

Method 2B Application for the Establishment of a New Fuel Pathway under the California Low Carbon Fuel Standard

I. Application Submission Date: February 21, 2013

II. Company Contact Information

a. Company Name: Endicott Biofuels II, LLC and Affiliates¹

b. Mailing Address:

Address Line 1	2 Northpoint Drive
Address Line 2	Suite 950
City	Houston
State/Province	Texas
Zip/Postal Code	77060

c. Main Company Phone Number: 281-598-2180

d. Secondary Company Phone Number: 713-909-2232

e. Fax number: 281-598-2181

f. Company Web Sites: www.endicottbiofuels.com and www.sabinebiofuels.com

g. Primary Method 2B Contact Person:

Name: Christopher Frantz
Position/Title: Principal
Email Address: chris@endicottbiofuels.com
Office Phone Number: 281-598-2180
Mobile Phone Number: 713-725-1968
Fax Number: 281-598-2181

h. Consultant/Third Party Application Preparation Assistance:

Name: Art Samberg
Position/Title: Consultant
Affiliation/Firm: Golder Associates
Office Phone Number: 1-919-462-6491
Mobile Phone Number:

¹ Affiliates include Endicott's wholly- or partially-owned subsidiary biorefineries, including the direct subject of this pathway analysis, Sabine Biofuels II, LLC.

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|----|---|---------|
| i. | LCFS Reporting Tool Organization ID code: | unknown |
| j. | U.S. EPA Company ID (if known): | 6011 |
| k. | U.S. EPA Facility ID (if known): | 81348 |

III. Pathway Information

- a. Pathway application type. Applicants are encouraged to discuss their pathway application types with ARB staff before proceeding. Please check one box only.

Method 2A: Sub-pathway Method 2B: New Pathway

- b. Brief description of proposed pathway. Please emphasize the important innovations and/or distinctive characteristics associated with the proposed pathway or sub-pathway

Endicott's unique production process has been constructed at its first facility, Sabine Biofuels. This process can consume any waste fat or oil, and consumes the fatty acid portion of the molecule to reactively esterify it.

Depending on the feedstock consumed, one or more pretreatment steps may be employed to render the natural lipid suitable for conversion to biodiesel. The first pretreatment step removes water-soluble contaminants [REDACTED]. The next pretreatment step vacuum distills the feedstock, removing contaminants such as mono- and di-glycerides as well as other contaminants into a co-product stream called "distillate bottoms" or "pitch." The final step is reactive esterification with an alcohol using the Davy process to produce high-purity biodiesel.

These represent the entire Endicott patented process. It bears no similarity to the traditional, base-catalyzed, batch biodiesel process called transesterification (TE). The TE process requires very pure refined, bleached and deodorized edible oils with FFA content below 0.5% typically in order to function properly.

Biodiesel produced using the TE process yields a finished product that meets ASTM specifications and has a methyl ester purity of typically ~96 – 97.5%. Finished biodiesel produced by the Endicott process has a purity of >99% methyl ester content. Called G2 Clear®, this biodiesel exceeds both ASTM and the European EN standards in many cases by over an order of magnitude (certificates of analysis available upon request).

Endicott's chemical-purity biodiesel is the same, regardless of what feedstock is used in its production.

- c. For Method 2A Applications only:
- Reference pathway (Existing fuel pathway to which the proposed new sub-pathway is most closely related). The carbon intensity of the reference pathway must be higher by at least 5 gCO₂e/MJ than the carbon intensity of the proposed pathway described in this application. Show all pathway information exactly as it appears in the LCFS Lookup Table:

Fuel:

Pathway Description:

Carbon Intensity Values (gCO₂e/MJ):

Direct and Indirect Emissions:	<i>n/a</i>
<u>Land Use or Other Indirect Effect:</u>	<i>n/a</i>
Total:	<i>n/a</i>

2. Compositional differences (if any) between the fuel produced by the new sub-pathway and the reference pathway identified in item c, 1, above).

N/A

- d. Final carbon Intensity of the proposed pathway or sub-pathway:
The final carbon intensity (WTW) for biodiesel produced by this facility, using Midwest UCO in the Endicott Process is 10.05 gCO₂e/MJ.
- e. Annual volume of fuel that would be produced using the proposed new pathway (millions of gallons per year [MGY]):
Endicott's first facility, Sabine Biofuels II, LLC ("Sabine"), will produce a nameplate volume of 30 million gallons per year of biodiesel.
- f. Annual volume of fuel produced using the proposed new pathway that would enter the California market:
Sabine will market its biodiesel based on maximizing the company's economic performance. The entire facility output of 30MM GPY could conceivably be sold into the California market, but a lesser volume is also possible depending on market conditions at the time of sale.

1. This production volume is expected to be achieved within how many years from the start of production?

Endicott's facility is expected to reach full production rates within 120 days of startup.

2. Does the applicant expect this volume to be achieved by a single or by multiple facilities?

A single facility Multiple facilities

3. If the applicant expects this volume to be achieved by multiple facilities, would all facilities be owned by a single firm? *N/A*

Single firm Multiple firms

- g. Lower Heating Value of the fuel (biodiesel only) to be produced from the new pathway (megajoules per gallon): 126.13 megajoules per gallon. Calculated as follows: $(0.016149 \text{ Btu/lb} \times 7.34 \text{ lb/gal} = 0.11853) \times 1055 \text{ MJ/MMBtu} = 125.05 \text{ MJ/gal}$.

- h. The range of production volumes over which the proposed pathway carbon intensity value is valid. The values reported below must be supported in the documentation accompanying this application.

	Fuel Volume	Units
Lower bound of production volume range	15,000,000	Gallons
Upper bound of production volume range	30,000,000	Gallons

- i. Please provide any information that may be helpful in determining the land use change impacts (if any) of the proposed pathway. Although it is ARB's responsibility to perform all land use change impact analyses, the applicant may provide any information that may be useful to the ARB in completing that analysis.

Because Endicott is proposing this pathway application using used cooking oil (UCO), the values already assumed by CARB in its existing biodiesel pathway have been used. No additional impact analyses are required.

IV. Application Submittal Checklist. Listed below are the documents and files that may be submitted in support of a method 2A/2B application. Check the box to the left of each document or file type included in your submittal. After each submittal category is a check box labeled "includes trade secrets." Check that box if the submittal category contains any information the applicant considers being a trade secret. In the actual submittal, the specific information falling into

the trade secret category must be clearly marked. Additional information regarding the submission of trade secrets can be found in the Instructions above.

- Pathway life cycle analysis report (required).
Word document attached as "The Endicott Process Life Cycle Analysis revised 02-21-2013.docx".
 - Includes trade secrets*
- CA-GREET model results (please submit the full CA-GREET spreadsheet) (required).
Document attached as "Endicott CA-GREET Model Updated 02-02-2013.xls".
 - Includes trade secrets*
- All operating permits issued by the local air pollution control authority (required).
Document attached as "Air Permit Supplement.pdf".
- One or more process flow diagrams covering the complete production process, including all inputs (feedstocks, process energy, etc.) and outputs (finished fuel, co-products, wastes, etc.) (required).
Documents attached as (i) "Air Permit Supplement.pdf" and (ii) in the appendices of "RFS2 Independent Eng Report Final.pdf" beginning at page 71.
 - Includes trade secrets*
- A comprehensive list of all stationary combustion-powered equipment associated with the production facility. List entries should name the equipment, briefly describe its function, identify the fuel or fuels used, and quantify fuel use on a per-gallon-of-finished-fuel-produced basis (required) *N/A*
 - Includes trade secrets*
- Equipment technical specifications
Not included.
 - Includes trade secrets*
- Production process schematics, technical drawings flow diagrams, maps, or other graphical representations (other than/in addition to the required process flow diagram)
Not included.
 - Includes trade secrets*
- Engineering reports
Document attached as "RFS2 Independent Eng Report Final.pdf"
 - Includes trade secrets*

- Technical papers or journal articles
 - Includes trade secrets*
- Emissions monitoring data or emissions modeling results
Not included.
 - Includes trade secrets*
- Spreadsheets, data files, and similar files documenting the calculations behind the fuel life cycle analysis
 - Includes trade secrets*
- Other: In the space below, describe any additional submittals. Rationales for documents submitted or omitted may also be provided.

Document attached as "April 6 2011 Final EBF Pathway Approval.pdf".
 - Includes trade secrets*

The document "April 6 2011 Final EBF Pathway Approval.pdf" has been attached to this application to provide ARB with additional insight from detailed analysis done by the US EPA on Endicott's proprietary process, and their conclusions.

V. Endicott materials sent via electronic mail to the following ARB personnel:

Name	Phone Number	E-mail Address
Ron Oineza	916-324-8018	roineza@arb.ca.gov
Wes Ingram	916-327-2965	wingram@arb.ca.gov
Chan Pham	916-323-1069	cpham@arb.ca.gov

Attachment: The Endicott Process Life Cycle Analysis

Attachment: Endicott CA-GREET Model Updated February 20, 2013

[submitted as separate Excel file]

Attachment: RFS2 Independent Engineering Report for Sabine

Attachment: Air Permitting Supplemental Information

Attachment: EPA Pathway Approval of Endicott Process at Sabine Facility