CALGREN
Renewable Fuels
www.calgren.com

June 13, 2014

Re: Method 2A Application *xxx* - Excluding Confidential Business Information
Note: "xxx" in document shows where information has been redacted

California Air Resources Board
Industrial Strategies Division
Transportation Fuels Branch, Fuels Evaluation Section
1001 I Street
P.O. BOX 2815
Sacramento, CA 95812

To: The Executive Officer:

Herewith, please find our application and supporting documents for new fuel lifecycle GHG emissions pathways 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 nine new pathways for our GFP Ethanol, LLC dba Calgren Renewable Fuels ("Calgren Pixley") ethanol plant located near Pixley, California. At our facility, we produce ethanol from milo[1] and corn. Our facility uses natural gas, and has xxx the ability to use landfill gas and dairy digester gas for its process and cogeneration power fuel use. xxx We co-produce wet distillers grains solubles (WDGS) and extracted oil. The corn oil is used for a variety of purposes xxx. Since the corn oil extracted is less than xxx% by weight (dry matter basis) of our co-product production, it has been considered part of the DGS production for the purpose of the CI calculations.

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 pathways are either a sub-pathway of the Ethanol from Corn (California; Dry Mill; Wet DGS, NG) Pathway or

[1] Milo is synonymous with grain sorghum, which is often referred to as sorghum. For the purposes of this application these terms can be interchanged and in all cases refer to grain sorghum. Sweet sorghum is a different plant.

the Ethanol from Milo (Midwest; Dry Mill; Wet DGS, NG) Pathway depending on feedstock, because except for the points of deviation summarized below, our pathways are identical to the Corn Ethanol (California; Dry Mill; Wet DGS, NG) Pathway described in the Detailed California-Modified GREET Pathway for Corn Ethanol Well-to-Wheel (WTW) lifecycle analysis and the Detailed California-Modified GREET Pathway for Sorghum Ethanol.[2]

The plant has sufficient natural gas and landfill gas availability to operate with 100% of either fuel; and as such, there is a new pathway with each feedstock using 100% of each. Calgren has no plans to operate with different mixtures of natural gas and landfill gas. However, dairy digester gas xxx will provide xxx% of Calgren's fuel needs when xxx. Consequently, a new pathway is not requested for 100% dairy digester gas as fuel xxx. xxx.

We have used the CA-GREET Model 1.8b to calculate the lifecycle greenhouse gas emissions of these sub-pathways. The pathway descriptions and carbon intensity values based on the input changes to the model described in the attachments are shown in the following table.

Table 1: Calgren Pixley Pathway Descriptions and Carbon Intensity Values Summary

Calgren Pixley Ethanol Plant Pathways		
Feedstock	Fuel	CI, gCO2/MJ
Corn	100% NG	75.77
Corn	100% Landfill Gas	67.92
Corn	4% DDG and 96% NG	75.34
Milo, *no lime use*	100% NG	77.04
Milo, *no lime use*	100% Landfill Gas	69.19
Milo, *no lime use*	4% DDG and 96% NG	76.91
CA Corn, *no lime use*	100% NG	68.43
CA Corn, *no lime use*	100% Landfill Gas	60.74
CA Corn, *no lime use*	4% DDG and 96% NG	68.20

[2] Detailed California-Modified GREET Pathway for Corn Ethanol Well-to-Wheel (WTW) lifecycle analysis, Version 2.1, published February 27, 2009. Detailed California-Modified GREET Pathway for Sorghum Ethanol Well-to-Wheel (WTW) lifecycle analysis, Version 2.0, published December 28, 2010.

The following sections to this application provide the details and documentation of our application for new pathways under Method 2A. Portions of the following information are considered confidential business information and each page with "Contains Confidential Information" in the page header should be considered to contain confidential business information. Pages that have been redacted to remove confidential business information have "Non-Confidential, Redacted Version" in the header. Where redaction has occurs in the text, it is marked with one or more "x" symbols. The number of "x" symbols has no meaning. Each electronic file that includes the word "CONFIDENTIAL" in the file name should be considered to contain confidential business information. If the electronic file does not contain any confidential business information, the file name includes the word "PUBLIC".

We request your approval and would be glad to answer any questions you may have about our application.

Attachments

Section Number and Contents

I. WTW Diagram of Calgren Pixley Sub-Pathways of the Corn Ethanol (Midwest; Dry Mill; Dry DGS, NG) Pathway

II. Calgren Pixley Plant Information

III. Table of CA-GREET Model Inputs for Calgren Pixley Pathways

IV. Basis for the Input Values

V. CA-GREET Model Output and Analysis of Results

VI. Production Range of Calgren Pixley Pathway

VII. Sustainability of Calgren Pixley Pathway

VIII. Impact on Land Use

IX. Documents supporting Annual Quantities of Utilities, Feedstock and Products

I. WTW Diagram of Calgren Pixley Sub-Pathway of the Midwest Corn Ethanol Pathway

Figure 1: WTW Components of the Calgren Pixley Pathway are Essentially Identical to the Corn Ethanol (Midwest; Dry/Wet Mill; Dry DGS, NG) Pathway[3]

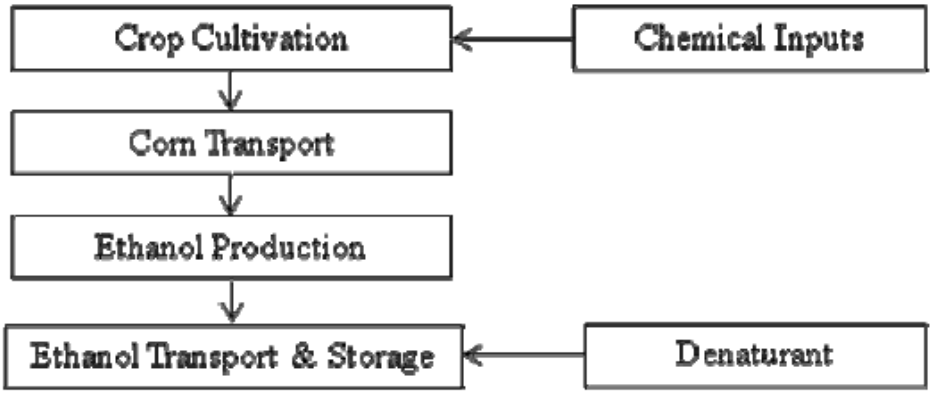


Figure 1. WTT Components for Ethanol Transported to California

Tank-To-Wheel (TTW) analysis includes actual combustion of fuel in a motor vehicle for motive power. Together WTT and TTW analysis are combined to provide Well-To-Wheel (WTW) analysis.

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

II. Calgren Pixley Plant Information

Calgren Pixley Plant Info

1. EPA Facility ID Number - 70317
2. Plant Location – Pixley, CA
3. History – The plant began production in July 2008 with new technology and was shut down in January 2009 to address operational issues. Production was restarted on August 1, 2009 and the plant has been running ever since.
4. Capacity Notes – The original permitted capacity was 55,000,000 gallons per year. The permit limit was increased to 60,000,000 gallons per year in 2010 xxx.
5. Technology – xxx
6. Feedstock Type – Corn and Milo
7. Product - Ethanol
8. Co-Products – WDGS and Extracted Oil (beginning in 2009). xxx
9. Process fuel – Natural Gas, Landfill Gas or Dairy Digester Gas. Natural gas is the primary process fuel, used in a combination heat and power (CHP) cogeneration facility. xxx.
10. Power supply –As noted above, the Calgren Pixley plant is powered by a cogeneration facility. xxx

11. Process Flow Description – The following is a description and diagram of the dry mill process.

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 fine flour (significantly finer than is typically the case).

Cooking (Hot Slurry and 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 and recycled waters and an alpha-amylase enzyme is added. The slurry is heated to 180–190°F for 30–45 minutes to reduce viscosity. Waste heat from DDE provides most of the energy required.

Liquefaction

The mixture is held for about 2 hours at 180–190°F to give the alpha-amylase enzyme time to break down the starch into dextrins. After temperature adjustment, a second enzyme, glucoamylase, is

added as the mixture is pumped into the fermentation tanks as mash.

Simultaneous Saccharification Fermentation

Inside the fermentation tanks, the glucoamylase enzyme breaks down the dextrins to form simple sugars. Added yeast converts the sugar to ethanol and carbon dioxide. The mash is then allowed to ferment for 65-70 hours, resulting in a beer that contains about 15.7 wt% ethanol as well as the solids from the grain and yeast.

Distillation

The beer is pumped into a two-column distillation system where the minimum amount of heat necessary to separate ethanol and water is added to the rectifier column. The columns utilize the differences in the boiling points of ethanol and water to boil off and separate the ethanol. The waste heat from the rectifier column is used in a second, beer-stripping column. By the time the vapor product stream is ready to leave the distillation columns, it contains about 95% ethanol by volume (190-proof). The residue from this process, called whole 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 vapor is passed through a molecular sieve pressure swing absorption system 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.

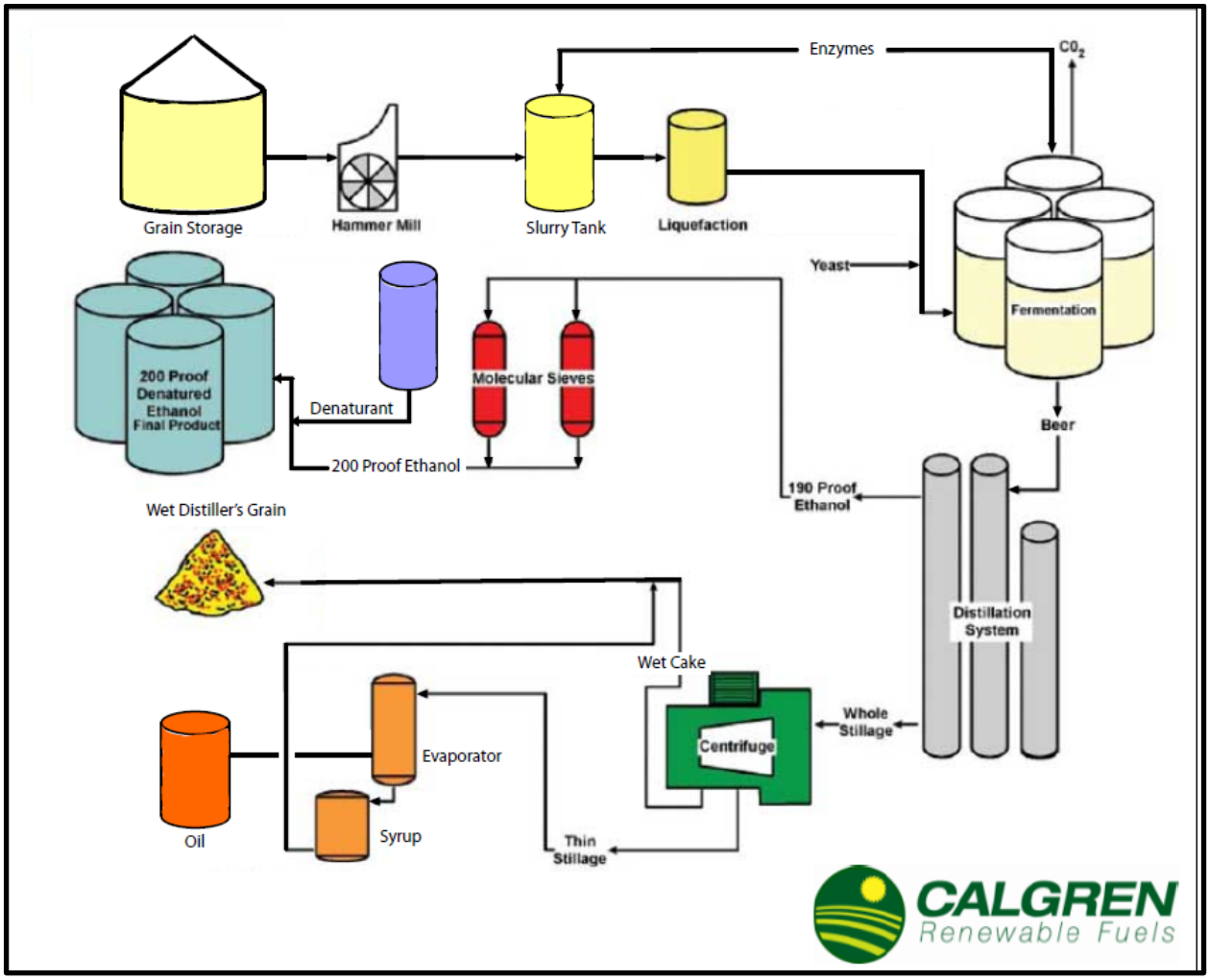
Centrifuges

Mechanical centrifuges separate whole stillage into solids (wet cake) and liquids (thin stillage/backset)

Evaporation

Thin stillage is concentrated in a two-effect series of evaporators using waste heat from the second distillation column. Water condensed from the second-effect evaporators is used in the cook process. Syrup from the final evaporator is mixed with wet cake to form WDGS.

12. Process Block Flow Diagram



13. 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. File name: *Calgren Current Air Permit PUBLIC 15Sep13.zip*.

III. Table of CA-GREET Model Inputs for Calgren Pixley Pathways

The following table depicts the inputs to the CA-GREET Model for the Calgren Pixley ethanol plant with corn feedstock from the Midwest, using natural gas for cogeneration unit fuel for process energy and power needs, and with emergency back-up power from the grid.

Table 2: CA-GREET Model Inputs for the Calgren Pixley
Midwest Corn Ethanol with NG Pathway

CA-GREET Model Sheet Name	Cell number	Default Pathway Value	California Dry Mill, NG, 100% WDGS Pathway Value	Calgren Pixley, California Pathway Value	Units	Description	Comments
Regional LT	C2	U.S. Avg-Midwest	Midwest- CA Marginal	Midwest- CA Marginal	n/a	Region for Analysis	Using Midwest for corn and CA-Marginal for CA ethanol production
Fuel_Prod_TS	L277	36,000	22,140	Business Confidential	btu/gal	Corn Ethanol Plant Energy Use, Dry Mill	With modern plant, lower power use
Fuel_Prod_TS	D277	2.72	2.72	Business Confidential	gal/bu	Ethanol yield of Corn Ethanol Plant, Dry Mill	With modern plant, optimized yield
T&D_Flowcharts	F1308	0%	100%	Business Confidential	%	Corn from Field to Stack	No change. Shown for reference only
T&D_Flowcharts	F1309	10	10	Business Confidential	miles	Corn from Field to Stack	No change. Shown for reference only
T&D_Flowcharts	M1308	0%	100%	Business Confidential	%	Corn % by Rail from Stack to Ethanol Plant	
T&D_Flowcharts	M1309	400	1,440	Business Confidential	miles	Distance from Corn Stack to Ethanol Plant	
T&D_Flowcharts	M1440	100%	100%	Business Confidential	%	Ethanol terminal to station	No change. Shown for reference only
T&D_Flowcharts	M1441	50	50	Business Confidential	miles	Truck to refueling station distance	No change. Shown for reference only
T&D_Flowcharts	F1441	100%	0%	Business Confidential	%	Percent shipped by rail	
T&D_Flowcharts	F1445	70%	100%	Business Confidential	%	Percent shipped by truck to Bulk Terminal	
T&D_Flowcharts	F1446	40	40	Business Confidential	miles	Percent shipped by truck to Bulk Terminal	No change. Shown for reference only
Inputs	C247	10.19%	10.172%	Business Confidential	%	Share of process energy for Electricity	With modern plant, lower power use

The following table shows the inputs that have changed from the values shown in Table 2 when Calgren Pixley is using Landfill Gas or Dairy Digester Gas instead of natural gas. This table and the CA-GREET calculations are applicable to both corn ethanol pathways using either Landfill Gas or Dairy Digester Gas. xxx

Table 3: CA-GREET Model Inputs for the Calgren Pixley Corn Ethanol with either Landfill or Dairy Digester Gas Pathways

CA-GREET Model Sheet Name	Cell number	Default Pathway Value	California Dry Mill, NG, 100% WDGS Pathway Value	Calgren Pixley, California Pathway Value	Units	Description	Comments
Fuel_Prod_TS	L277	36,000	22,140	Business Confidential	btu/gal	Corn Ethanol Plant Energy Use, Dry Mill	With modern plant, lower power use
Inputs	C247	10.19%	10.172%	Business Confidential	%	Share of process energy for Electricity	With modern plant, lower power use

When Calgren Pixley uses corn grown in California, the corn transportation from the field to the ethanol plant input value changes. In addition, where the corn is sourced in California, the soil has a naturally high pH and no lime fertilizer is applied. The following table shows the changes in the CA-GREET input model for the cases with corn feedstock sourced in California. xxx

Table 4: CA-GREET Model Inputs for the Calgren Pixley Pathway California Corn Feedstock

CA-GREET Model Sheet Name	Cell number	Default Pathway Value	California Dry Mill, NG, 100% WDGS Pathway Value	Calgren Pixley, California Pathway Value	Units	Description	Comments
Regional LT	C2	U.S. Avg-Midwest	Midwest- CA Marginal	Midwest- CA Marginal	n/a	Region for Analysis	Using Midwest for corn and CA-Marginal for CA ethanol production
Fuel_Prod_TS	M1308	0%	100%	Business Confidential	n/a	Corn % by Rail from Stack to Ethanol Plant	CA corn, none by rail, all by truck
Fuel_Prod_TS	M1313	100%	0%	Business Confidential	n/a	Corne Per cent by Truck from Stack to Ethanol	Trucking accounted for in F1309
Fuel_Prod_TS	F1309	10	10	Business Confidential	miles	Corn from Field to Stack	Distance from field to Ethanol Plant
Fuel_Prod_TS	T263	1,202.0	1,202.0	Business Confidential	grams/bushel	CaCO3 Fertilizer Use for Corn Farming	No lime used due to naturally high soil pH

The following table depicts the inputs to the CA-GREET Model for the Calgren Pixley ethanol plant with grain sorghum ("milo") feedstock grown without using lime, using natural gas cogeneration unit fuel for process energy and power needs, and xxx.

Table 5: CA-GREET Model Inputs for the Calgren Pixley Milo Feedstock with NG Pathway

CA-GREET Model Sheet Name	Cell number	Grain Sorghum 100% WDGS	California Dry Mill, NG, 100% WDGS	Calgren Pixley, California	Units	Description	Comments
		Pathway Value	Pathway Value	Pathway Value			
Fuel_Prod_TS	CU271	26,100	22,140	Business Confidential	btu/gal	Corn Ethanol Plant Energy Use, Default is 100% Dry Mill	Input added by CARB for Grain Sorghum default pathway.
Inputs	E247	10.19%	10.172%	Business Confidential	%	Electricity used as % of total energy used for ethanol production	Input added by CARB for Grain Sorghum default pathway.
Inputs	E254	22,430	19,888	Business Confidential	btu/gal	Process fuel for 100% WDGS	Input added by CARB for Grain Sorghum default pathway.
Inputs	E258	0.78	0.66	Business Confidential	kwh/gal	Electricity used for ethanol production	
EtOH	DH165	2,661	2,252	Business Confidential	btu/gal	Electricity used for ethanol production	
Inputs	D235	2.72	2.72	Business Confidential	gal/bu	Ethanol yield of Dry Mill using Grain Sorghuma	Input added by CARB for Grain Sorghum default pathway.
Regional LT	C2	Midwest	CA Marginal	Business Confidential	n/a	Region for Analysis	For CA Ethanol Production
Regional LT	C2	Midwest	Midwest	Business Confidential	n/a	Region for Analysis	
T&D_Flowcharts	F1308	0%	100%	Business Confidential	%	Corn from Field to Stack	
T&D_Flowcharts	F1309	10	10	Business Confidential	miles	Corn from Field to Stack	
T&D_Flowcharts	M1308	0%	100%	Business Confidential	%	Corn % by Rail from Stack to Ethanol Plant	
T&D_Flowcharts	M1309	400	1,440	Business Confidential	miles	Distance from Corn Stack to Ethanol Plant	
T&D_Flowcharts	M1440	100%	100%	Business Confidential	%	Ethanol terminal to station	
T&D_Flowcharts	M1441	50	50	Business Confidential	miles	Truck to refueling station distance	
T&D_Flowcharts	F1441	100%	0%	Business Confidential	%	Percent shipped by rail	
T&D_Flowcharts	F1445	70%	100%	Business Confidential	%	Percent shipped by truck to Bulk Terminal	
T&D_Flowcharts	F1446	40	40	Business Confidential	miles	Percent shipped by truck to Bulk Terminal	

The following table shows the inputs that have changed from the values shown in Table 5 when Calgren Pixley is using milo as feedstock, and is using either Landfill Gas or Dairy Digester Gas instead of natural gas.

Table 6: CA-GREET Model Inputs for the Calgren Pixley
Milo Feedstock with either Landfill or Dairy Digester Gas Pathways

CA-GREET Model Sheet Name	Cell number	Grain Sorghum 100% WDGS	California Dry Mill, NG, 100% WDGS	Calgren Pixley, California	Units	Description	Comments
		Pathway Value	Pathway Value	Pathway Value			
Fuel_Prod_TS	CU271	22,430	19,888	Business Confidential	btu/gal	Corn Ethanol Plant Energy Use, Default is 100% Dry Mill	Input added by CARB for Grain Sorghum default pathway.
Inputs	E254	22,430	19,888	Business Confidential	btu/gal	Process fuel for 100% WDGS	Input added by CARB for Grain Sorghum default pathway.
Inputs	E247	10.19%	10.172%	Business Confidential	%	Electricity used as % of total energy used for ethanol production	Input added by CARB for Grain Sorghum default pathway. With modern plant, optimized yield

IV. Basis for the Input Values

Corn Oil Considerations

The Calgren Pixley plant extracts corn oil from the distillers grains co-product stream. Corn oil production averaged xxx pounds of corn oil per gallon of ethanol produced during the production period. This production amount is expected to continue at this level. By comparison, the default DGS production on a bone dry basis is 5.34 pounds of DGS per gallon of ethanol in the default corn dry-mill pathway. The DGS in the default pathway includes the corn oil since there is no extraction of corn oil in the default pathway process flow sequence. The corn oil extracted by Calgren Pixley is approximately xxx of the DGS production before corn oil extraction. Corn oil from the Calgren Pixley plant is used for several types of animal feed and may be used at some point for biodiesel production. Given the relatively small amount of extracted corn oil to the total DGS production, and the relatively small fraction of the CI represented by co-product production, for the purpose of calculating the CI of the Calgren Pixley new pathways, the corn oil has been assumed to be part of the DGS production.

Milo Used as Feedstock

In the Great Plains region where Calgren sources its milo, there is no need for lime to be used to treat the soil used to grow milo because of the inherent high pH nature of the soil there. As reference, included with this new pathway application, please find a letter from xxx

xxx

California Corn Used as Feedstock

xxx The soil where corn is grown in California and sourced for the Calgren plant has a naturally high pH, and consequently no lime is used to adjust the soil pH. To document the non-use of lime, please refer to the letter accompanying this application in a separate file named xxx

Ethanol Production

The input values presented in this application are based on the period from xxx through xxx, the "Production Period." xxx The following table shows the calculation of the input values based on the data from the production period.

Table 7: Calculation of the Input Values for the Calgren Pixley Pathway

This table is considered Confidential Business Information and is not included in this non-confidential, redacted version of the application.

Natural Gas

- xxx

xxx

V. CA-GREET Model Output and Analysis of Results

The Calgren Pixley corn ethanol pathway carbon intensity values are a sub-pathway of the California, Dry-Mill, 100% WDGS Co-product, 100% natural gas fuel ethanol plant pathway that has a carbon intensity value of 80.70 gCO2e/MJ. The following table shows the calculation of the default California pathway

Table 8: CI of Existing California Dry Mill, 100% WDGS, 100% Natural Gas Fuel Pathway

CA Plant Sub-Pathway of the Midwest Dry Mill Ethanol Plant, 100% WDGS, NG Fuel, CA Marginal Power try to match Look up Table							
		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**
		Midwest	California Plant	Corn w/ loss	Total Corn + EtOH		
Total energy		235,738	1,175,037	235,857	1,410,894		
VOC		19.737	51.950	20	72		
CO		161.118	11.665	161	173		
CH4	25	22.008	39.931	22	62	1,548.7	1.47
N2O	298	41.847	0.190	42	42	12,533.3	11.88
CO2	1	18,794	19,848	18,804	38,652	38,652.1	36.64
Sub-total lifecycle CI before denaturant and lt. vehicle combustion						52,734.2	49.98
Denaturant and lt. vehicle combustion effects factor							0.80
Total Lifecycle CI before ILUC with denaturant and lt. vehicle combustion effects included							50.78
Indirect Land Use Change Factor (ILUC)							30
Total CI of Pathway including Indirect Land Use Change							80.78

Note: The results using the CA-GREET model prior to making the input changes for the Pixley ethanol plant is 49.98 gCO2e/MJ. This is slightly more than the California Dry Mill Default Pathway of 49.9 gCO2e/MJ before the denaturant and light vehicle combustion factor of 0.8 gCO2e/MJ is added. The differences appear to be due to changes in the model between the time the default pathway was calculated and the model was issued.

xxx

xxx

xxx

Table 9: Summary of LCA of Landfill Gas Relevant to its Use For Ethanol Production

This table is considered Confidential Business Information and is not included in this non-confidential, redacted version of the application.

Table 10: Tank-to-Wheel, Carbon-in Fuel Emissions for Landfill Gas and Dairy Digester Gas based on NG

This table is considered Confidential Business Information and is not included in this non-confidential, redacted version of the application.

xxx

Table 11: Calculation of Landfill Gas Used For Ethanol Production CI Based on the Calgren Pixley Ethanol Plant's Actual Process Energy Requirement (LHV basis)

This table is considered Confidential Business Information and is not included in this non-confidential, redacted version of the application.

xxx

Table 12: Summary of LCA of Dairy Digester Gas Relevant to its Use For Ethanol Production

This table is considered Confidential Business Information and is not included in this non-confidential, redacted version of the application.

The contribution of Dairy Digester Gas used as a fuel for ethanol production is calculated based on the actual process energy used by Calgren Pixley during the production period.

Table 13: Calculation of Dairy Digester Gas Used for Ethanol Production CI Based on Calgren Pixley Ethanol Plant's Actual Process Energy Requirement (LHV basis)

This table is considered Confidential Business Information and is not included in this non-confidential, redacted version of the application.

xxx

xxx

New Pathway CI Calculations

The following tables show the calculation of the Calgren Pixley corn ethanol feedstock pathways.

Table 14: Calgren Pixley CI Calculation, MW Corn, Actual DGS yield, with Landfill Gas Fuel

This table is considered Confidential Business Information and is not included in this non-confidential, redacted version of the application.

Table 15: Calgren CI Calculation, MW Corn, Actual DGS yield, xxx Dairy Digester Gas

This table is considered Confidential Business Information and is not included in this non-confidential, redacted version of the application.

Table 16: Calgren Pixley CI Calculation, MW Corn, Actual DGS yield, with Natural Gas

This table is considered Confidential Business Information and is not included in this non-confidential, redacted version of the application.

California Corn CI Calculations

With the locally grown corn, the average distance from the field to the Calgren Pixley plant is no more than xxx miles. The following table compares the energy and emissions of the default transportation from the Midwest to California with the transportation of California Corn. The CI of corn transportation is xxx gCO2e/MJ lower for California corn than Midwest corn.

Table 17: CI Calculation of Calgren Pixley Pathway: California Corn Transportation Difference

This table is considered Confidential Business Information and is not included in this non-confidential, redacted version of the application.

Corn grown in California used by Calgren Pixley is from farm land that has a naturally high pH and does not require any lime fertilizer. To determine the CI impact of no lime use, the CA-GREET model was run with the default lime setting and with the lime use set to zero. xxx

Table 18: CI Calculation of Calgren Pixley Pathway: California Corn No Lime Use CI Reduction from Default Value

This table is considered Confidential Business Information and is not included in this non-confidential, redacted version of the application.

xxx

xxx

The Calgren Pixley milo ethanol pathways are sub-pathways of the default Midwest, Dry-Mill, 100% WDGS Co-product, 100% natural gas fuel ethanol plant with grain sorghum feedstock pathway. The carbon intensity value of the default pathway is 85.81 gCO2e/MJ.

xxx

Table 19: CI Calculation of Calgren Pixley Pathway, Milo Feedstock with No Lime Use and Landfill Gas Fuel

This table is considered Confidential Business Information and is not included in this non-confidential, redacted version of the application.

Table 20: CI Calculation of Calgren Pixley Pathway, Milo Feedstock with No Lime Use and Dairy Digester Gas Fuel

This table is considered Confidential Business Information and is not included in this non-confidential, redacted version of the application.

Table 21: CI Calculation of Calgren Pixley Pathway, Milo Feedstock with No Lime Use and Natural Gas Fuel

This table is considered Confidential Business Information and is not included in this non-confidential, redacted version of the application.

VI. Production Range of Calgren Pixley Pathway

As stated in the Calgren Pixley Method 2A application form, the new pathways are applicable to the Pixley facilities for at least 45 MGY to 60 MGY of ethanol production.

VII. Sustainability of Calgren Pixley Pathway

The Calgren Pixley 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 this sub-pathway and that of the Corn Ethanol (California; Dry Mill; Dry DGS, NG) Pathway described in the Detailed California-Modified GREET Pathway for Corn Ethanol Well-to-Wheel (WTW) lifecycle analysis and the Detailed California-Modified GREET Pathway for Sorghum Ethanol [4].

[4] Detailed California-Modified GREET Pathway for Corn Ethanol Well-to-Wheel (WTW) lifecycle analysis, Version 2.1, published February 27, 2009. Detailed California-Modified GREET Pathway for Sorghum Ethanol Well-to-Wheel (WTW) lifecycle analysis, Version 2.0, published December 28, 2010.

IX. Documents supporting Annual Quantities of Utilities, Feedstock and Products

Table 25: Summary of Inputs and Outputs during "Production Period"

xxx

This table is considered Confidential Business Information and is not included in this non-confidential, redacted version of the application.

xxx

The utilities quantities in the preceding table showing the actual monthly utility use are documented by the utility invoices with the files named:

- *NG Invoices Feb11_Jan12 CONFIDENTIAL 16Sep13.pdf*
- *NG Invoices Feb12_Jan13 CONFIDENTIAL 16Sep13.pdf*
- *Electricity NG Invoices Feb11_Jan12 CONFIDENTIAL 16Sep13.pdf*
- *Electricity Invoices Feb12_Jan13 CONFIDENTIAL 16Sep13.pdf*

The monthly electricity invoices are pro-rated into the calendar months they cover in a separate spreadsheet, with the file named:

- *Power Invoice Summary by months 2011-2013 CONFIDENTIAL 3May13.xlsx*

The monthly natural gas invoices subdivide the gas consumed into two quantities and do not show a total on the invoice. The monthly amount consumed is the total of the two quantities shown. The total amount for each month and the quantities shown on the invoices are detailed in a separate spreadsheet, with the file named:

- *NG Invoices showing subtotals per month CONFIDENTIAL 17Sep13.xlsx*

xxx