2027	Cranes 75	Aggregate	Diesel	1116.399545	11249.10263	0.099243431
Kern	2027	Cranes 750	Aggregate	Diesel	13928.08837	275788.0894	0.050502864
Kern	2027	Crawler Tractors 100	Aggregate	Diesel	30295.44604	510544.1157	0.059339526
Kern	2027	Crawler Tractors 175	Aggregate	Diesel	107467.1508	2105282.327	0.051046432
Kern	2027	Crawler Tractors 300	Aggregate	Diesel	132586.8959	2616215.852	0.050678883
Kern	2027	Crawler Tractors 50	Aggregate	Diesel	1289.473334	17650.26285	0.073056891
Kern	2027	Crawler Tractors 600	Aggregate	Diesel	230588.582	4683879.705	0.049230253
Kern	2027	Crawler Tractors 75	Aggregate	Diesel	7961.058067	129983.9194	0.061246484
Kern	2027	Crawler Tractors 750	Aggregate	Diesel	14969.34896	317624.5221	0.047100737
Kern	2027	Crushing/Processing Equipment 100	Aggregate	Diesel	393.6046987	7018.570479	0.056080465
Kern	2027	Crushing/Processing Equipment 175	Aggregate	Diesel	5628.019171	111567.5916	0.050444928
Kern	2027	Crushing/Processing Equipment 300	Aggregate	Diesel	2761.387593	54740.63856	0.050444928
Kern	2027	Crushing/Processing Equipment 50	Aggregate	Diesel	123.5593613	2203.251355	0.056080465
Kern	2027	Crushing/Processing Equipment 600	Aggregate	Diesel	15188.26033	301085.9725	0.050444928
Kern	2027	Crushing/Processing Equipment 75	Aggregate	Diesel	612.1206921	10915.04302	0.056080465
Kern	2027	Crushing/Processing Equipment 750	Aggregate	Diesel	1441.504597	28575.80816	0.050444928
Kern	2027	Excavators 100	Aggregate	Diesel	73453.73015	1297399.552	0.056616121
Kern	2027	Excavators 175	Aggregate	Diesel	412693.1518	8174170.816	0.050487464
Kern	2027	Excavators 300	Aggregate	Diesel	442159.3395	8785687.956	0.05032723
Kern	2027	Excavators 50	Aggregate	Diesel	118621.6158	2103238.103	0.056399518
Kern	2027	Excavators 600	Aggregate	Diesel	508067.1944	10143248.94	0.050089197
Kern	2027	Excavators 75	Aggregate	Diesel	93642.93225	1662899.815	0.056313033
Kern	2027	Excavators 750	Aggregate	Diesel	14338.90257	302425.0403	0.04741308
Kern	2027	Graders 100	Aggregate	Diesel	3403.806284	51361.03204	0.066272155
Kern	2027	Graders 175	Aggregate	Diesel	50689.01205	916528.5923	0.055305435
Kern	2027	Graders 300	Aggregate	Diesel	161320.0008	3160620.653	0.051040608
Kern	2027	Graders 50	Aggregate	Diesel	394.0645189	6456.824149	0.061030703
Kern	2027	Graders 600	Aggregate	Diesel	38712.4977	767602.483	0.050433002
Kern	2027	Graders 75	Aggregate	Diesel	1422.893273	19626.96572	0.072496854
Kern	2027	Graders 750	Aggregate	Diesel	1465.760765	29056.6527	0.050444928
Kern	2027	Hopper Tractor Trailer 300	Aggregate	Diesel	263.5000199	5223.518562	0.050444928
Kern	2027	Hopper Tractor Trailer 600	Aggregate	Diesel	230.8717111	4576.708073	0.050444928
Kern	2027	Asphalt Pavers 100	Aggregate	Gasoline	1292.1	19815.85	0.065205379
Kern	2027	Asphalt Pavers 50	Aggregate	Gasoline	1474.6	19505.6	0.075598802
Kern	2027	Bore/Drill Rigs 100	Aggregate	Gasoline	1543.95	21199.2	0.072830579
Kern	2027	Bore/Drill Rigs 175	Aggregate	Gasoline	536.55	6438.6	0.083333333
Kern	2027	Bore/Drill Rigs 50	Aggregate	Gasoline	94.9	1635.2	0.058035714
Kern	2027	Concrete/Industrial Saws 100	Aggregate	Gasoline	3029.5	42639.3	0.071049478
Kern	2027	Concrete/Industrial Saws 50	Aggregate	Gasoline	3102.5	39091.5	0.079365079
Kern	2027	Concrete/Industrial Saws 50	Aggregate	Diesel	1069.45	25414.95	0.042079563
Kern	2027	Cranes 100	Aggregate	Gasoline	1540.3	32952.2	0.046743465
Kern	2027	Cranes 175	Aggregate	Gasoline	58.4	0	0
Kern	2027	Cranes 50	Aggregate	Gasoline	438	8238.05	0.053167922
Kern	2027	Dumpers/Tenders 100	Aggregate	Gasoline	91.25	3372.6	0.027056277
Kern	2027	Other 175	Aggregate	Gasoline	3186.45	73124.1	0.043576921
Kern	2027	Paving Equipment 100	Aggregate	Gasoline	682.55	13249.5	0.051515152
Kern	2027	Paving Equipment 50	Aggregate	Gasoline	1693.6	28765.65	0.058875777
Kern	2027	Rollers 100	Aggregate	Gasoline	5967.75	99097.5	0.060220994
Kern	2027	Rollers 50	Aggregate	Gasoline	1923.55	25119.3	0.076576577
Kern	2027	Rough Terrain Forklifts 100	Aggregate	Gasoline	13424.7	225241.5	0.059601361
Kern	2027	Rough Terrain Forklifts 175	Aggregate	Gasoline	700.8	10366	0.067605634
Kern	2027	Rough Terrain Forklifts 50	Aggregate	Gasoline	598.6	5489.6	0.109042553
Kern	2027	Rubber Tired Loaders 100	Aggregate	Gasoline	7135.75	136656	0.05221688
Kern	2027	Rubber Tired Loaders 50	Aggregate	Gasoline	719.05	11242	0.063961039
Kern	2027	Signal Boards 50	Aggregate	Diesel	452.6	10533.9	0.042966043
Kern	2027	Skid Steer Loaders 100	Aggregate	Gasoline	12099.75	228052	0.053056978
Kern	2027	Skid Steer Loaders 50	Aggregate	Gasoline	9059.3	151723.2	0.059709392
Kern	2027	Tractors/Loaders/Backhoes 100	Aggregate	Gasoline	5029.7	107616.6	0.046737213
Kern	2027	Trenchers 100	Aggregate	Gasoline	5646.55	90337.5	0.062505051
Kern	2027	Trenchers 50	Aggregate	Gasoline	9150.55	123078	0.074347568
Kern	2027	Nurse Rig Other 175	Aggregate	Diesel	45.93023947	910.5026198	0.050444928
Kern	2027	Off-Highway Tractors 100	Aggregate	Diesel	16818.93293	298869.7628	0.056275124
Kern	2027	Off-Highway Tractors 175	Aggregate	Diesel	90818.94609	1803286.906	0.050363004
Kern	2027	Off-Highway Tractors 300	Aggregate	Diesel	40794.6066	819840.5581	0.049759195
Kern	2027	Off-Highway Tractors 50	Aggregate	Diesel	20396.37772	351394.0123	0.058044181
Kern	2027	Off-Highway Tractors 600	Aggregate	Diesel	107576.3698	2179351.012	0.049361654
Kern	2027	Off-Highway Tractors 75	Aggregate	Diesel	17739.27904	302484.405	0.058645268
Kern	2027	Off-Highway Tractors 750	Aggregate	Diesel	8689.372657	174012.187	0.049935426
Kern	2027	Off-Highway Trucks 100	Aggregate	Diesel	461.1497316	8223.001156	0.056080465
Kern	2027	Off-Highway Trucks 175	Aggregate	Diesel	23628.90503	469928.9062	0.050281872
Kern	2027	Off-Highway Trucks 300	Aggregate	Diesel	55043.09811	1105585.868	0.049786362
Kern	2027	Off-Highway Trucks 50	Aggregate	Diesel	864.4125297	15413.79024	0.056080465
Kern	2027	Off-Highway Trucks 600	Aggregate	Diesel	402555.3763	8063939.699	0.049920435
Kern	2027	Off-Highway Trucks 75	Aggregate	Diesel	1052.967497	16250.59414	0.064795631
Kern	2027	Off-Highway Trucks 750	Aggregate	Diesel	50058.18229	1156501.593	0.043284145
Kern	2027	Other Construction Equipment 100	Aggregate	Diesel	16422.92661	271582.4031	0.060471247
Kern	2027	Other Construction Equipment 175	Aggregate	Diesel	51707.82328	1000871.715	0.051662788
Kern	2027	Other Construction Equipment 300	Aggregate	Diesel	48990.39451	952596.5281	0.051428273
Kern	2027	Other Construction Equipment 50	Aggregate	Diesel	12198.90506	206076.1164	0.059196113
Kern	2027	Other Construction Equipment 600	Aggregate	Diesel	153909.7445	3097139.906	0.049694153
Kern	2027	Other Construction Equipment 75	Aggregate	Diesel	21009.93832	349121.1126	0.060179512
Kern	2027	Other Construction Equipment 750	Aggregate	Diesel	24234.12201	489029.6516	0.049555527
Kern	2027	Other Material Handling Equipment 100	Aggregate	Diesel	5208.779991	89957.1935	0.057902873
Kern	2027	Other Material Handling Equipment 175	Aggregate	Diesel	21401.7731	419684.0932	0.050994959
Kern	2027	Other Material Handling Equipment 300	Aggregate	Diesel	21853.74323	433037.1595	0.050466208
Kern	2027	Other Material Handling Equipment 50	Aggregate	Diesel	2396.608937	38878.2085	0.061644017
Kern	2027	Other Material Handling Equipment 600	Aggregate	Diesel	38655.33685	769459.5382	0.050236997
Kern	2027	Other Material Handling Equipment 75	Aggregate	Diesel	2886.44307	50684.40622	0.056949332
Kern	2027	Other Material Handling Equipment 750	Aggregate	Diesel	4199.907291	83257.27528	0.050444928
Kern	2027	Pavers 100	Aggregate	Diesel	10354.83494	181441.7746	0.05706974
Kern	2027	Pavers 175	Aggregate	Diesel	34386.30499	679813.4154	0.050581975
Kern	2027	Pavers 300	Aggregate	Diesel	41630.03	825896.2451	0.050405884
Kern	2027	Pavers 50	Aggregate	Diesel	1963.12837	32950.54384	0.059578026
Kern	2027	Pavers 600	Aggregate	Diesel	7322.802967	148001.9759	0.049477738
Kern	2027	Pavers 75	Aggregate	Diesel	9562.642644	166458.8757	0.057447478
Kern	2027	Pavers 750	Aggregate	Diesel	300.5070164	5957.130397	0.050444928
Kern	2027	Paving Equipment 100	Aggregate	Diesel	5988.44562	98441.24339	0.06083269
Kern	2027	Paving Equipment 175	Aggregate	Diesel	38147.89714	752286.2617	0.050709283
Kern	2027	Paving Equipment 300	Aggregate	Diesel	17197.69112	340366.8458	0.050526928
Kern	2027	Paving Equipment 50	Aggregate	Diesel	4793.008041	83740.13007	0.057236692
Kern	2027	Paving Equipment 600	Aggregate	Diesel	40469.34348	806977.0451	0.050149312
Kern	2027	Paving Equipment 75	Aggregate	Diesel	3565.666248	62195.43501	0.057330031
Kern	2027	Paving Equipment 750	Aggregate	Diesel	8750.239775	173461.2389	0.050444928
Kern	2027	Rollers 100	Aggregate	Diesel	29902.65772	498899.2018	0.059937273
Kern	2027	Rollers 175	Aggregate	Diesel	165706.6569	3258137.107	0.050859326
Kern	2027	Rollers 300	Aggregate	Diesel	14419.31253	280441.1625	0.051416534
Kern	2027	Rollers 50	Aggregate	Diesel	48569.77397	800449.4864	0.060678125
Kern	2027	Rollers 600	Aggregate	Diesel	11408.17677	234700.3585	0.048607411
Kern	2027	Rollers 75	Aggregate	Diesel	19322.26502	325152.7864	0.059425187
Kern	2027	Rollers 750	Aggregate	Diesel	279.7039152	5544.738075	0.050444928
Kern	2027	Rough Terrain Forklifts 100	Aggregate	Diesel	42139.39996	712440.1586	0.059147985
Kern	2027	Rough Terrain Forklifts 175	Aggregate	Diesel	264166.5753	5216065.317	0.050644798
Kern	2027	Rough Terrain Forklifts 300	Aggregate	Diesel	2266.203382	44194.0295	0.051278496
Kern	2027	Rough Terrain Forklifts 50	Aggregate	Diesel	1469.001705	26194.53486	0.056080465
Kern	2027	Rough Terrain Forklifts 600	Aggregate	Diesel	640.8032194	12695.14423	0.050476246
Kern	2027	Rough Terrain Forklifts 75	Aggregate	Diesel	58556.21013	1030896.405	0.056801256
Kern	2027	Rough Terrain Forklifts 750	Aggregate	Diesel	211.177896	4184.59082	0.050465602
Kern	2027	Rubber Tired Dozers 100	Aggregate	Diesel	2081.20391	34545.67034	0.060245
Kern	2027	Rubber Tired Dozers 175	Aggregate	Diesel	6294.715262	124179.617	0.050690406
Kern	2027	Rubber Tired Dozers 300	Aggregate	Diesel	7807.075176	155425.5901	0.050230307
Kern	2027	Rubber Tired Dozers 50	Aggregate	Diesel	543.478532	4842.436385	0.112232457
Kern	2027	Rubber Tired Dozers 600	Aggregate	Diesel	42374.07593	934998.278	0.045319951
Kern	2027	Rubber Tired Dozers 75	Aggregate	Diesel	1043.777033	15407.64563	0.067744097
Kern	2027	Rubber Tired Dozers 750	Aggregate	Diesel	1287.282821	31016.92539	0.041502915
Kern	2027	Rubber Tired Loaders 100	Aggregate	Diesel	36186.69035	623120.0032	0.058073389
Kern	2027	Rubber Tired Loaders 175	Aggregate	Diesel	271005.8014	5354035.76	0.050617107
Kern	2027	Rubber Tired Loaders 300	Aggregate	Diesel	505413.9728	10055722.7	0.050261328
Kern	2027	Rubber Tired Loaders 50	Aggregate	Diesel	2822.499561	47597.32975	0.059299536
Kern	2027	Rubber Tired Loaders 600	Aggregate	Diesel	388268.6637	7819415.663	0.049654435
Kern	2027	Rubber Tired Loaders 75	Aggregate	Diesel	22021.90083	376300.8096	0.058522066
Kern	2027	Rubber Tired Loaders 750	Aggregate	Diesel	10097.85938	259326.4375	0.038938796
Kern	2027	Scrapers 100	Aggregate	Diesel	1079.742593	17016.90838	0.063451161
Kern	2027	Scrapers 175	Aggregate	Diesel	9274.468842	175031.4006	0.052987457
Kern	2027	Scrapers 300	Aggregate	Diesel	129350.5287	2477266.555	0.052215022
Kern	2027	Scrapers 50	Aggregate	Diesel	104.3925805	1103.327895	0.094616098
Kern	2027	Scrapers 600	Aggregate	Diesel	460137.9853	9632816.826	0.04776775
Kern	2027	Scrapers 75	Aggregate	Diesel	873.0091762	14282.09782	0.061126117
Kern	2027	Scrapers 750	Aggregate	Diesel	71770.06853	1664278.614	0.04312383
Kern	2027	Skid Steer Loaders 100	Aggregate	Diesel	163420.1269	2893986.459	0.056468864
Kern	2027	Skid Steer Loaders 175	Aggregate	Diesel	47306.72316	934567.8611	0.050618821
Kern	2027	Skid Steer Loaders 300	Aggregate	Diesel	3889.866831	77313.58442	0.050312851
Kern	2027	Skid Steer Loaders 50	Aggregate	Diesel	45812.88636	786212.2813	0.058270377
Kern	2027	Skid Steer Loaders 600	Aggregate	Diesel	2691.570954	53356.62155	0.050444928
Kern	2027	Skid Steer Loaders 75	Aggregate	Diesel	319607.4762	5651642.622	0.056551254
Kern	2027	Skid Steer Loaders 750	Aggregate	Diesel	267.9444119	5311.622403	0.050444928
Kern	2027	Spray Truck 100	Aggregate	Diesel	321.5388113	5733.52609	0.056080465
Kern	2027	Spray Truck 175	Aggregate	Diesel	1016.248101	20145.69419	0.050444928
Kern	2027	Spray Truck 300	Aggregate	Diesel	955.5140824	18851.65241	0.050685959
Kern	2027	Spray Truck 50	Aggregate	Diesel	724.6105374	12920.90807	0.056080465
Kern	2027	Spray Truck 600	Aggregate	Diesel	3892.566935	77164.68351	0.050444928
Kern	2027	Spray Truck 75	Aggregate	Diesel	443.1581837	7902.184491	0.056080465
Kern	2027	Spreader Tractor Trailer 50	Aggregate	Diesel	42.01540315	749.1985468	0.056080465
Kern	2027	Spreader Tractor Trailer 600	Aggregate	Diesel	886.9684357	17582.90603	0.050444928
Kern	2027	Spreader Truck 100	Aggregate	Diesel	512.4560945	9137.871648	0.056080465
Kern	2027	Spreader Truck 175	Aggregate	Diesel	613.6337198	12164.4284	0.050444928
Kern	2027	Spreader Truck 300	Aggregate	Diesel	431.0979189	8545.911997	0.050444928
Kern	2027	Spreader Truck 50	Aggregate	Diesel	12.13593421	216.4021665	0.056080465
Kern	2027	Spreader Truck 600	Aggregate	Diesel	4094.97762	81177.19162	0.050444928
Kern	2027	Spreader Truck 75	Aggregate	Diesel	71.83249682	1280.882681	0.056080465
Kern	2027	Surfacing Equipment 100	Aggregate	Diesel	1233.646532	17079.32374	0.072230409
Kern	2027	Surfacing Equipment 175	Aggregate	Diesel	4401.508361	85929.01432	0.05122261
Kern	2027	Surfacing Equipment 300	Aggregate	Diesel	5122.128165	99948.89719	0.051247471
Kern	2027	Surfacing Equipment 50	Aggregate	Diesel	517.9064331	7922.09605	0.065374925
Kern	2027	Surfacing Equipment 600	Aggregate	Diesel	29007.03739	579321.689	0.050070691
Kern	2027	Surfacing Equipment 75	Aggregate	Diesel	889.32486	13756.53403	0.064647451
Kern	2027	Surfacing Equipment 750	Aggregate	Diesel	12273.41528	243963.777	0.050308351
Kern	2027	Tank Truck 100	Aggregate	Diesel	124.7445518	2224.385105	0.056080465
Kern	2027	Tank Truck 175	Aggregate	Diesel	178.1475281	3531.525047	0.050444928
Kern	2027	Tank Truck 300	Aggregate	Diesel	8694.973335	172365.6591	0.050444928
Kern	2027	Tank Truck 600	Aggregate	Diesel	3498.798764	69358.78143	0.050444928
Kern	2027	Tanker Truck Trailer 100	Aggregate	Diesel	185.2042059	3302.4727	0.056080465
Kern	2027	Tanker Truck Trailer 175	Aggregate	Diesel	258.9321302	5132.966551	0.050444928
Kern	2027	Tanker Truck Trailer 300	Aggregate	Diesel	101.9614625	2021.24308	0.050444928
Kern	2027	Tanker Truck Trailer 50	Aggregate	Diesel	53.21699857	948.9400315	0.056080465
Kern	2027	Tanker Truck Trailer 600	Aggregate	Diesel	292.0944952	5790.383856	0.050444928
Kern	2027	Tanker Truck Trailer 75	Aggregate	Diesel	62.28348654	1110.609303	0.056080465
Kern	2027	Telescopic Handler 100	Aggregate	Diesel	2597.683036	46320.63981	0.056080465
Kern	2027	Telescopic Handler 175	Aggregate	Diesel	14422.0996	285897.91	0.050444928
Kern	2027	Telescopic Handler 300	Aggregate	Diesel	412.4975361	8177.18548	0.050444928
Kern	2027	Telescopic Handler 50	Aggregate	Diesel	188.5543532	3362.210923	0.056080465
Kern	2027	Telescopic Handler 600	Aggregate	Diesel	194.7255107	3860.160314	0.050444928
Kern	2027	Telescopic Handler 75	Aggregate	Diesel	5296.690599	94448.05004	0.056080465
Kern	2027	Telescopic Handler 750	Aggregate	Diesel	214.0512796	4243.266595	0.050444928
Kern	2027	Tractors/Loaders/Backhoes 100	Aggregate	Diesel	502032.1996	8785305.33	0.057144536
Kern	2027	Tractors/Loaders/Backhoes 175	Aggregate	Diesel	522961.5351	10295746.69	0.05079394
Kern	2027	Tractors/Loaders/Backhoes 300	Aggregate	Diesel	221231.1579	4384646.234	0.050455874
Kern	2027	Tractors/Loaders/Backhoes 50	Aggregate	Diesel	48188.02502	791168.2462	0.060907431
Kern	2027	Tractors/Loaders/Backhoes 600	Aggregate	Diesel	168095.4182	3370506.643	0.049872448
Kern	2027	Tractors/Loaders/Backhoes 75	Aggregate	Diesel	213917.3111	3686505.819	0.058027119
Kern	2027	Tractors/Loaders/Backhoes 750	Aggregate	Diesel	7719.582069	155421.9253	0.049668553
Kern	2027	Trenchers 100	Aggregate	Diesel	5750.744926	98809.85386	0.058200116
Kern	2027	Trenchers 175	Aggregate	Diesel	9276.699051	180340.0446	0.05144004
Kern	2027	Trenchers 300	Aggregate	Diesel	5423.017401	107916.3119	0.050252064
Kern	2027	Trenchers 50	Aggregate	Diesel	14707.93405	251436.1822	0.058495694
Kern	2027	Trenchers 600	Aggregate	Diesel	8779.217966	177392.7535	0.049490285
Kern	2027	Trenchers 75	Aggregate	Diesel	4856.118694	78925.86507	0.061527595
Kern	2027	Trenchers 750	Aggregate	Diesel	380.4556457	8754.149581	0.043460035
Kern	2027	Vacuum Truck 100	Aggregate	Diesel	544.5824542	9710.733508	0.056080465
Kern	2027	Vacuum Truck 175	Aggregate	Diesel	4974.908756	98620.59306	0.050444928
Kern	2027	Vacuum Truck 300	Aggregate	Diesel	5502.349334	109076.3632	0.050444928
Kern	2027	Vacuum Truck 50	Aggregate	Diesel	240.7866373	4293.591998	0.056080465
Kern	2027	Vacuum Truck 600	Aggregate	Diesel	7435.457831	147397.5297	0.050444928
Kern	2027	Vacuum Truck 75	Aggregate	Diesel	354.8658038	6327.797058	0.056080465
Kern	2027	Water Truck 175	Aggregate	Diesel	1467.384399	28977.95205	0.050637961
Kern	2027	Water Truck 300	Aggregate	Diesel	9427.924491	186358.3025	0.050590311
Kern	2027	Water Truck 50	Aggregate	Diesel	80.97633148	1443.931161	0.056080465
Kern	2027	Water Truck 600	Aggregate	Diesel	42423.478	844432.1892	0.050239058
Kern	2027	Water Truck 75	Aggregate	Diesel	473.9770331	7644.916658	0.06199898
Kern	2027	Water Truck 750	Aggregate	Diesel	699.1137159	13858.94951	0.050444928
Kern	2027	Aerial Lifts 100	Aggregate	Diesel	3821.514241	67612.78818	0.056520584
Kern	2027	Aerial Lifts 175	Aggregate	Diesel	5615.156967	111260.564	0.050468529
Kern	2027	Aerial Lifts 300	Aggregate	Diesel	118.6417638	2351.906874	0.050444928
Kern	2027	Aerial Lifts 50	Aggregate	Diesel	9675.348379	170499.9945	0.056746913
Kern	2027	Aerial Lifts 600	Aggregate	Diesel	70.55910096	1398.735278	0.050444928
Kern	2027	Aerial Lifts 75	Aggregate	Diesel	19237.29084	340002.9624	0.056579774
Kern	2027	Welders 100	Aggregate	Gasoline	19574.95	412632.5	0.047439186
Kern	2027	Welders 175	Aggregate	Gasoline	2445.5	50771.5	0.048166786
Kern	2027	Welders 50	Aggregate	Gasoline	14016	260007.75	0.053906085
Kern	2027	Welders 50	Aggregate	Diesel	45650.55	1767819.1	0.025823089

Construction Electricity (Water)

Navigant Table ES2. IOU Marginal Energy Intensity (kWh/AF) [19]

Region	Extraction and Conveyance	Treatment	Distribution	Wastewater Collection + Treatment	Outdoor (Upstream of Customer)	Indoor (All Components)
North Coast	0	490	153	406	643	1,049
San Francisco	0	490	299	406	789	1,195
Central Coast	0	490	153	406	643	1,049
South Coast	0	490	153	406	643	1,049
Sacramento River	0	490	17	406	507	913
San Joaquin River	0	490	17	406	507	913
Tulare Lake	0	490	17	406	507	913
North Lahontan	0	490	17	406	507	913
South Lahontan	0	490	153	406	643	1,049
Colorado River	0	490	17	406	507	913

Source: https://waterenergyinnovations.com/wp-content/uploads/2020/03/FINAL-W-E-White-Paper-20170417.pdf

Treatment (average): 490 kWh/AF
Distribution (average): 99.6 kWh/AF

Construction Water Use 1198000 gallons
Construction Water Use 3.676542 AF

Total 2,167.69 kWh

Operational Fuel Calculation—Project-Generated Operational Trips (Page 1 of 2)

California Air Resource Board (CARB). 2025. EMFAC2021 Web Database. Accessed March 2025.

Source: EMFAC2021 (v1.0.2) Emissions Inventory
Region Type: County
Region: Kern
Calendar Year: 2027, 2028, 2029
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Units: miles/day for CVMT and EVMT, trips/day for Trips, kWh/day for Energy Consumption, tons/day for Emissions, 1000 gallons/day for Fuel Consumption

VMT = Vehicle Miles Traveled
FE = Fuel Economy

				Given					*Calculations*	
Region	Calendar Year	Vehicle Class	Model Year	Speed	Fuel	Population	VMT	Fuel Consumption	FE	VMT*FE
Kern	2029	LDA	Aggregate	Aggregate	Gasoline	334670.4165	13056290.65	400.4405161	32.60481926	425697997.1
Kern	2029	LDA	Aggregate	Aggregate	Diesel	653.6843876	20510.96119	0.43751726	46.88034754	961560.9889
Kern	2029	LDA	Aggregate	Aggregate	Plug-in Hybrid	12657.68601	550382.5119	8.129198926	67.70439706	37263316.12
									Sum of VMT*FE	**463922874.2**
									Total VMT	**13627184.13**
									Weighted Average Fuel Economy	**34.04392792**
Kern	2029	LDT1	Aggregate	Aggregate	Gasoline	30897.93175	1055088.006	39.15357707	26.94742307	28431902.86
Kern	2029	LDT1	Aggregate	Aggregate	Diesel	1.280941051	22.83570163	0.000904005	25.2605954	576.8434197
Kern	2029	LDT1	Aggregate	Aggregate	Plug-in Hybrid	156.2157886	7653.997401	0.104847913	73.00095132	558749.0916
Kern	2029	LDT2	Aggregate	Aggregate	Gasoline	190270.7528	7524179.53	280.2212407	26.85085367	202030643.5
Kern	2029	LDT2	Aggregate	Aggregate	Diesel	644.9937174	26694.00985	0.716847055	37.23808262	994033.7443
Kern	2029	LDT2	Aggregate	Aggregate	Plug-in Hybrid	2696.734339	124010.0247	1.772214796	69.97460182	8677552.1
Kern	2029	MDV	Aggregate	Aggregate	Gasoline	147561.6011	5275055.275	247.4407916	21.31845457	112456026.2
Kern	2029	MDV	Aggregate	Aggregate	Diesel	2237.608081	77749.40775	2.962351799	26.24583879	2040598.422
Kern	2029	MDV	Aggregate	Aggregate	Plug-in Hybrid	1818.701594	80756.25009	1.188949978	67.92232775	5485152.487
									Sum of VMT*FE	**360675235.3**
									Total VMT	**14171209.34**
									Weighted Average Fuel Economy	**25.4512672**
Kern	2029	LHDT1	Aggregate	Aggregate	Gasoline	15164.708	550755.9092	53.98886013	10.20128797	5618419.629
Kern	2029	LHDT1	Aggregate	Aggregate	Diesel	13319.0207	457025.3956	28.66517986	15.94357328	7286617.884
Kern	2029	LHDT2	Aggregate	Aggregate	Gasoline	2586.215203	85630.72336	9.715323266	8.813986011	754747.9978
Kern	2029	LHDT2	Aggregate	Aggregate	Diesel	6159.930679	210521.6137	15.8652125	13.26938506	2793492.357
Kern	2029	MHDT	Aggregate	Aggregate	Gasoline	1087.178821	68904.54741	13.94429378	4.941415355	340485.9886
Kern	2029	MHDT	Aggregate	Aggregate	Diesel	11161.95572	524406.9417	57.83120933	9.067888219	4755263.529
Kern	2029	MHDT	Aggregate	Aggregate	Natural Gas	100.6214915	4778.890331	0.667605275	7.158257293	34208.52656
Kern	2029	HHDT	Aggregate	Aggregate	Gasoline	1.299506506	155.4162811	0.037027316	4.197341274	652.3351714
Kern	2029	HHDT	Aggregate	Aggregate	Diesel	32361.07231	4987097.652	748.1123703	6.666241397	33245196.82
Kern	2029	HHDT	Aggregate	Aggregate	Natural Gas	481.8874591	30340.76544	5.746592597	5.279783615	160192.6762
									Sum of VMT*FE	**54989277.74**
									Total VMT	**6919617.856**
									Weighted Average Fuel Economy	**7.946866271**
Kern	2029	MCY	Aggregate	Aggregate	Gasoline	19120.45179	106237.0211	2.509149387	42.33985494	4498060.062
									Weighted Average Fuel Economy	**42.33985494**
Kern	2029	MH	Aggregate	Aggregate	Gasoline	2099.599674	18571.93192	4.206985797	4.414545905	81986.64601
Kern	2029	MH	Aggregate	Aggregate	Diesel	1187.111601	9925.305254	1.055069719	9.407250603	93369.83383
	2029	OBUS	Aggregate	Aggregate	Gasoline	309.5761881	15492.75888	3.114434837	4.974500895	77068.74294
Kern	2029	OBUS	Aggregate	Aggregate	Diesel	171.1057199	11541.82607	1.642844598	7.025512991	81087.24897
Kern	2029	OBUS	Aggregate	Aggregate	Natural Gas	4.333854993	202.1689217	0.025261699	8.002981989	1617.954239
Kern	2029	SBUS	Aggregate	Aggregate	Gasoline	173.062545	11546.02074	1.148130772	10.0563638	116110.985
Kern	2029	SBUS	Aggregate	Aggregate	Diesel	1022.070271	22211.80309	2.687168308	8.265877139	183600.0354
Kern	2029	SBUS	Aggregate	Aggregate	Natural Gas	196.0277301	4703.628164	0.80649049	5.832217763	27432.58373
Kern	2029	UBUS	Aggregate	Aggregate	Gasoline	58.3999123	4420.533252	0.752090134	5.877664197	25982.41003
Kern	2029	UBUS	Aggregate	Aggregate	Diesel	38.4010574	4070.16023	0.407948431	9.977143984	40608.57466
Kern	2029	UBUS	Aggregate	Aggregate	Natural Gas	155.0098961	16129.31952	2.322910681	6.943581453	111995.2439
									Sum of VMT*FE	**840860.2587**
									Total VMT	**118815.456**
									Weighted Average Fuel Economy	**7.077027575**

Operational Fuel Calculation—Project-Generated Operational Trips (Page 2 of 2)

Total Operational VMT

Land Use	Annual VMT
Total VMT	**469,400.00**

Fleet Mix from CalEEMod

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH	
43.349755	3.383162	22.963920	17.826734	3.205678	0.986814	1.684909	4.027608	0.054688	0.036393	1.996353	0.172108	0.311879	100.000

Vehicle Type		Fraction of 1	Annual VMT	Daily VMT	Average Fuel Economy (miles/gallon)	Total Daily Fuel Consumption (gallons)	Total Annual Fuel Consumption (gallons)	
Passenger Cars (LDA)		0.4335	203,484	557	34.04	16.4	5,977	43.35%
Light Trucks and Medium Vehicles (LDT1, LDT2, and MDV)		0.4417	207,352	568	25.45	22.3	8,147	44.17%
Light-Heavy to Heavy-Heavy Diesel Trucks		0.0991	46,494	127	7.95	16.0	5,851	9.91%
Motorcycles		0.0200	9,371	26	42.34	0.6	221	2.00%
Other		0.0058	2,699	7	7.08	1.0	381	0.58%
Project Total			*469,400*	*1286.027417*		*56.38*	*20,577.48*	
		1.0000						

Stantec

Stantec is a global leader in sustainable architecture, engineering, and environmental consulting. The diverse perspectives of our partners and interested parties drive us to think beyond what's previously been done on critical issues like climate change, digital transformation, and future-proofing our cities and infrastructure. We innovate at the intersection of community, creativity, and client relationships to advance communities everywhere, so that together we can redefine what's possible.

Stantec Consulting Services Inc.
2646 Santa Maria Way, Suite 107
Santa Maria CA 93455-1776
stantec.com