

Application No. B0921

Updated: 02/18/2026 (See Underlined Text)

Staff Summary

Crimson Renewable Energy LLC
Crimson Renewable Energy Bakersfield Biodiesel Plant, Bakersfield, CA
Biodiesel from Used Cooking Oil, Animal Fat, and Distillers' Corn Oil

Deemed Complete Date: 12/19/2025

Posted for Comment Date: 1/30/2026

Carbon Intensity (CI) Certified Date: 2/18/2026

CI Start Date: 10/1/2025

Pathway Summary

Crimson Renewable Energy (Crimson) seeks provisional certification of six Tier 2 Biodiesel pathways derived from Distillers' Corn Oil (DCO), Animal Fat (tallow), and Used Cooking Oil (UCO) processed at the Bakersfield Biodiesel Plant. The Bakersfield Biodiesel Plant features new technologies and systems for feedstock pre-treatment, transesterification, glycerin processing, and methanol recovery.

In 2021, Crimson completed the construction of an additional processing unit which utilizes a unique patented process called RepCat (Repeatable Catalyst system). Unlike conventional sodium or potassium methylate catalyst-based biodiesel technologies that requires costly byproduct treatment as well as high catalyst and chemical costs, the RepCat process employs a reusable catalyst technology for the esterification of free fatty acids (FFA) in feedstocks with the produced glycerin being salt free.

The catalyst is synthesized on-site and is reused within the process.

UCO is sourced domestically and from Mexico, and the suppliers use either low rendering energy, zero rendering energy, or standard rendering energy.

Carbon Intensity of Fuel Type Pathways

The CIs are determined from life cycle analysis conducted using a modified version of the Board-approved Tier 1 Simplified CI Calculator for Biodiesel and Renewable Diesel.¹ The calculator was modified to explain calculation changes, especially new process units/life cycle stages or inputs. The modified calculator has been

¹ The Tier 1 Simplified CI Calculator for Biodiesel and Renewable Diesel (August 13, 2018), incorporated by reference in the LCFS Regulation, section 95488.3(b).

determined to be equivalent to CA-GREET3.0 pursuant to section 95488.7(a)(1) of the LCFS regulation. Crimson has provided operational data and supporting documentation for unit operations, (e.g., process fuel and chemical use, feedstock purchase and fuel production) and transport of feedstock and/or fuel for a period of six (6) months, from February 2025 to July 2025, for these pathways.

Proposed Pathway CI				
Pathway Number	Fuel & Feedstock	Pathway FPC	Pathway Description	Carbon Intensity (gCO_{2e}/MJ)
B092101	Biodiesel from Distillers' Corn Oil	<u>BIO003B09210100</u>	North American Sourced Distillers' Corn Oil transported by truck and rail to Biodiesel plant in Bakersfield, CA; Natural Gas and Grid Electricity; In-state fuel distribution by truck and rail.	27.80
B092102	Biodiesel from Animal Fat	<u>BIO002B09210200</u>	North American Sourced Animal Fat transported by truck and rail to Biodiesel plant in Bakersfield, CA; Natural Gas and Grid Electricity; In-state fuel distribution by truck and rail.	33.21
B092103	Biodiesel from Used Cooking Oil	<u>BIO001B09210300</u>	North American Sourced Zero Energy Rendered Used Cooking Oil transported by truck to Biodiesel plant in Bakersfield, California; Natural Gas and Grid Electricity; In-state fuel distribution by truck and rail.	15.11

Proposed Pathway CI

B092104	Biodiesel from Used Cooking Oil	<u>BIO001B09210400</u>	North American Sourced Low Energy Rendered Used Cooking Oil transported by truck to Biodiesel plant in Bakersfield, California; Natural Gas and Grid Electricity; In-state fuel distribution by truck and rail.	15.31
B092105	Biodiesel from Used Cooking Oil	<u>BIO001B09210500</u>	North American sourced Used Cooking Oil Standard Rendering Energy, transported by truck and rail to Biodiesel plant in Bakersfield, California; Natural Gas and Grid Electricity; In-state fuel distribution by truck and rail.	20.31
B092106	Biodiesel from Used Cooking Oil	<u>BIO001B09210600</u>	Mexico sourced Used Cooking Oil transported by truck and rail to Biodiesel plant in Bakersfield, California; Natural Gas and Grid Electricity; In-state fuel distribution by truck and rail.	24.70

Operating Conditions

The certified CI value in the above table may be used to report and generate credits for fuel quantities that are produced at the facility in the manner described in the applicant's Life Cycle Analysis (LCA) report, and dispensed for transportation use in California, subject to the following requirements and conditions:

1. Fuel pathway holders are subject to the requirements of the California Air Resources Board's (CARB) Low Carbon Fuel Standard (LCFS) regulation, which appears at sections 95480 to 95503 of title 17, California Code of Regulations. Requirements include ongoing monitoring, reporting, recordkeeping, and third-party verification of operational CI and a controlled process for providing product transfer documents or other similar records to counterparties or CARB. All specified source feedstocks reported in the fuel production process must meet chain-of-custody requirements specified in section 95488.8(g)(1)(B).
2. The Crimson Renewable Energy Bakersfield Biodiesel Plant (80174) is identified as Plant 1 and the Crimson REP CAT REPCAT (F00366) is identified as Plant 2. The LCA system boundary includes Plant 1 and Plant 2 where all inputs and outputs are combined to calculate a composite CI for each feedstock used.
3. Feedstock moisture content is subject to monitoring, reporting, and verification. Either the representative method or the conservative method may be used. The representative method calculates monthly weighted average moisture content values from financial transaction records or internal measurements by the fuel producer. The conservative method assumes feedstock moisture content is zero, based on the lower value of the range for allowable moisture content.
4. The following Operating Conditions (OCs) are applicable to the Emissions Factors (EF) for tallow and UCO rendering (Field 2.5) in the "Tallow" and "UCO" feedstock tabs in the Simplified CI Calculator for Biodiesel when the tallow and the UCO have been rendered and sourced from an international rendering facility outside the United States and Canada, and transported to the renewable diesel production facility.
 - a. For tallow and UCO feedstocks not sourced from the United State or Canada, site-specific energy consumption data for all rendering facilities, which is subject to verification, must be used to derive the EFs.
 - b. If site-specific data is not available, the applicant shall provide, for purposes of verification, rendering energy use including energy-mix (e.g., diesel, electricity, natural gas, biomass etc.) from at least two rendering facilities for each region from where tallow and UCO are sourced.

- c. If site-specific data cannot be provided, nor the rendering EF profile from two facilities per region established, the rendering EF shall be based upon the most conservative thermal energy requirement parameters determined by CARB. The emissions factor for electricity (gCO₂e per kWh of electricity) consumption shall be region specific and obtained from the International Energy Agency (IEA) website for the most current data availability.

5. **Site Specific Zero-Energy UCO Rendering**

- a. Applicants for biodiesel or renewable diesel pathways who select "User Defined" Rendering (field 2.4), and claim "zero" Used Cooking Oil Extraction Energy (Btu/lb oil) (field 2.6), and correspondingly claim "zero" GHG Emissions Factor (gCO₂e/lb oil) (field 2.5) shall provide evidence to the verifier (and to CARB upon request) to confirm that the feedstock has not been processed prior to receipt by the fuel production facility.
- b. The claim of "zero" Energy for Oil Extraction is only applicable to unprocessed UCO feedstocks. This is applicable to UCO that is collected from points of origin and delivered directly to fuel production facilities. In this scenario, any energy that may be used for processing would be accounted for in the energy consumption of the fuel production facility.
- c. UCO may be collected from points of origin and transported to a central collection facility or aggregator prior to delivery to a fuel production facility. If the collection facility only stores UCO, and does not process it, the feedstock may be reported as "unprocessed UCO" provided that the applicant can demonstrate to the verifier (and to CARB upon request) that no processing occurred, and that the UCO was only transported and stored prior to delivery to the fuel production facility. In this scenario, the collection facility shall be registered as an intermediate facility in the Alternative Fuels Portal (AFP), and is subject to a verifier site visit, as it is supplying site-specific data for CI determination (LCFS Regulation section 95488.2(a)).
- d. If the number of feedstock supply facilities included in the weighted average energy calculation is five or less, each facility shall be registered as an intermediate facility in the AFP. For a larger number of intermediate facilities, the fuel pathway applicant/holder may consult CARB regarding registration of a subset of intermediate facilities in the AFP and include the information required in LCFS Regulation section 95488.2(a) in a supplemental tab in the Simplified CI Calculator.
- e. Energy use for pumping from the truck to storage, storage to truck, is considered negligible in most circumstances as such transport operations

would likely have occurred regardless of whether the feedstock were used for fuel production.

- f. Any use of electrical or thermal energy to heat, filter, decant, or otherwise process the UCO feedstock must be accounted for in determination of a User-Defined Rendering Energy input. An intermediate facility's (collector, aggregator, or processing facility) site-specific energy use can be determined by summing all energy consumption and dividing by UCO throughput, on a monthly basis.
- g. The claim of zero Energy for Oil Extraction is subject to CARB compliance review and annual verification by an accredited LCFS Verification Body.

6. **Site Specific Low-Energy UCO Rendering**

Weighted average low energy processing and transportation of UCO

- a. This OC is for weighted average low energy processing and transportation of UCO entered in the Tier 1 Simplified CI Calculator for Biodiesel or Renewable Diesel; specifically, data field 2.5 "User-defined UCO Rendering GHG emission factor, gCO₂e/lb oil", field 2.6 "User Defined Oil Extraction Energy, Btu/lb oil", and fields 3.7 to 3.10 for transportation distance/mode/mileage/quantity of oil transported in the UCO tabs. For purposes of this operating condition, "feedstock supply facility" means a facility that receives raw UCO from points of origin and processes it prior to delivery to the fuel production facility.
- b. If the number of feedstock supply facilities included in the weighted average energy calculation is five or less, each facility shall be registered as an intermediate facility in the Alternative Fuels Portal. For a larger number of intermediate facilities, the fuel pathway applicant/holder may consult CARB regarding registration of a subset of intermediate facilities in the AFP and include the information required in LCFS Regulation section 95488.2(a) in a supplemental tab in the Simplified CI Calculator.
- c. If the weighted average UCO processing energy and transportation distance does not result in a CI value that meets the substantiality provision in section 95488.9(a)(1)(A) of the LCFS Regulation, the standard energy value must be used.
- d. System boundary for each feedstock supply facility: The low processing energy for each feedstock supply facility is calculated by dividing total facility energy use from electricity and natural gas utility invoices, by total UCO processed and sold (Btu/lb), not just the quantity sold and shipped to the fuel production facility. If total facility energy use is not attributed to UCO, the fuel pathway applicant must request CARB approval of an

alternate method to account for energy attribution. Generally, no less than 24 months of operations data are required to calculate the feedstock processing energy. The data period for subsequent Annual Fuel Pathway Reports will run from the first month provided in this application to 24 consecutive months. If energy sources other than natural gas and electricity are used, the fuel pathway applicant must request CARB approval of an alternate method.

Fuel Pathway Application--Weighting Factors and UCO Supplier Validation

- a. Weighting factors used to calculate the weighted average are based on the relative proportion of feedstock supplied by each facility to the fuel production facility during the application data period or the most recent 12 consecutive months, whichever data period is shorter. The applicant may apply a margin of safety to the fuel pathway CI to allow for future variations, including weighting factors.
- b. Data from each of the listed feedstock supply facilities must be validated, including a verifier site visit to each listed feedstock supply facility, prior to reporting biodiesel quantities in Quarterly Fuel Transaction Reports from the UCO low processing energy fuel pathway. Additional UCO suppliers cannot be included in this fuel pathway without validation and certification of an updated fuel pathway application.

Annual Fuel Pathway Report--Weighting Factors and UCO Supplier Verification

- a. The weighted average operational CI, calculated annually in the Annual Fuel Pathway Report (AFPR) and used by CARB for compliance comparison with the certified CI, will be based on the proportion of feedstock purchased during the data year from the validated UCO supply facilities. The data year is the calendar year prior to the reporting and verification deadlines. Data from each feedstock supply facility will be verified and each may require a verifier site visit.

7. Co-Products Testing

Staff provides the following Operating Condition for user-defined input values for co-products in Field 2.19.a: "Energy Density of Distillate Bottoms Production" (LHV, Btu/lb), "Energy Density for Free Fatty Acid Production" (LHV, Btu/lb), and "Energy Density of Distilled Glycerin" (LHV, Btu/lb) of the 'BD-Production' tab in the Tier 1 Simplified CI Calculator for Biodiesel.

These input values shall be determined by independent laboratory analysis, and shall be reported as a Representative Value, or a Conservative Value with the following constraints, respectively:

- a. The Representative Value of Energy Density shall be based upon CARB's approved sampling and analysis plan used to determine the user-defined input value for the Energy Density of Co-Products distillate bottoms, free fatty acids (FFAs), and distilled glycerin co-produced and exported for sale under this fuel pathway. The applicant's proposed sampling and analysis plan shall take into account the variability of the facility-specific material attribute in selecting the sample size, sampling method, frequency of analysis or measurements, and the calculation method used to determine the composite, representative, user-defined input value.
- b. Results derived on a higher heating value (HHV) basis shall be converted to a lower heating value (LHV) basis using a factor approved by CARB. Inputs must be site-specific: results from one facility's co-product analysis may not be reported in applications or AFPRs for any other facility's pathways.
- c. The Conservative Value for Energy Density is the lowest result of independent laboratory analyses reduced by a conservative margin of 5 percent. Lower values for co-product energy density reduce co-product credit and correspond to higher, more conservative, CI values. The value may be determined from analysis of an initial subset of facility-specific results provided to CARB at the time of application. The applicant must demonstrate that the selected value is conservative, relative to independent laboratory analysis of the facility's specific material and peer reviewed literature values for the material.
- d. The fuel pathway will be certified with operating conditions requiring a minimum sampling and analysis frequency, to be determined during the certification process on the basis of the initial subset of results provided with the application package. If any analysis results in a lower value than the approved conservative value, the user-defined input value must be updated in the subsequent AFPR. A fuel pathway holder may transition from a conservative value to a representative value for the subsequent AFPR if approved by CARB prior to the report due date.

8. **Sampling and Analysis Plan**

The applicant shall develop a sampling and analysis plan for each fuel production facility, to demonstrate to CARB the validity of composite values used for all relevant user-defined inputs. At a minimum, the proposed sampling and analysis plan shall include the following:

- a. Description of the material attribute(s) specified for all relevant user defined inputs (e.g., Energy Density (Btu/lb) of distillate bottoms).
- b. The composition or purity of the co-product or product sample (e.g., moisture content, FFA content, carbon, or other relevant constituents).

- c. The proposed sampling frequency, given as a number of samples per time period and per unit of fuel produced (e.g., every 100,000 gallons), to monitor the material attribute and its variability. The applicant must indicate the method of compositing collected samples with due consideration to changes in production cycles (batch runs, or continuous), changes in type of feedstock, seasonal availability of feedstocks, and disruptions to the production process (startup and shutdown).
- d. The fuel pathway applicant/holder shall maintain Chain of Custody evidence of collected, composited, and delivered samples by the applicant with the associated laboratory analysis reports. Samples submitted shall be clearly identified by date, type, location, and fuel production batch. Documentation of analytical results must identify the samples and the independent laboratory performing the analysis.
- e. The test methods employed (standard or industry recognized) shall be described for all analytical measurements (e.g., higher heating value, moisture) to support the use of a composite value for a user defined input.
- f. Individual GC test results shall be averaged per the stated frequency (i.e., time period) in the Sampling and Analysis plan. Averages and variance shall be provided for each time period reviewed, and individual GC test reports shall be provided as requested by the verification body or CARB.

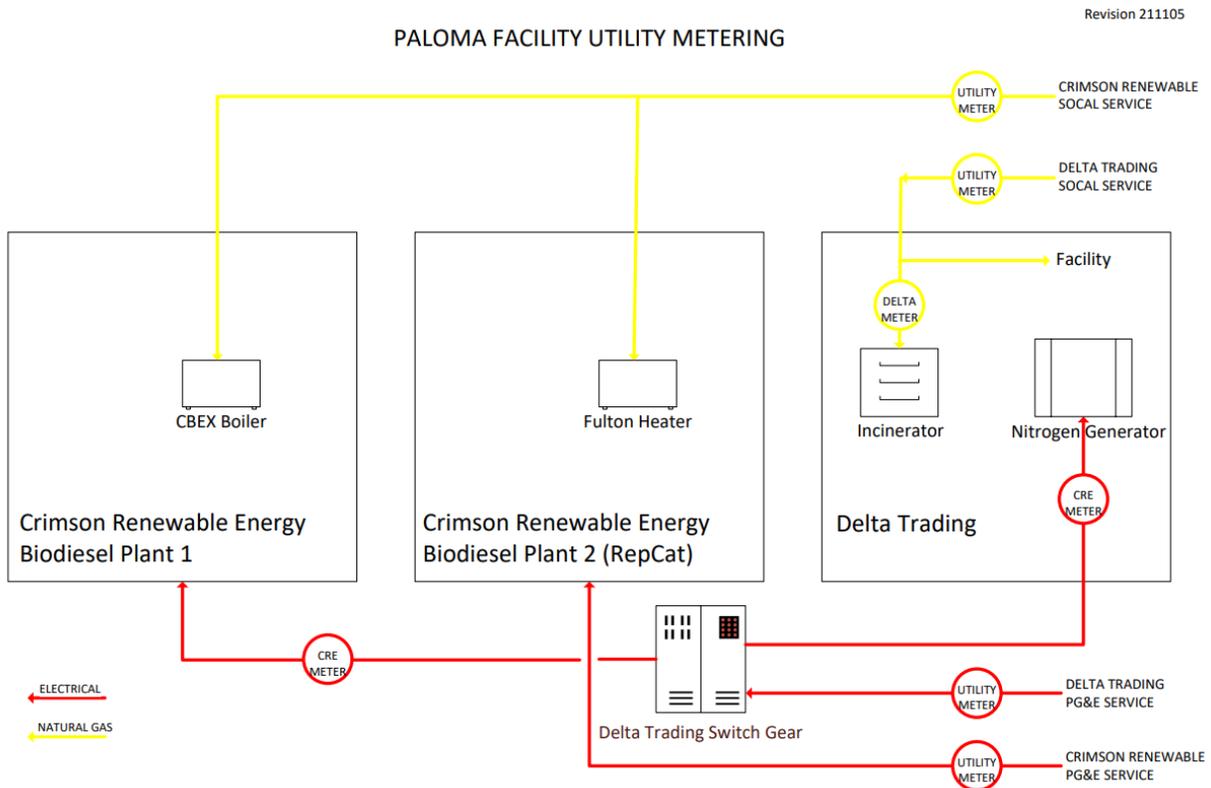
9. **Process Energy Use**

Crimson's expanded biodiesel production facility (Plant 1 and Plant 2) is co-located with Delta Trading, L.P., a transloading and trans-shipping company that provides terminal services for clients including Crimson Renewable Energy. The biodiesel production facility shares some common ownership and some common energy monitoring with Delta Trading.

All-natural gas used for Crimson's expanded biodiesel production facility (Plant 1 and Plant 2) is billed directly to Crimson Renewables by the utility company. Electricity use for the expanded biodiesel production facility is the sum of the electricity used by Plant 2 directly billed to Crimson Renewables by the utility company plus electricity use by Plant 1 billed by Delta Trading.

Electricity billed directly to Delta Trading by the utility includes Plant 1 operations and Delta Trading operations. Delta Trading and Crimson have a "Shared Utilities Access Agreement" that describes how electricity use by Delta Trading and Plant 1 is monitored and compensated. As Delta Trading shares some common ownership with Crimson Renewables, electricity consumption by Plant 1 must be checked against sub metered electricity use for Delta Trading's operations and billing by the utility. See metering diagram below.

The electric submeter was installed and calibrated September 2, 2021, and will adhere to the six-year calibration frequency requirement, pursuant to section 95488.8(j)(1) of the LCFS Regulation.



10. Unlike in the Tier 1 calculator, where a standard value for CI (0.65gCO₂e/MJ) is assigned to chemical use for all BD pathways, in this Tier 2 pathway, all chemical usage must be monitored, reported, and verified, including the new chemical Magnesium Oxide (MgO) for Plant 2 and traditional chemicals for Plant 1 and Plant 2 (Sodium Methoxide, Acids, etc.). A standalone Excel spreadsheet, named "Chemicals", is included in the supporting document to report the use of all chemicals. The CI for all the chemicals used are listed and calculated using the EFs shown in the bottom of the "Chemicals" spreadsheet. This CI will replace the standard CI 0.65 gCO₂e/MJ in cell L167 of the Tier 1 BDRD Calculator.

11. Crimson Renewable Energy utilizes animal fat and UCO residuals with high FFA content from rendering operations at the Baker Commodities, Kerman, CA and Sacramento Rendering Company, Sacramento, CA rendering facilities, such as animal parts left on the floor and fat/grease recovered from UCO and animal fat rendering wastewater streams, as feedstock for biodiesel production. These residuals must be characterized as Tallow and appropriately quantified and represented in the Tier 1 calculator.

12. The inventory of feedstock, fuel, or chemicals can be calculated based on the documented, metered sales, or usage data. If the physical measured inventory is not the same as the calculated inventory, the plant must perform the reconciliation to account for the differences. At the minimum, annual reconciliation is required.
13. Alternate Method Request: Crimson Renewable Energy requested an alternate method (Crimson Renewable Energy - Alternate Method Request 060325.pdf) for reporting Biodiesel fuel production volumes in the Tier 1 Simplified CI Calculator for Biodiesel and Renewable Diesel (BDRD calculator), specifically in sheet "BD-Production", cells C24 to C47.

In the BDRD calculator, monthly biodiesel production is, by default, calculated using biodiesel inventories and sales records. As an alternative method, Crimson's monthly biodiesel production is metered and temperature corrected. Each plant (Bakersfield Biodiesel Plant (80174) (Plant 1) and the CRIMSON REP CAT (F00366) (Plant 2)) has a dedicated meter. Plant 1 uses Micromotion CMF300 (serial # 14102000) - internal ID: FIT 720-E) and Plant 2 uses Endress and Hauser Proline Promass 300 8E3D80EU21-0 (serial # S1000D16000 - internal ID: FIT200200). The meters listed must meet the calibration requirements outlined in §95491.2(a)(1).

CARB has approved the use of metered production data instead of the inventory-calculated methodology. However, biodiesel sales records and all other required inventory records, which must be maintained for any pathway validations, the AFPR, and Quarterly Fuel Transactions Reports (QFTRs), are subject to verification.

14. For all specified source feedstocks reported in the fuel production process the applicant must undergo chain-of-custody verification and ensure that applicable requirements in 95488.8(g)(1) are met. In particular, the applicant must request that the verification body perform chain-of-custody verification with adequate sampling for each region supplying specified source feedstock to the fuel production facility. This entails, among other things, the VB reviewing the supply chain entities' inventory records and confirming by mass balance and/or segregation that sufficient feedstock from the relevant countries associated with the fuel pathway is available to supply to the facility listed in this application.

Staff Analysis and Recommendation

Staff has reviewed the application and has replicated, using the Tier 2 modified version of the Simplified CI Calculator, the CI values calculated by the applicant.

Christianson, PLLP (H3-20-006) submitted a positive validation statement. Staff recommend this application be certified on a provisional basis after all the comments received during the 14-day comment period are addressed satisfactorily by the applicant. The certification is subject to the operating conditions set forth in this document.

Comments and Certification

CARB has reviewed the applicant's response to comments received during the comment period, determined that these adequately address factual and methodological errors, and certified the pathway.