

**Method 2A Fuel Pathway Summary:
Siouxland Energy and Livestock Cooperative, Sioux Center, Iowa**

Plant Summary

Siouxland Energy and Livestock Cooperative (Siouxland) produces corn ethanol at a dry mill plant located in Sioux Center, Iowa. According to the air permit issued by the Iowa Department of Natural Resources, the plant’s maximum production capacity is 65 million gallons of ethanol annually. About 15 million gallons of the ethanol from this plant is shipped to California. The plant is a dry mill, ICM-designed, natural gas-fired plant producing distillers’ grains with solubles (DGS). DGS is a corn ethanol co-product which primarily replaces corn in livestock feed rations. The DGS produced at the Siouxland plant is 100 percent wet DGS (WDGS). The Siouxland plant also produces corn oil as a co-product. The two co-products (WDGS and corn oil) are sold as livestock feed, though some corn oil is occasionally sold to biodiesel producers. Siouxland has not included a corn oil co-product credit in its carbon intensity calculations. Because no corn oil credit is claimed, and because much of the extracted corn oil remains in the livestock feed market, Siouxland’s carbon intensity includes the default DGS co-product credit.

Carbon Intensity of the Fuel Produced

The single CI for which Siouxland is applying reflects the energy consumed for the production of ethanol and the two co-products described above. Excluding land-use-change emissions, the carbon intensity of the Sioux Center plant, as calculated by Siouxland, is 52.34 gCO₂e/MJ of ethanol produced. When 30 gCO₂e/MJ of land use change emissions are included, the total carbon intensity of the Sioux Center plant becomes 82.34 gCO₂e/MJ. The reference carbon intensity from the LCFS Lookup Table is 90.10 gCO₂e/MJ for Midwestern gas-fired plants producing WDGS. Because the proposed carbon intensity is five or more gCO₂e/MJ below the reference pathway carbon intensity, the proposed pathway meets the LCFS substantiality requirement. Table 1 shows the carbon intensity value for the Sioux Center Plant.

Table 1: Proposed Lookup Table Entries

Fuel/Feedstock	Proposed Lookup Table Pathway Description	Carbon Intensity in gCO₂e/MJ (Including Indirect Effects)	Do Special Conditions Apply? (Y/N)¹
Ethanol/Corn	Midwest, Dry-Mill, wet DGS, Natural Gas	82.34	Y

¹The special conditions to which this column refers are discussed in the “Carbon Intensity of the Fuel Produced” section of this summary.

The Sioux Center plant achieves a lower carbon intensity value relative to the reference pathway through its modern design which reduces energy use. Thermal energy consumption at the Sioux Center plant is below the 22,430 BTU per gallon energy use value that forms the basis of the carbon intensity of the reference WDGS pathway. Electricity use at the Sioux Center plant is also below the 1.08 kw-hr per gallon that is assumed for the reference pathway¹. The thermal energy and electricity use values appearing in the Siouxland application will become operating conditions upon approval of that application by the Executive Officer². These conditions effectively limit Sioux Center to the production of no less than 100 percent WDGS for the ethanol sold into the California market: any drying of its DGS co-product will increase energy consumption and carbon intensity beyond the values specified in the company's Method 2A application. Until the Executive Officer acts on the Siouxland application, the plant's thermal energy use and electricity use values shall not exceed the values reported in the application. These values are classified by the applicant as confidential business information.

Staff Analysis and Recommendation

ARB staff has reviewed the Siouxland Sioux Center plant's application and has replicated, using the CA-GREET model, the carbon intensity value calculated by the applicant. Siouxland provided documentation for the plant's energy usage and ethanol production. Staff is satisfied that the energy consumption values in the application accurately represent the Sioux Center plant's actual energy usage. Staff believes that the carbon intensity value reported by Siouxland can be sustained. Consequently, staff believes that the carbon intensity value of 82.34 gCO₂e/MJ for corn ethanol proposed by Siouxland accurately represents that plant's carbon intensity. Staff recommends, therefore, that the Sioux Center Plant's application for a Method 2A Ethanol pathway be approved.

¹Actual plant energy use values are classified as confidential business information and not reported herein.

²The energy and electricity use values appearing in the Siouxland Sioux Center application will become operating conditions upon approval of that application by the Executive Officer unless the Executive Officer modifies those values—in which case the revised values will become operating conditions.