



Application No. B0323

Updated: 09/20/2022 (See Underlined Text)

## Staff Summary

**Phillips 66 Company**  
**Phillips 66 Rodeo, Rodeo, California**  
**Renewable diesel from distiller's corn oil**

Deemed Complete Date: 3/31/2022

Posted for Comment Date: 7/15/2022

CI Certified Date: 9/20/2022CI Start Date: 4/1/2022

### Pathway Summary

Phillips 66 Company ("Phillips 66") has applied for a Tier 2 fuel pathway for Renewable Diesel derived from distiller's corn oil which is processed along with soybean oil and canola oil at their facility in Rodeo, California. The Rodeo facility produces renewable diesel as a primary product and renewable naphtha and renewable propane/light hydrocarbons (off gases) as co-products.

Phillips 66 began production of renewable diesel fuel from various vegetable oils at its Rodeo Refinery in April 2021. The Rodeo facility has an adjacent rail receiving facility owned by NuStar, which is the normal means of receiving distiller's corn oil for ongoing operations.

### Carbon Intensity of Fuel Type Pathways

The CI is determined from life cycle analysis conducted using a modified version of the Board-approved Tier 1 Simplified CI Calculator for Biodiesel and Renewable Diesel.<sup>1</sup>

There are two corrections that are made to the simplified calculator that have previously been approved by CARB. The first is on the Fuel Specs sheet row 24, cells B24 and C24. The values in the simplified calculator are the values at 32F and the calculator requires the hydrogen to be entered as the volume at 60F. The original

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

values of 290 BTU/ft<sup>3</sup> in B24 and C24 are changed to 274.37 BTU/ft<sup>3</sup> using the ideal gas law.

The second change is that the hydrogen emission factor in the simplified calculator includes 150 miles of pipeline transmission. Removing that transmission distance lowers the hydrogen emission factor on the EF Table sheet, cell C37 to 105,612 g CO<sub>2</sub>eq/MM BTU.

The production process uses hydrogen for hydrotreating as well as electricity, natural gas, steam and off gases as process energy. The applicant has provided ten months of renewable diesel production data from May 2021 through February 2022, three months of feedstock inventory for distiller’s corn oil and supporting calculations/data.

The moisture content of distiller’s corn oil was assumed to be zero to be conservative.

Philips 66 measures heat content using a GC analyzer at the Rodeo facility. Likewise, composition and heat content of light hydrocarbons are analyzed using Gas Chromatography.

The following table lists the proposed CI for this application.

**Proposed Pathway CI**

<b>Pathway Number</b>	<b>Fuel &amp; Feedstock</b>	<b>Pathway FPC</b>	<b>Pathway Description</b>	<b>Carbon Intensity (gCO<sub>2</sub>e/MJ)</b>
B032301	Renewable diesel from distiller’s corn oil	<u>RND003B03230100</u>	Renewable diesel produced from distiller’s corn oil transported by rail to California; natural gas, steam, off gases, grid electricity and hydrogen; distributed in California via barge/ship/pipeline	25.46

## 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.
  2. The applicant shall provide evidence that renewable light hydrocarbon displaces natural gas to be eligible for displacement credits as part of the annual verification. The displacement credits are limited to the renewable light hydrocarbon used outside of the fuel pathway system boundary.
  3. This Operating Condition is applicable to the moisture content of feedstock distiller's corn oil (Field 3.6 Moisture Content in the CornSorghum Oil tab) of the Tier 1 Simplified CI Calculator for Biodiesel/Renewable Diesel. The moisture content of distiller's corn oil is reported to be zero. Lower moisture content values of the feedstocks correspond to a higher, and more conservative fuel carbon intensity (CI).
3. Co-Products Testing

This Operating Condition is applicable to user-defined input values for co-products in Field 2.16 "Light Hydrocarbon Production", 2.16.a "Conversion Factor from HHV to LHV for cell J51", and 2.17.a "Energy Density of Renewable Naphtha Production" of the 'RD-Production' tab in the Tier 1 Simplified CI Calculator for BDRD.

These input values shall be determined by Gas Chromatography (GC) analyses or other CARB approved method (e.g., correlation between LHV and specific gravity of renewable naphtha), and shall be reported as a Representative Value, or a Conservative Value with the following constraints, respectively:

- a. The Representative Values of heating value (HHV and LHV)/Energy Density shall be based upon CARB's approved sampling and analysis plan used to determine the user-defined input value for the heating value/Energy Density of Co-Products renewable naphtha, light hydrocarbon and renewable propane 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 sampling method, frequency of analysis or measurements, and the calculation method used to determine the composite, representative, user-defined input value. 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 Annual Fuel Pathway Reports for any other facility's pathways.

- b. The Conservative Value for Energy Density is the lowest result of GC analyses or other CARB approved method 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 analyses of the facility's specific material and peer reviewed literature values for the material. The fuel pathway will be certified with an operating condition 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 Annual Fuel Pathway Report. A fuel pathway holder may transition from a conservative value to a representative value for the subsequent Annual Fuel Pathway Report if approved by CARB prior to the report due date.

#### 4. 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 composited 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 LHV (Btu/lb) of the co-product streams.
- b. The properties (e.g., composition, vapor pressure, density etc.) of the co-product streams.
- 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. Documentation of analytical results must identify the samples by date, type, location, and fuel production batch.

- e. The test methods employed (standard or industry recognized) shall be described for all analytical measurements to support the use of a composited 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. These operating conditions must be presented to the Verification Body.

### **Staff Analysis and Recommendation**

Staff has reviewed the provisional application and has replicated, using the Tier 2 modified version of the Simplified CI Calculator, the CI value calculated by the applicant. SCS Engineers (H3-20-016) submitted a positive validation statement. Staff recommends this application be certified after all the comments received during the 10-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**

These pathways did not receive public comments during the 10-day comment period. CARB certified the pathways.