Fuel Pathway Staff Summary
WE Hereford, LLC

Deemed Complete Date: July 10, 2013
Certified and Posted Date: August 1, 2013

Plant Summary

WE Hereford, LLC (WEH) produces ethanol from corn and grain sorghum at a dry mill plant in Hereford, Texas. The plant has applied for four Method 2A pathways (two corn and two sorghum pathways) under the California Low Carbon Fuel Standard (LCFS). WEH currently has 12 pathways that were previously approved and posted on the LCFS Method 2 website on January 12, 2011. WEH intends the four new sub-pathways described below to augment rather than replace its 12 existing pathways.

WEH plant is an ICM-designed facility with a nameplate capacity of 100 million gallons per year of denatured ethanol. According to the Operating Permit issued by the Texas Commission on Environmental Quality, the plant can produce up to 120 million gallons of denatured ethanol per rolling twelve-month period. The plant is a natural-gas-fired facility producing both wet and partially dried (or "modified") distiller's grains with solubles (DGS). As shown in Table 1, the four pathways proposed by WEH are differentiated by feedstock and the proportion of total DGS that is partially dried. For each feedstock, the same two DGS proportions are specified: 100 percent wet DGS and 100 percent modified DGS. As more DGS is dried, more natural gas is used. Modified DGS has a moisture content of approximately 50 percent while wet DGS contains approximately 65 percent moisture.

Carbon Intensity of Ethanol Produced

As shown in Table 1, WEH is applying for four Method 2A pathways with carbon intensities (CIs) ranging from 79.51 to 83.35 gCO_2e/MJ for corn and 78.76 to 82.60 gCO_2e/MJ for sorghum. Proposed Method 2A pathways must be evaluated against reference pathways from the LCFS Lookup table. Although a Method 2A pathway must be very similar to its reference pathway, it must achieve at least a five gram CO_2e/MJ CI improvement over that pathway.[1] The reference pathways for WEH's corn pathways are pathways ETHC008 and ETHC004 (Midwest dry mill, natural gas, wet and dry DGS pathways respectively). The reference pathways for WEH's sorghum pathways are pathways ETHG002 and ETHG001 (Midwest dry mill, natural gas, wet and dry DGS pathways, respectively). All of WEH's proposed pathways improve upon their reference pathways by more than the requisite five grams of CO_2e/MJ.

This CI improvement was made possible by reduced process energy consumption due to the plant's efficient design. ICM Inc. designed the WEH plant to achieve reductions in both thermal and electrical energy consumption. As a result, it improves upon both the

[1] In the LCFS regulation, this 5 gCO_2e/MJ threshold is referred to as a "substantiality requirement."

thermal and electrical energy consumption levels assumed for the reference pathways (thermal energy use of 22,430 and 32,330 BTU per gallon for the wet and dry DGS pathways, respectively; electrical energy use of 1.08 kW-hr per gallon for the both the wet and dry DGS pathways).[2]

Table 1: Proposed Lookup Table Entries

	Pathway Identifier	Pathway Description†	Carbon Intensity in gCO_2e/MJ (Including Indirect Effects)		
			Direct Emission	Land Use or Other Indirect Effect	Total
Ethanol from Corn	ETHC078	2A Application*: Texas; dry mill; Wet DGS; NG	49.51	30	79.51
Ethanol from Corn	ETHC079	2A Application*: Texas; dry mill; Modified DGS; NG	53.35	30	83.35
Ethanol from Sorghum	ETHG008	2A Application*: Texas; dry mill; Wet DGS; NG	48.76	30	78.76
Ethanol from Sorghum	ETHG009	2A Application*: Texas; dry mill; Modified DGS; NG	52.60	30	82.60

†The applicant describes these as "Midwest" pathways in its life cycle analysis report. That designation reflects the energy mix used to calculate the pathway CI. This table simply identifies where the feedstock and the fuel are produced

*Specific Conditions Apply

Operating Conditions

Certification of the four pathways described herein will be subject to the following operating conditions:

- WEH's pathway CIs are based on corn and sorghum ethanol yields as well as DGS yields that are different from the default yield values on which the LCFS reference pathways are based.[3] WEH may use these pathways only to report the sale of volumes produced at or above the yields specified in the method 2A application summarized herein. Yields may be calculated using any accounting period up to and including one year, and may exclude periods of abnormal operations, such as planned maintenance or unpredictable, unavoidable, and uncontrollable *force majeure* events. Should the production yield fall below the values used in its application, WEH shall not sell the volumes associated with those lower yields in California under the pathways described in this Staff summary.

[2] Actual WEH plant energy use values are classified as confidential business information and not reported herein.
[3] WEH's ethanol yield values are classified as confidential business information and not reported herein.

- The total pathway-specific thermal and electrical energy use values per gallon reported in the WEH Method 2A application may only be exceeded if the actual production CI remains at or below the LCFS-certified CI. These values are classified by the applicant as confidential business information. Pathway-specific energy use values may be calculated using any accounting period up to and including one year, and may exclude periods of abnormal operations, such as planned maintenance or unpredictable, unavoidable, and uncontrollable *force majeure* events.
- The staff approval granted in this document extends to ethanol production associated with 100 percent wet DGS and 100 percent modified DGS. The 100 percent wet DGS CI shall only be applied to ethanol volumes produced when no DGS drying occurs. The 100 percent modified DGS CI may be applied only to volumes associated with partially dried DGS containing no less than 50 percent moisture.

In order for WEH to sell ethanol in California under the CIs appearing in Table 1, these three conditions must be met for every gallon sold.

Staff Analysis and Recommendation

Staff has reviewed the WE Hereford, LLC application and has replicated, using the CA-GREET spreadsheet, the carbon intensity values calculated by WEH. WE Hereford, LLC has provided documentation verifying the plant's natural gas and electrical energy use and has estimated with sufficient accuracy the energy consumed by the DGS dryer. Staff is satisfied that the energy values presented in the application accurately represent the plant's actual thermal and electrical energy consumption. Consequently, staff believes that the carbon intensity values appearing in Table 1 accurately represent the carbon intensity values of the ethanol produced (and to be produced) at WEH plant. Staff recommends that the WEH's Method 2A application for two corn and two sorghum ethanol pathways be approved.