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April 23, 2013

California Air Resources Board
Stationary Source Division
Criteria Pollutants Branch - 6th Floor
1001 I Street
P.O. BOX 2815
Sacramento, CA 95812

Re: Method 2A Application- Excluding Confidential Business Information

Herewith, please find our application and supporting documents for a fuel lifecycle GHG emissions pathway using the Method 2A application process described in "Establishing New Fuel Pathways under the California Low Carbon Fuel Standard (LCFS) Procedures and Guidelines for Regulated Parties" report by ARB (California Air Resources Board) as updated on January 3, 2013, as well as the recently revised LCFS Regulations.

We seek two new pathways for our Grand Junction ethanol plant located in Grand Junction, Iowa to reflect its low energy use and different co-products. At our facility, we produce ethanol from U.S. corn. Our facility uses natural gas for its process energy and electricity from the local grid. We co-produce modified distillers grains solubles (MDGS), dry distillers grains solubles (DDGS) and corn oil.

The CARB LCFS regulations stipulate that only pathways lower in carbon intensity value than the main pathway they deviate from can use the Method 2A application. Our pathway is a sub-pathway of the Corn Ethanol (Midwest; Dry Mill; Dry DGS, NG) Pathway because, except for the points of deviation summarized below, our pathway is identical to the Corn Ethanol (Midwest; Dry Mill; Dry DGS, NG) Pathway described in the Detailed California-Modified GREET Pathway for Corn Ethanol Well-to-Wheel (WTW) lifecycle analysis.[1]

We have used the CA-GREET Model 1.8b to calculate the lifecycle greenhouse gas emissions from both new sub-pathways. Based on the input changes to the model described in the attachments, the carbon intensity value of the new pathway with 100% DDGS production is 89.56 gCO2e/MJ and the carbon intensity value of the new pathway with 100% MDGS production is 83.21 gCO2e/MJ. These CI intensity values and our production volumes more than meet the "5-10" substantiality rule and the other requirements of a new pathway.

The following sections to this application provide the details and documentation of our application for a new pathway under Method 2A. Portions of the following information that we consider Confidential

[1] Detailed California-Modified GREET Pathway for Corn Ethanol Well-to-Wheel (WTW) lifecycle analysis, Version 2.1, published February 27, 2009.

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Business Information have been clearly marked as such, *but are not included in this non-confidential version of the application. In this version of the application, the points where elements of Confidential Business Information have been removed from the text or accompanying tables are indicated so as to inform the public that the complete application to the ARB contained additional information to support this application, but that such information is considered by us to be Confidential Business Information.*

We request your approval and would be glad to answer any questions you may have about our application. Following please find the names and contact information of the persons who are available to answer any questions about our application. Please note that Houston BioFuels Consultants, LLC are assisting us with the application and may be contacted if you have questions or comments about our application

Affiliation:	Louis Dreyfus Commodities Grand Junction LLC	Houston BioFuels Consultants, LLC
Name:	Bruce Chapin	Mr. Logan Caldwell, Consultant
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Sincerely,

Bruce Chapin
Vice President

Attachments

Attachments

<u>Section Number and Contents</u>

I. WTW Diagram of Grand Junction Sub-Pathways of the Midwest Corn Ethanol Pathway

Figure 1: WTW Components of the Grand Junction Pathways are Identical to the Corn Ethanol (Midwest; Dry/Wet Mill; Dry DGS, NG) Pathway[2]

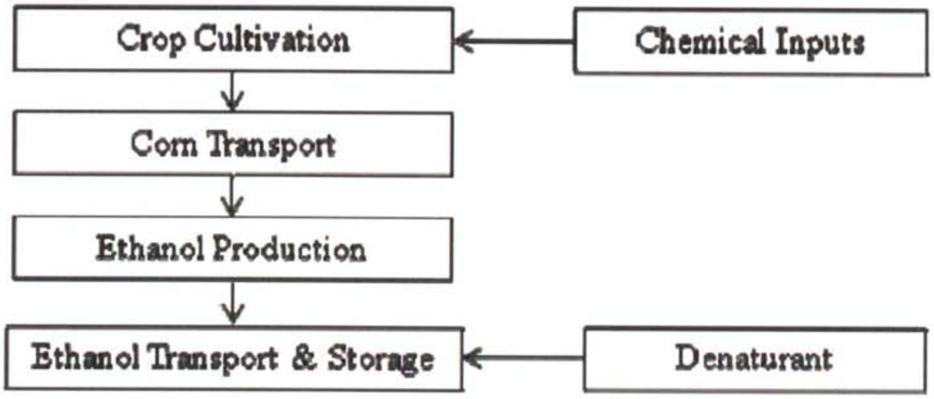


Figure 1. WTT Components for Ethanol Transported to California

[2] Detailed California-Modified GREET Pathway for Corn Ethanol Well-to-Wheel (WTW) lifecycle analysis, Page 4, Version 2.1, published February 27, 2009.

II. Grand Junction Plant Information - Confidential Business Information

1. EPA Facility ID Number

The EPA number is 3137 and the facility ID number is 70139.

2. Plant Location

The plant is located at 1149 U Avenue, Grand Junction, IA 50107.

3. History –

The plant starting grinding corn on April 26, 2009 and has been in operation since then.

4. Capacity Notes –

The Air Permit capacity is 125 MGY of denatured ethanol production. The original nameplate capacity was 110 MGY.

5. Technology –

The plant was designed by Fagen and the technology is from ICM Inc.

6. Feedstock Type –

Corn has be the sole feedstock for that plant since it started production and to this date.

7. Product

The plant has only been producing denatured ethanol for fuel use to this date.

8. Co-Products

The co products are partially modified distillers grains solubles (MDGS), and dried distillers grains solubles (DDGS). Corn oil is also produced.

9. Process fuel –

The fuel use for process is natural gas supplied by Northern Natural Gas.

10. Power supply –

The electricity used for power is supplied by Alliant Energy.

11. Process Flow Description – The following description and diagram of the dry mill process is from the ICM Inc. web site.

Delivery/Storage
Grain is delivered by truck or rail to the ethanol plant where it's loaded in storage bins designed to hold enough grain to supply the plant for 6-8 days.

Milling
The grain is screened to remove debris and ground into course flour.

Cooking (Hot Slurry, Primary Liquefaction, and Secondary Liquefaction)
During the cook process, the starch in the flour is physically and chemically prepared for fermentation.

Hot Slurry
The milled grain is mixed with process water, the pH is adjusted to about 5.8, and an alpha-amylase enzyme is added. The slurry is heated to 180–190°F for 30–45 minutes to reduce viscosity.

Primary Liquefaction
The slurry is then pumped through a pressurized jet cooker at 221°F and held for 5 minutes. The mixture is then cooled by an atmospheric or vacuum flash condenser.

Secondary Liquefaction
After the flash condensation cooling, the mixture is held for 1–2 hours at 180–190°F to give the alpha-amylase enzyme time to break down the starch into short chain dextrins. After pH and temperature adjustment, a second enzyme, glucoamylase, is added as the mixture is pumped into the fermentation tanks.

Simultaneous Saccharification Fermentation
Once inside the fermentation tanks, the mixture is referred to as mash. The glucoamylase enzyme breaks down the dextrins to form simple sugars. Yeast is added to convert the sugar to ethanol and carbon dioxide. The mash is then allowed to ferment for 40-50 hours, resulting in a mixture that contains about 15% ethanol as well as the solids from the grain and added yeast.

Distillation
The fermented mash is pumped into a multi-column distillation system where additional heat is added. The columns utilize the differences in the boiling points of ethanol and water to boil off and separate the ethanol. By the time the product stream is ready to leave the distillation columns, it contains about 95% ethanol by volume (190-proof). The residue from this process, called stillage, contains non-fermentable solids and water and is pumped out from the bottom of the columns into the centrifuges.

Dehydration
The 190-proof ethanol still contains about 5% water. It's passed through a molecular sieve to physically separate the remaining water from the ethanol based on the different sizes of

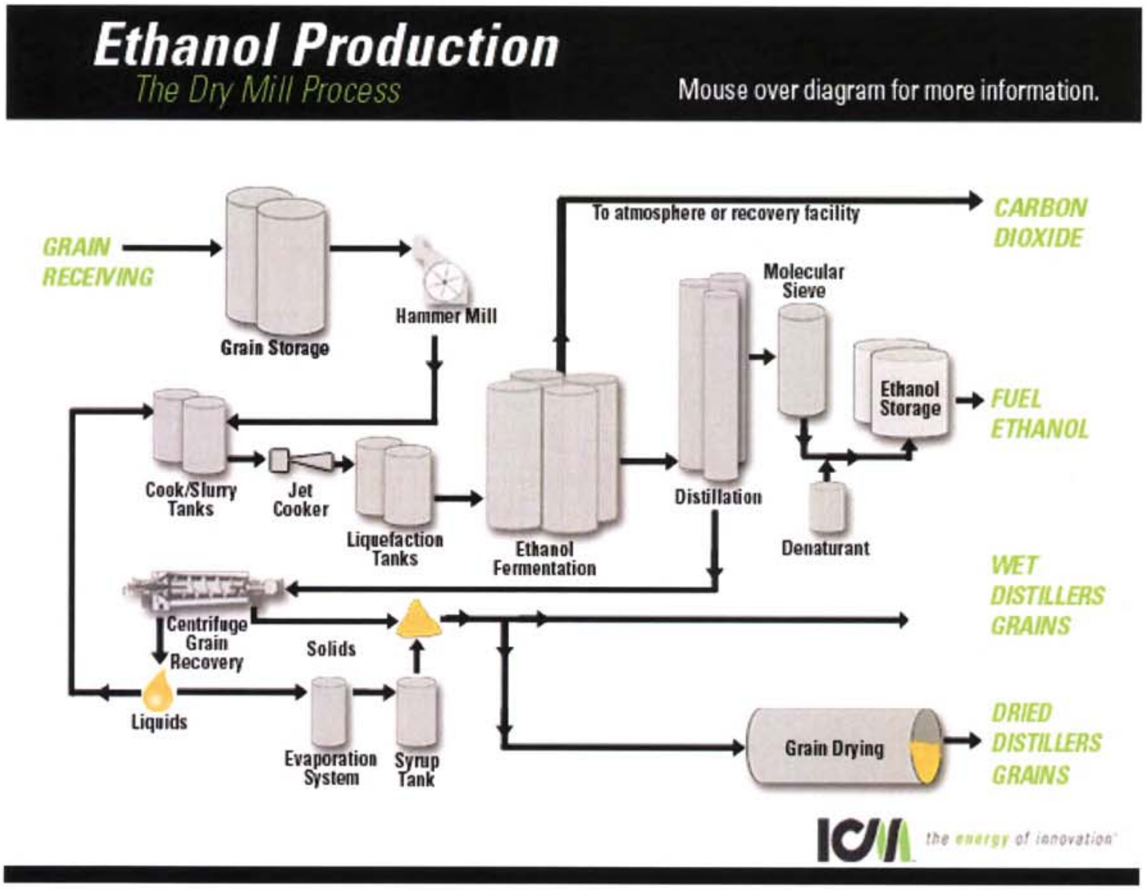
the molecules. This step produces 200-proof anhydrous (waterless) ethanol.

Ethanol Storage

Before the ethanol is sent to storage tanks, a small amount of denaturant is added, making it unfit for human consumption. Most ethanol plants' storage tanks are sized to allow storage of 7–10 days' production capacity.

12. Process Block Flow Diagram

Source: ICM Inc.



13. Energy and Material Balance. For legibility, the energy and material balance for the Grand Junction ethanol plant is contained in a separate pdf file accompanying the electronic version of this application and is a separated document in the printed, hard copy version of this application. **However, because it contains Confidential Business Information, it is not included in this non-confidential version of the application.**

14. In a separate document/electronic file accompanying this application due to its size, please find the latest version of the plant's air permits. These permits contain information about the equipment in the plant that generates emissions from the combustion of fuel.

III. Table of CA-GREET Model Inputs for Grand Junction Pathways - Confidential Business Information

Table 1: CA-GREET Model Inputs for the Grand Junction Pathway 100% DDGS

CA-GREET Model Sheet Name	Cell number	Default Pathway Value	Grand Junction 100% DDGS Pathway Value	Units	Description	Comments
Fuel_Prod_TS	L277	36,000	Confidential Business Information	btu/gal	Corn Ethanol Plant Energy Use, Dry Mill	With modern plant, lower power use
Fuel_Prod_TS	D277	2.72	Confidential Business Information	gal/bu	Ethanol yield of Corn Ethanol Plant, Dry Mill	With modern plant, optimized yield
Inputs	C247	10.19%	Confidential Business Information	%	Share of process energy for Electricity	With modern plant, lower power use
Inputs	C254	32,330	Confidential Business Information	btu/gal	Process fuel, 100%	Shown here for reference only. This cell is calculated based on cell L277 in Fuel_Prod_TS and Inputs C247
Inputs	C258	1.08	Confidential Business Information	kwh/gal	Electricity used for ethanol production	Shown here for reference only. This cell is calculated based on cell L277 in Fuel_Prod_TS and Inputs C247

Table 2: CA-GREET Model Inputs for the Grand Junction Pathway 100% MDGS

CA-GREET Model Sheet Name	Cell number	Default Pathway Value	Grand Junction 100% MDGS Pathway Value	Units	Description	Comments
Fuel_Prod_TS	L277	36,000	Confidential Business Information	btu/gal	Corn Ethanol Plant Energy Use, Dry Mill	With modern plant, lower power use
Fuel_Prod_TS	D277	2.72	Confidential Business Information	gal/bu	Ethanol yield of Corn Ethanol Plant, Dry Mill	With modern plant, optimized yield
Inputs	C247	10.19%	Confidential Business Information	%	Share of process energy for Electricity	With modern plant, lower power use
Inputs	C254	32,330	Confidential Business Information	btu/gal	Process fuel, 100%	Shown here for reference only. This cell is calculated based on cell L277 in Fuel_Prod_TS and Inputs C247
Inputs	C258	1.08	Confidential Business Information	kwh/gal	Electricity used for ethanol production	Shown here for reference only. This cell is calculated based on cell L277 in Fuel_Prod_TS and Inputs C247

IV. Basis for the Input Values - Confidential Business Information

The input values presented in this application are based on the period from January 2012 through December 2012, the "Production Period".

Table 3: Calculation of the Input Values for the 100% DDGS Case

Table 3 is considered Confidential Business Information and is not included in this non-confidential version of the application.

The fuel use per gallon is explained in the following section.

Table 4: Calculation of the Input Values for the 100% MDGS Case

Table 4 is considered Confidential Business Information and is not included in this non-confidential version of the application.

The fuel use per gallon is explained in the following section.

The plant simultaneously produces modified distillers grains solubles (MDGS) and dried distillers grains solubles (DDGS). To determine the amount of natural gas to produce ethanol while making just one or the other DGS products, [redacted] calculations have been carried out, as shown below, [redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted].

4 [redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

5 [redacted]

Table 5: Calculation of the Total Natural Gas Used During the Production Period, btu/gal, LHV

Table 5 is considered Confidential Business Information and is not included in this non-confidential version of the application.

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

V. CA-GREET Model Output and Analysis of Results

The Grand Junction pathway carbon intensity value is a sub-pathway of the Midwest, Dry-Mill, 100% DDGS Co-product, 100% natural gas fuel ethanol plant pathway. The carbon intensity value of the base pathway is 98.4 gCO2e/MJ. The carbon intensity value of the Grand Junction ethanol plant ethanol with 100% DDGS production is 89.56 gCO2e/MJ and with 100% MDGS production is 83.21 gCO2e/MJ.

Table 6: CI of Existing Midwest Dry Mill, 100% DDGS, 100% Natural Gas Fuel Pathway

CARB Lookup Table Reference Pathway: Midwest Dry Mill Ethanol Plant, 100% DDGS, NG Fuel Pathway							
		CA-GREET Model Output					
	IPPC factors	Corn	Ethanol	Calculations to convert Output to g/CO2e/MJ			
	gCO2e/g	*Btu or Grams per mmbtu of Fuel Throughput*				gCO2e/mmbtu	**gCO2e/MJ**
		US Avg Corn	100% DDGS	Corn w/loss	Total corn + EtOH		
Total energy		187,247	1,469,428	187,342	1,656,770		
VOC		16.768	55.519	17	72		
CO		151.276	31.385	151	183		
CH4	25	17.400	73.663	17	91	2,276.8	2.16
N2O	298	41.743	0.400	42	42	12,564.9	11.91
CO2	1	15,064	41,354	15,071	56,426	56,425.9	53.48
Sub-total lifecycle CI before denaturant and lt. vehicle combustion						71,267.6	67.55
Denaturant and lt. vehicle combustion effects factor							0.80
Total Lifecycle CI before ILUC with denaturant and lt. vehicle combustion effects included							68.35
Indirect Land Use Change Factor (ILUC)							30
Total CI of Pathway including Indirect Land Use Change							98.35
Note: The calculated result of this pathway prior to making the input changes for the subpathway ethanol plant is 67.55 gCO2e/MJ. This matches the Corn Ethanol WTW Analysis result of 67.6 gCO2e/MJ (Table B. GHG Emissions Summary for Dry and Wet Mill Corn Ethanol, page 5) before the denaturant and light vehicle combustion factor of 0.8 gCO2e/MJ is added.							

Table 7: CI Calculation of Grand Junction Ethanol Plant 100% DDGS

Grand Junction Ethanol Plant, Midwest Dry Mill Ethanol Plant Sub-Pathway, 100% DDGS, NG Fuel Pathway							
		CA-GREET Model Output					
	IPPC factors	Corn	Ethanol	Calculations to convert Output to g/CO2e/MJ			
	gCO2e/g	*Btu or Grams per mmbtu of Fuel Throughput*				gCO2e/mmbtu	**gCO2e/MJ**
		US Avg Corn	DDGS only	Corn w/ loss	Total Corn + EtOH		
Total energy		187,070	1,341,196	187,164	1,528,360		
VOC		16.752	54.517	17	71		
CO		151.133	24.929	151	176		
CH4	25	17.383	58.796	17	76	1,904.7	1.81
N2O	298	41.704	0.305	42	42	12,524.9	11.87
CO2	1	15,050	32,507	15,057	47,564	47,564.4	45.08
Sub-total lifecycle CI before denaturant and lt. vehicle combustion						61,994.1	58.76
Denaturant and lt. vehicle combustion effects factor							0.80
Total Lifecycle CI before ILUC with denaturant and lt. vehicle combustion effects included							59.56
Indirect Land Use Change Factor (ILUC)							30
Total CI of Pathway including Indirect Land Use Change							89.56

Table 8: CI Calculation of Grand Junction Ethanol Plant 100% MDGS

Grand Junction Ethanol Plant, Midwest Dry Mill Ethanol Plant Sub-Pathway, 100% MDGS, NG Fuel Pathway							
		CA-GREET Model Output					
	IPPC factors	Corn	Ethanol	Calculations to convert Output to g/CO2e/MJ			
	gCO2e/g	*Btu or Grams per mmbtu of Fuel Throughput*				gCO2e/mmbtu	**gCO2e/MJ**
		US Avg Corn	MDGS only	Corn w/ loss	Total Corn + EtOH		
Total energy		187,070	1,233,896	187,164	1,421,060		
VOC		16.752	53.688	17	70		
CO		151.133	21.497	151	173		
CH4	25	17.383	45.766	17	63	1,579.0	1.50
N2O	298	41.704	0.267	42	42	12,513.5	11.86
CO2	1	15,050	26,139	15,057	41,197	41,196.6	39.05
Sub-total lifecycle CI before denaturant and lt. vehicle combustion						55,289.1	52.41
Denaturant and lt. vehicle combustion effects factor							0.80
Total Lifecycle CI before ILUC with denaturant and lt. vehicle combustion effects included							53.21
Indirect Land Use Change Factor (ILUC)							30
Total CI of Pathway including Indirect Land Use Change							83.21

VI. Production Range of Grand Junction Pathways

The new pathways are applicable to the Grand Junction facility from 95 MGY to 122 MGY of ethanol production.

VII. Sustainability of Grand Junction Pathways

The Grand Junction facility was designed and constructed using well-established modern designs and equipment and is managed by professional staff well-qualified to assure that over time the energy efficiency of and emissions from the facility do not deteriorate. Any deterioration would result in a less profitable business. Thus the sustainability of the plant is well aligned with the business objectives of the owners.

VIII. Impact on Land Use

There is negligible difference between the land use of these sub-pathways and that of the Corn Ethanol (Midwest; Dry Mill; Dry DGS, NG) Pathway described in the Detailed California-Modified GREET Pathway for Corn Ethanol Well-to-Wheel (WTW) lifecycle analysis.[6].

[6] Detailed California-Modified GREET Pathway for Corn Ethanol Well-to-Wheel (WTW) lifecycle analysis, Version 2.1, published February 27, 2009.

IX. Documents supporting Annual Quantities of Ethanol, Natural Gas and Power – Confidential Business Information

Table 9: Summary of Inputs and Outputs during "Production Period"

Table 9 is considered Confidential Business Information and is not included in this non-confidential version of the application.

Documents authenticating the amounts shown in the table above are listed below.

Utility Invoices are shown in separate pdf files. These are:

- Natural Gas:
  - GJ NG Invoices Northern 2012.pdf
  - GJ NG Invoices Constellation 2011.pdf
- Electricity:
  - GJ Power Invoices Alliant 2012.pdf
  - GJ Power Invoices Alliant 2011.pdf

The natural gas invoices coincide with the calendar month and there are two pages for each month: one page is a summary for the month and the second page indicates daily amounts.

The electricity invoices are across multiple calendar months. To align the amount of electricity used during the 12 month production period and one month prior to the production period, the invoices have been tabulated and divided between the calendar months on a separate Excel Spreadsheet. This file is named:

- PRORATA POWER USAGE GRJ 22Feb13.xlsx

By separate file, please find a letter from Mr. Bruce Chapin, Vice President of Louis Dreyfus Commodities attesting to the accuracy and authenticity of the data used in this new pathway application.