



OFFICE OF AIR AND RADIATION

WASHINGTON, D.C. 20460

April 29, 2024

Mr. Rand Dueweke
Executive Vice President
9 West Broad Street
Suite #400
Stamford, Connecticut 06902

Dear Mr. Dueweke

Verbio North America petitioned the Agency to approve a pathway for the generation of renewable fuel (D-code 6) Renewable Identification Numbers (RINs) under the renewable fuel standard (RFS) program for ethanol produced through a dry mill process at your production facility located in Nevada, Iowa using corn starch as feedstock (the “Verbio Nevada Corn Process”).

Through the petition process described under 40 CFR 80.1416, Verbio submitted data to the U.S. Environmental Protection Agency to perform a lifecycle greenhouse gas (GHG) emissions analysis of the fuel produced through the Verbio Nevada Corn Process. This analysis involved a straightforward application of the same methodology and much of the same modeling used for the final rule published on March 26, 2010 (75 FR 14670) (the “March 2010 RFS rule”). The difference between this analysis and the analyses completed for the March 2010 RFS rule was the evaluation of a more efficient fuel production process.

The attached document “Verbio Nevada Corn Ethanol Fuel Pathway Determination under the RFS Program” describes the data submitted by Verbio, the analysis conducted by the EPA, and our determination of the lifecycle greenhouse gas emissions associated with the fuel production pathway described in the Verbio petition.

Based on our assessment, the corn starch ethanol produced through the Verbio Nevada Corn Process qualifies under the Clean Air Act (CAA) for renewable fuel (D-code 6) RINs, provided the fuel satisfies the conditions and associated regulatory provisions discussed in the attached document as well as the other criteria for renewable fuel (e.g., production from renewable biomass, and used to reduce or replace petroleum-based transportation fuel, heating oil or jet fuel) specified in the CAA and in the EPA’s implementing regulations.

This approval applies only to the Verbio Nevada facility and to the process, materials used, fuel produced, and process energy sources as outlined and described in the petition submitted by Verbio.

The OTAQ Reg: Fuels Programs Registration and OTAQ EMTS Application will be modified to allow Verbio to register and generate RINs for the production of ethanol from corn starch feedstock using the "Verbio Nevada Corn Process."

Sincerely,

Byron J. Bunker, Director
Implementation, Analysis and Compliance Division
Office of Transportation and Air Quality

Enclosure

Verbio Nevada Corn Ethanol Fuel Pathway Determination under the RFS Program

Office of Transportation and Air Quality

Summary: Verbio North America submitted a petition (the “Verbio petition”), dated September 22, 2023, requesting that the EPA approve their generation of renewable fuel (D-code 6) Renewable Identification Numbers (RINs) under the Renewable Fuel Standard (RFS) program for ethanol produced through a dry mill process at their production facility located in Nevada, Iowa, using corn starch as feedstock (the “Verbio Nevada Corn Process”).

Although this determination is conditioned upon Verbio documenting on an ongoing basis that the corn ethanol it produces at its Nevada, Iowa, facility through the Verbio Nevada Corn Process meets the appropriate greenhouse gas (GHG) emissions reduction requirements, EPA has performed a threshold lifecycle GHG emissions analysis based on the information in the Verbio petition to determine if it appears that corn ethanol produced at the facility may achieve the required GHG reductions, if certain conditions are met. This lifecycle analysis, the results of which are explained in this document, involved a straightforward application of the same methodology and modeling used for the final rule published on March 26, 2010 (75 FR 14670) (the “March 2010 RFS rule”), the final rule published on August 2, 2018 (83 FR 37735) (the “August 2018 Sorghum Oil rule”) and the final rule published on February 6, 2020 (85 FR 7016) (the “February 2020 RVO rule”). The difference between this analysis and the corn ethanol analyses completed for the March 2010 RFS rule was the evaluation of a more efficient fuel production process, in terms of the amount of feedstocks and amount/type of energy used to produce a certain quantity of corn ethanol. The other difference is that the Verbio Nevada Corn Process produces biomethane as a co-product instead of distillers grains and solubles (DGS). As discussed further in Section III.A of this document, we used the methods developed for the August 2018 Sorghum Oil rule and February 2020 RVO rule to evaluate the lifecycle GHG emissions of producing ethanol without DGS co-product.

Based on the data provided in the Verbio petition, our analysis found that corn ethanol produced through the Verbio Nevada Corn Process may qualify as renewable fuel if Verbio satisfies all of the conditions specified in this document to demonstrate that such ethanol meets the minimum 20% lifecycle GHG reduction requirement of the Clean Air Act (CAA).¹

In this determination, EPA is specifying certain conditions designed to ensure that RINs are only assigned to volumes of corn ethanol produced through the Verbio Nevada Corn Process if the fuel satisfies the corresponding GHG reduction requirements. The EPA is specifying the condition to

¹ Per the definition of advanced biofuel, CAA section 211(o)(1)(B), ethanol derived from corn starch does not qualify as advanced biofuel.

generate renewable fuel (D-code 6) RINs for corn ethanol produced through the Verbio Nevada Corn Process, Verbio must demonstrate that all corn starch ethanol produced during an averaging period (defined as the prior 365 days or the number of days since EPA activated the D-code 6 pathway associated with the Verbio Nevada Corn Process, whichever is less)² meets the 20% GHG reduction requirement. To make these demonstrations, Verbio must keep records on the feedstocks used and the lifecycle GHG emissions associated with all the ethanol produced by Verbio Nevada, based on the monitoring requirements, emissions factors, and lifecycle analysis methodology and other requirements specified in this document.

This document is organized as follows:

- *Section I. Required Information and Criteria for Petition Requests:* This section contains information on the background and purpose of the petition process, the criteria the EPA uses to evaluate the petitions and the information that is required to be provided under the petition process as outlined in 40 CFR 80.1416. This section includes a general discussion of petitions submitted pursuant to 40 CFR 80.1416.
- *Section II. Available Information:* This section contains background information on the petitioner, the information provided in the petition, and how it complies with the petition requirements outlined in Section I.
- *Section III. Analysis and Discussion:* This section describes the lifecycle analysis done for this determination and describes how it was unique compared to analyses performed for previous RFS rules. This section also describes how we have applied the lifecycle results to determine the appropriate D code for fuel produced pursuant to the evaluated pathways.
- *Section IV. Conditions and Associated Regulatory Provisions:* This section describes the conditions and regulatory provisions associated with this petition determination.
- *Section V. Public Participation:* This section describes how this petition is an extension of the analysis done as part of previous actions that underwent a public notice and comment process.
- *Section VI. Conclusion:* This section summarizes our conclusions regarding the petition, including the D codes that the petition may use in generating RINs for fuel produced through the evaluated pathways.

I. Required Information and Criteria for Petition Requests

A. Background and Purpose of Petition Process

² The full definition of the “averaging time period” is specified in section IV of this document.

The RFS program is set out in CAA 211(o). The EPA's regulations implementing this program are published at 40 CFR part 80. The RFS regulations implement the statutory requirements regarding the types of renewable fuels eligible to participate in the RFS program and specify the procedures by which renewable fuel producers, importers of renewable fuel, and other parties allowed to generate RINs under the RFS regulations (collectively defined as "RIN generators" at 40 CFR 80.2) may generate RINs for the qualifying renewable fuels they produce through approved fuel pathways.

Pursuant to § 80.1426(a)(1)(i) of the regulations, RIN generators may only generate RINs to represent renewable fuel if "[t]he fuel qualifies for a D code pursuant to § 80.1426(f), or the EPA has approved a petition for use of a D code pursuant to § 80.1416."

Table 1 to § 80.1426 lists the three critical components of a fuel pathway: (1) fuel type, (2) feedstock, and (3) production process. Each specific combination of the three components, or fuel pathway, is assigned a D code. The EPA may also independently approve additional fuel pathways not currently listed in Table 1 for participation in the RFS program, or a party may petition for the EPA to evaluate a new fuel pathway in accordance with § 80.1416. In addition, renewable fuel producers qualified in accordance with 40 CFR 80.1403(c) and (d) for an exemption from the 20 percent GHG emissions reduction requirement of the CAA for a baseline volume of fuel ("grandfathered fuel") may generate RINs with a D code of 6 pursuant to 40 CFR 80.1426(f)(6) for that baseline volume, assuming all other regulatory requirements are satisfied.³

The petition process under § 80.1416 allows parties to request that the EPA evaluate a new fuel pathway's lifecycle GHG reduction and provide a determination of the D code for which the new pathway may be eligible.

B. Information to be Provided in Petitions

As specified in 40 CFR 80.1416(b)(1), petitions must include all of the following information, as well as appropriate supporting documents such as independent studies, engineering estimates, industry survey data, and reports or other documents supporting any claims:

- The information specified under 40 CFR 1090.805 (Registration of refiners, importers or oxygenate blenders).

³ "Grandfathered fuel" refers to a baseline volume of renewable fuel produced from a facility that commenced construction before December 19, 2007, and which completed construction within 36 months without an 18-month hiatus in construction and is exempt from the minimum 20 percent GHG reduction requirement that applies to general renewable fuel. A baseline volume of ethanol from a facility that commenced construction after December 19, 2007, but prior to December 31, 2009, qualifies for the same exemption if construction is completed within 36 months without an 18-month hiatus in construction and the facility is fired with natural gas, biomass, or any combination thereof. "Baseline volume" is defined in 40 CFR 80.1401.

- A technical justification that includes a description of the renewable fuel, feedstock(s), biointermediate(s), and production process. The justification must include process modeling flow charts.
- A mass balance for the pathway, including feedstocks and biointermediates, fuels produced, co-products, and waste materials production.
- Information on co-products, including their expected use and market value.
- An energy balance for the pathway, including a list of any energy and process heat inputs and outputs used in the pathway, including such sources produced off site or by another entity.
- Any other relevant information, including information pertaining to energy saving technologies or other process improvements.
- The petition must be signed and certified as meeting all the applicable requirements of 40 CFR 80.1416 by the responsible corporate officer of the applicant company.
- Other additional information as requested by the EPA to complete the lifecycle greenhouse gas assessment of the new fuel pathway.

In addition to the requirements stated above, parties who use a feedstock not previously evaluated by the EPA must also include additional information pursuant to 40 CFR 80.1416(b)(2). This information was not required for the Verbio petition because it requests evaluation of pathways that use a feedstock, corn starch, that the EPA previously evaluated in the March 2010 RFS rule.

II. Available Information

A. Background on the Petitioner

Verbio submitted a petition requesting approval for their generation of RINs for ethanol produced by a dry mill process from corn starch feedstock at their Nevada, Iowa facility. A petition is required because the pathway associated with the Verbio Nevada Corn Process is not included in Table 1 to 40 CFR 80.1426 and has not otherwise been approved by EPA. Table 1 (relevant portions of which are reproduced below) includes pathways for ethanol from corn starch through a dry mill process that coproduces ethanol and DGS. The Verbio Nevada Corn Process does not match any of the pathways in Table 1 to 40 CFR 80.1426 because it produces biomethane as a co-product instead of DGS. Furthermore, the Verbio Nevada facility does not have any “grandfathered” baseline volume pursuant to 40 CFR 80.1403.

Table 1: Relevant Existing Fuel Pathways from 40 CFR 80.1426

Row	Fuel Type	Feedstock	Production Process Requirements	D Code
A	Ethanol	Corn Starch	All of the following: Dry mill process, using natural gas, biomass, or biogas for process energy and at least two advanced technologies from Table 2 to this section	6 (Renewable Fuel)
B	Ethanol	Corn Starch	All of the following: Dry mill process, using natural gas, biomass, or biogas for process energy and at least one of the advanced technologies from Table 2 to this section plus drying no more than 65% of the distillers grains with solubles it markets annually	6 (Renewable Fuel)
C	Ethanol	Corn Starch	All of the following: Dry mill process, using natural gas, biomass, or biogas for process energy and drying no more than 50% of the distillers grains with solubles it markets annually	6 (Renewable Fuel)

B. Information Submitted as Part of the Verbio Petition

Verbio provided all of the required information in the petition, including all of the data needed for the EPA to perform a threshold determination of the potential for corn ethanol produced through the Verbio Nevada Corn Process to satisfy the 20% lifecycle GHG reduction requirement applicable to non-grandfathered renewable fuel if all conditions in this document are satisfied. These data included projected mass and energy balance data for the Verbio Nevada Corn Process.

C. Information Available Through Existing Modeling

For the pathway addressed in its petition, Verbio would use a feedstock (corn starch) that has already been analyzed as part of the March 2010 RFS rule and the August 2018 sorghum oil rule. For the March 2010 RFS rule, we modeled the GHG emissions associated with corn used for ethanol including the effects of using the DGS co-product as livestock feed. For the August 2018 sorghum oil rule, we modified this modeling to estimate the GHG emissions associated with using corn without DGS co-product. As a result, no new feedstock modeling was required to evaluate the Verbio petition, as modeling for corn starch was already done as part of previous rules.

No new emissions impact modeling of using ethanol as a transportation fuel was required, as that was already done as part of the March 2010 RFS rule. This petition only requires EPA to evaluate a modified fuel production process for an existing fuel type.

The same analytical approach that was used to evaluate the lifecycle GHG emissions of the existing corn ethanol pathways noted above was used to analyze the pathway described in the Verbio petition. The preamble to the March 2010 RFS rule describes the modeling approach used to estimate lifecycle GHG emissions from corn ethanol. To modify the corn analysis to reflect the process described in the Verbio petition, we made straightforward data updates as described below, and modeled the specific production process data provided by Verbio for the Verbio Nevada facility. This resulted in the following changes to our existing corn starch ethanol modeling (described in more detail in the following sections):

- Upstream modeling adjusted to estimate the GHG emissions associated with corn used for ethanol production without DGS production, using the methodology developed for the August 2018 sorghum oil rule.
- Straightforward data updates to consider more recent emissions factor data from the GREET model, including updating global warming potential values from the IPCC Second Assessment Report to values from the Fifth Assessment Report.⁴
- Amount of corn used in the fuel production process was modified to reflect the Verbio Nevada process yield in terms of bushels of feedstock input per gallon of ethanol produced; and
- Amount of energy used by the fuel production process was changed to reflect data provided in the Verbio Nevada energy balance.

⁴ IPCC, 2014: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland, 151 pp.

This was a straightforward analysis based on existing modeling done for the March 2010 RFS rule and the August 2018 sorghum oil rule and substituting the Verbio Nevada process data, which only altered the amounts of certain inputs and outputs of the fuel production process.

III. Analysis and Discussion

A. Lifecycle Analysis

Determining a fuel pathway's compliance with the lifecycle GHG reduction thresholds specified in the CAA for different types of renewable fuel requires a comprehensive evaluation of the renewable fuel, as compared to the gasoline or diesel fuel that it replaces, on the basis of its lifecycle GHG emissions. As mandated by the CAA, the GHG emissions assessments must evaluate the aggregate quantity of GHG emissions (including direct emissions and significant indirect emissions such as significant emissions from land use changes) related to the fuel's full lifecycle, including all stages of fuel and feedstock production, distribution, and use by the ultimate consumer.

In examining the full lifecycle GHG impacts of renewable fuels for the RFS program, EPA considers the following:

- Feedstock production – based on agricultural sector models that include direct and indirect impacts of feedstock production.
- Fuel production – including process energy requirements, impacts of any raw materials used in the process, and benefits from co-products produced.
- Fuel and feedstock distribution – including impacts of transporting feedstock from production to use, and transport of the final fuel to the consumer.
- Use of the fuel – including combustion emissions from use of the fuel in a vehicle.

EPA's evaluation of the lifecycle GHG emissions for the pathway described in the Verbio petition is consistent with the CAA's applicable requirements, including the definition of lifecycle GHG emissions and threshold evaluation requirements. It was based on information provided in the petition, including mass and energy balance data for the pathways associated with the Verbio Nevada Corn Process.

Feedstock production and transport (upstream emissions) – Verbio uses corn as the feedstock to produce ethanol. Our agricultural sector modeling for the March 2010 RFS rule to estimate the land use change, crop production and livestock GHG emissions associated with corn used for ethanol includes the effects of using the DGS co-product as livestock feed. For the Verbio

Nevada Process, we needed to estimate the GHG impacts of using corn to produce ethanol without indirect emissions impacts of using the DGS co-product as livestock feed.⁵ are 9.7 kgCO₂e per lb. of corn of used for ethanol, and 16.0 kg CO₂e per bushel of corn used for livestock feed (i.e., corn without DGS co-product fed to livestock).⁶a more recent version of the GREET model.

For the March 2010 RFS rules, we used The Forest and Agricultural Sector Optimization Model (FASOM) and Food and Agricultural Policy Research Institute (FAPRI) models to estimate the GHG impacts of increasing the usage of corn for ethanol production. For our evaluation of the Verbio petition we made straightforward updates to our original estimate of the upstream GHG emissions associated with corn starch production and transport. These updates did not involve any revisions to the agricultural sector (FASOM or FAPRI) modeling conducted for the March 2010 RFS2 rule. First, in places where the original analysis used data from a prior version of the GREET model, we replaced these data with the default estimates, without modification, from the GREET-2022 Fuel Cycle Model.⁷ The GREET data updates were applied to the following elements: emissions factors for natural gas production and use, LPG production and use, coal production and use, nitrogen fertilizer production, phosphate fertilizer production, hydrogen production, herbicide and pesticide production and use, and feedstock transport energy use and emissions. Second, we updated the foreign land use change emissions factors based on more recent data on forest carbon stocks in Latin America, Sub-Saharan Africa, other parts of Africa, and Europe. We have used and documented these data updates in prior rules and Federal Register publications.⁸ Third, we updated our estimates of the GHG emissions

⁵ See docket memo, “Summary for the Final Rule of Key Assumptions for EPA’s Analysis of the Lifecycle Greenhouse Gas Emissions Associated with Biofuels Produced from Distillers Sorghum Oil.” July 20, 2018. Document number: EPA-HQ-OAR-2017-0655-0092

⁶ For the August 2018 sorghum oil rule our estimate was 14.9 kgCO₂e per bushel of corn used for livestock feed. For this analysis we removed an estimated reduction in enteric methane emissions associated with feeding DGS to cows. This change does not affect our conclusions for the August 2018 sorghum oil rule or the February 2020 RVO rule (85 FR 7016) regarding which fuels produced from distillers sorghum and corn oil qualify for the 50% GHG reduction threshold (i.e., all of the pathways evaluated continue to satisfy the 50% GHG reduction threshold).

⁷ Wang, Michael, Elgowainy, Amgad, Lee, Uisung, Baek, Kwang H., Bafana, Adarsh, Benavides, Pahola T., Burnham, Andrew, Cai, Hao, Cappello, Vincenzo, Chen, Peter, Gan, Yu, Gracida-Alvarez, Ulises R., Hawkins, Troy R., Iyer, Rakesh K., Kelly, Jarod C., Kim, Taemin, Kumar, Shishir, Kwon, Hoyoung, Lee, Kyuha, Liu, Xinyu, Lu, Zifeng, Masum, Farhad, Ng, Clarence, Ou, Longwen, Reddi, Krishna, Siddique, Nazib, Sun, Pingping, Vyawahare, Pradeep, Xu, Hui, and Zaimes, George. *Greenhouse gases, Regulated Emissions, and Energy use in Technologies Model*® (2022 Excel). Computer Software. USDOE Office of Energy Efficiency and Renewable Energy (EERE). 10 Oct. 2022. Web. doi:10.11578/GREET-Excel-2022/dc.20220908.1.

⁸ These updates are described in the following technical report available in a public docket: Harris, N.L. 2011. Revisions to Land Conversion Emission Factors since the RFS2 Final Rule. Report submitted to EPA. EPA-HQ-OAR-2011-0542-0058.

associated with changes in foreign on-farm energy use.⁹ Finally, we updated from using global warming potential values from the IPCC Second Assessment Report to values from the Fifth Assessment Report. With these updates, our estimate for corn used for ethanol changes from 9.7 to 10.1 kgCO₂e per bushel to and our estimate for corn used for ethanol without DGS co-product fed to livestock changes from 16.0 to 16.3 kgCO₂e per bushel.

We estimated the total unallocated GHG emissions associated with the corn used by the Verbio Nevada Process as the product of 16.3 kgCO₂e per bushel and the bushels of corn used by the Verbio Nevada facility for one day, based on data provided in the Verbio petition. As discussed below, the feedstock production emissions allocated to the ethanol vary depending on the applied co-product allocation approach. Our primary co-product allocation method for this facility-specific determination involves the use of energy allocation whereby we allocate the corn production emissions between the outputs from the ethanol production unit process based on the energy content of the ethanol and DGS co-products. Although the DGS produced at the Verbio Nevada facility are not sold as livestock feed, it is used as an input to produce biomethane, fertilizer and soil amendment co-products which are sold for productive use. Following this approach, we report the resulting estimate of 47 kgCO₂e per mmBtu of ethanol as the “Feedstock Production” emissions in Table 2, below.

Fuel production (process emissions) – The Verbio Nevada Process is a dry mill ethanol production process. To analyze the GHG impacts of the corn ethanol production process used by Verbio Nevada, we utilized the same approach that we used to determine the impacts of processes in the corn ethanol pathways analyzed in the March 2010 RFS rule, taking into account differences in the types and amounts of process energy used and resulting co-products.

Verbio submitted average daily mass and energy balance data for operations at Verbio Nevada, including all of the process energy used from the point of delivery of the feedstock through feedstock processing, and fuel and co-product production, to the point of final storage of the end product fuel and co-products at the fuel production facility. This includes the energy used to produce all of the ethanol produced by Verbio Nevada.

They have been applied in the following actions: January 2012 Palm Oil NODA (77 FR 4300), December 2012 grain sorghum rule (77 FR 74592), October 2015 Jatropha Oil Notice (80 FR 61406), July 2015 Sugar Beets Notice (82 FR 34656), April 2022 Canola Oil Pathways NPRM (87 FR 22823).

⁹ These updates are explained in the April 2022 Canola Oil Pathways NPRM (87 FR 22834-22835). Data and estimates are available on the docket: “Canola RD Intl Ag Energy GHG NPRM v2” (EPA-HQ-OAR-2021-0845-0014).

The Verbio petition includes mass and energy balance data for three separate unit processes: 1) ethanol production via dry mill fermentation, 2) biogas production via anaerobic digestion, and 3) biomethane production. As discussed below, the quantity of fuel production emissions attributed to the ethanol depends on the applied co-product allocation approach. For this facility-specific petition determination, our primary approach is to allocate all of the emissions associated with natural gas and electricity use by the ethanol production unit process to the ethanol (not to the DGS co-product). This is the primary approach for this facility-specific evaluation as this natural gas and electricity consumption is for the purpose of making ethanol. This approach is consistent with our analytical approach for the August 2018 sorghum oil rule whereby we did not allocate energy consumption from the ethanol production unit process to the DGS or corn oil co-products. Below, we discuss how other allocation approaches would affect our lifecycle GHG estimates.

To evaluate the GHG emissions associated with Verbio Nevada's electricity and natural gas consumption we use lifecycle GHG emissions factors used for process energy from the GREET-2022 model. Specifically, for natural gas we use an emissions factor of 7.34×10^{-5} kgCO₂e per Btu and for U.S. average grid electricity we use 0.467 kgCO₂e per kWh. Based on the data in the Verbio petition, we report the resulting estimate of 17 kgCO₂e per mmBtu of ethanol as the "Ethanol Production" emissions in Table 2, below.

Fuel distribution and use (downstream emissions) – The fuel type, ethanol, and hence the fuel distribution and use for ethanol, was already considered as part of the March 2010 RFS rule. The updated emissions factor, based on data from GREET-2022, for ethanol distribution and use, otherwise known as downstream emissions, is 1.4 kgCO₂e per mmBtu of ethanol. We applied this emissions factor for corn ethanol to our analysis of the Verbio petition.

Lifecycle GHG emissions – The lifecycle GHG emissions associated with Verbio Nevada's fuel were then compared to the baseline lifecycle GHG emissions, using the GHG estimates for baseline gasoline as in the March 2010 RFS rule analysis, but with the global warming potentials updated from the values from the IPCC Second Assessment Report to values from the Fifth Assessment Report. Based on the data submitted by Verbio, our analysis indicates that corn starch ethanol produced using the Verbio Nevada Corn Process would result in at least a 20 percent GHG emissions reduction compared to the baseline lifecycle GHG emissions.

Table 2 below breaks down by stage the lifecycle GHG emissions for corn ethanol produced using the Verbio Nevada Corn Process, compared to such emissions for the average 2005 gasoline baseline. This table demonstrates the contribution of each stage in the fuel pathway and its relative significance in terms of GHG emissions.

In the table, upstream emissions include the GHG emissions associated with producing the corn feedstock and transporting it to the fuel production facility. Process emissions include the GHG emissions associated with the corn ethanol production process. Downstream emissions include the GHG emissions associated with distributing and using the finished fuel. Table 2 provides EPA’s mean estimate of GHG emissions for each of these stages of the lifecycle.

Table 2: Lifecycle GHG Emissions for Corn Starch Ethanol Produced through the Verbio Nevada Corn Process (kgCO₂e/mmBtu)¹⁰

	Corn Ethanol Produced Through the Verbio Nevada Corn Process	Baseline Lifecycle GHG Emissions for Gasoline
Feedstock Production	47	9
Fuel Production	17	10
Fuel Distribution and Use	1	80
Lifecycle Emissions	65	99
Percent Reduction	34%	--

* Emissions included in Fuel Production stage.

Co-Product Accounting Methods – As discussed above, our lifecycle GHG estimates for corn ethanol produced through the Verbio Nevada Process depend on the co-product allocation method applied. Although our evaluation of this facility-specific pathway relies on methods and modeling developed through previous RFS rulemakings, there are unique aspects of this facility-specific process with implications for co-product accounting. In our evaluation of this petition, we evaluated the effects of multiple co-product allocation approaches, and we discuss the findings here.

As discussed above, our primary co-product accounting approach for the Verbio Nevada Process is energy allocation at the unit process level with all of the electricity and natural gas used by the ethanol production unit process allocated to the ethanol. With this approach, we estimate the corn ethanol produced through the Verbio Nevada Process reduces lifecycle GHG emissions by 34 percent relative to the petroleum baseline (See Table 2).

¹⁰ Net emissions may not be the sum of the rows due to rounding.

If we use unit-process level energy allocation and allocate the ethanol production electricity and natural gas use by the ethanol production unit process to the ethanol and DGS (instead of allocating these emissions entirely to the ethanol),¹¹ we would estimate that the corn ethanol produced through the Verbio Nevada Process reduces lifecycle GHG emissions by 40 percent relative to the petroleum baseline. The estimated GHG reduction for ethanol is larger with this approach because more of the GHG emissions are allocated to the DGS and resulting co-products instead of the ethanol.

The Verbio Nevada Process consumes natural gas for process energy and also produces biomethane which can be sold as natural gas. If we use our primary approach, but only consider the natural gas consumption net of biomethane output, the estimate for corn ethanol would be a 39% GHG reduction relative to the petroleum baseline. This approach yields a larger GHG reduction than our primary approach because it attributes the benefit of biomethane displacing natural gas use to the ethanol.

If we use a system level energy allocation approach (as opposed to the unit process level approach) where we consider the entire Verbio Nevada Process one unit process and allocate emissions based on all of the inputs and outputs to this system, the estimate for corn ethanol would be a 30 percent GHG reduction relative to the petroleum baseline.

Finally, we also considered a displacement approach whereby each co-product is assumed to displace an incumbent product in the market on a one-to-one basis. With this approach, we assume the distillers corn oil co-product displaces other distillers corn oil, the fertilizer co-product displaces conventional fertilizer and the biomethane displaces conventional natural gas. If we use this approach, the estimate for corn ethanol would be a 38 percent GHG reduction relative to the petroleum baseline.

In summary, while we used one co-product allocation approach for our primary estimate for the reasons discussed above, we also considered four alternative co-product accounting methods. In every case, we estimate that the corn ethanol would satisfy the 20% GHG reduction threshold. This increases our confidence in the appropriateness of our determination that, based on the data provided in the Verbio petition, corn ethanol produced through the Verbio Nevada Process satisfies

¹¹ In this instance, the DGS include the distillers corn oil, i.e., it is the amount of DGS prior to oil extraction.

the 20 percent GHG reduction threshold.¹² This finding is contingent upon the data provided in the Verbio petition, including the assumptions that the distillers corn oil, fertilizer, soil amendment and biomethane co-products are all sold for productive uses.

B. Application of the Criteria for Petition Approval

Based on the information provided in the Verbio petition, and the requirements specified in section IV which limit RIN generation for corn ethanol to fuel for which ongoing monitoring and assessment allows documentation of compliance with appropriate lifecycle greenhouse gas reduction requirements, EPA is approving this petition request. Specifically, we have determined that ethanol produced pursuant to the Verbio Nevada Corn Process using corn starch feedstock satisfies the minimum 20% greenhouse gas reduction threshold required in the CAA for non-grandfathered renewable fuel if the ethanol is produced in accordance with the fuel yield and energy use information specified in the Verbio petition. As detailed in section IV, the EPA is specifying certain conditions that must be satisfied for ethanol produced through the approved pathway to be eligible for RIN generation. Where all the conditions are satisfied, the EPA is authorizing the generation of renewable fuel (D-code 6) RINs for ethanol produced through the Verbio Nevada Corn Process from corn starch, provided that the fuel meets the other criteria for renewable fuel specified in the CAA and the EPA's implementing regulations.

IV. Conditions and Associated Regulatory Provisions

The EPA's approval of a pathway for corn starch ethanol produced through the Nevada Corn Process is predicated on the circumstances and analysis described in this document. To ensure that renewable fuel produced through this fuel pathway is produced in a manner consistent with those circumstances and analysis, we are prescribing certain conditions as described below. The authority for Verbio to generate RINs for corn starch ethanol produced pursuant to the Verbio Nevada Corn Process is expressly conditioned on Verbio satisfying all of the following conditions as detailed in this section, in addition to other applicable requirements for renewable fuel and renewable fuel producers set forth in the RFS regulations.

¹² Although we are not making a determination in this document on whether the biomethane produced through the Verbio Nevada Process qualifies for D-code 6 RINs, we note that with the unit process energy allocation approaches the biomethane produced through the Verbio Nevada Process would not satisfy the 20 percent GHG reduction threshold. However, if we use the system level energy allocation approach or the displacement approach the biomethane could potentially satisfy the GHG reduction requirement.

The conditions in this section are enforceable under the CAA. They are established pursuant to the informal adjudication reflected in this decision document, and also pursuant to any regulations cited below and 40 CFR 80.1426(a)(1)(iii), 40 CFR 80.1416(b)(1)(vii), 80.1450(i), and 80.1451(b)(1)(ii)(W). In addition or in the alternative to bringing an enforcement action under the CAA, the EPA may revoke this pathway approval if it determines that Verbio has failed to comply with any of the conditions specified herein. The EPA has authority to bring an action to enforce these conditions under 40 CFR 80.1460(a), which prohibits producing or importing a renewable fuel without complying with the RIN generation and assignment requirements. These conditions are also enforceable under 40 CFR 80.1460(b)(2), which prohibits creating a RIN that is invalid; a RIN is invalid if it was improperly generated. Additionally, pursuant to 40 CFR 80.1460(b)(7), generating a RIN for fuel that fails to meet all of the conditions set forth in this petition determination is a prohibited act. In other words, unless all of the conditions specified in this section are satisfied, renewable fuel cannot be validly produced through the pathways approved in this document.

This section details the registration, compliance monitoring, lifecycle GHG computation, recordkeeping, reporting, attest engagement and other requirements that apply to the corn ethanol pathway associated with the Verbio Nevada Corn Process and it is organized as follows:

- *Sub-section A*: definitions
- *Sub-section B*: registration requirements
- *Sub-section C*: compliance monitoring
- *Sub-section D*: lifecycle GHG conditions and associated computational requirements
- *Sub-section E*: recordkeeping requirements
- *Sub-section F*: reporting requirements
- *Sub-section G*: additional requirements

As described in the following sections, one condition for Verbio to generate RINs for corn starch ethanol produced through the Verbio Nevada Corn Process during a specified averaging period (typically 365 days) is documentation by Verbio that RINs are only generated if, on average, all corn starch ethanol produced during the specified averaging period satisfies the 20% lifecycle GHG reduction requirement. The 365-day (or shorter in certain circumstances) rolling average is calculated based on the daily data monitored and collected by Verbio and the formula specified in section IV.D.

A. Definitions

For the purposes of this petition approval, the following terms are defined as follows:

- a. *365-day rolling average lifecycle GHG emissions* means the average lifecycle GHG emissions for the corn starch ethanol produced through the Verbio Nevada Corn Process

during the averaging time period, calculated as specified in section IV.D. based on the daily data collected and recorded by Verbio through continuous monitoring.¹³

- b. *Averaging time period* means the 365 calendar days prior to the day that Verbio wishes to generate RINs for corn starch ethanol produced during the averaging period through the Verbio Nevada Corn Process, or the number of days prior to the day that Verbio wishes to generate RINs since EPA activated the pathway,¹⁴ whichever is less. To clarify, Verbio may not generate RINs for corn starch ethanol produced through the Verbio Nevada Corn Process on the same day that the ethanol is produced.
- c. *Continuous monitoring* means the collection and use of measurement data and other information to record the data inputs required to calculate the 365-day rolling average lifecycle GHG emissions, in accordance with the compliance monitoring plan described in section IV.C.
- d. *Energy used for feedstock, fuel and co-product operations* means energy used in all buildings or other areas that are used in any part for the storage and/or processing of feedstock corn and the production and/or storage of ethanol. For the Verbio Nevada Corn Process, this includes electricity and natural gas used for ethanol production, storage and handling. It also includes electricity and natural gas used for distillers grains production, storage and handling prior to the insertion of this material into one of the anaerobic digesters at the Verbio Nevada Facility. For the Verbio Nevada Corn Process, energy used for biogas and RNG production are not part of the “energy used for feedstock, fuel and co-product operations.”
- e. *Period of missing data* includes each day for which Verbio does not have valid data collected through continuous monitoring for any of the daily data inputs required to calculate the 365-day rolling average lifecycle GHG emissions, as specified section IV.D.

B. Registration

¹³ The EPA has provided Verbio with a spreadsheet to help Verbio perform the correct calculation of 365-day rolling average lifecycle GHG emissions.

¹⁴ A fuel pathway is activated under the RFS program when EPA accepts the registration application for the pathway, allowing it to be used in EMTS for RIN generation. When EPA accepts a registration application, an email is automatically sent from otaqfuels@epa.gov to the responsible corporate officer (RCO) of the company that submitted the registration application. The subject line of such an email includes the name of the company and the company request (CR) number corresponding with the registration application submission, and the body of the email says the company request “has been activated.”

Verbio Nevada must comply with all registration provisions in 40 CFR Part 80 that apply to renewable fuel producers to register for the production of non-grandfathered corn ethanol through the Verbio Nevada Corn Process. The description of the Verbio Nevada production process that is required for registration pursuant to 40 CFR 80.1450(b)(1)(ii) must contain the following:¹⁵

- a. A Compliance Monitoring Plan including technical specifications detailing how Verbio will accurately and reliably measure and record all of the daily data required in section IV.D. and calculate and record the 365-day rolling average lifecycle GHG emissions.
- b. A process flow diagram showing all of the following:
 1. The supply and continuous monitoring of all energy used for feedstock, fuel and co-product operations.
 2. The continuous monitoring of bushels of corn used in fuel production processes for all of the ethanol produced by Verbio Nevada, including ethanol for which RINs are not generated.
 3. The continuous monitoring of volume and temperature¹⁶ for all of the ethanol produced by Verbio Nevada, including ethanol for which RINs are not generated.
 4. The continuous monitoring of the output of distillers grains and solubles, also known as deoiled syrup, thin stillage and wet cake, from the ethanol production operations at the Verbio Nevada Facility.
 5. Information for each of the continuous monitoring systems (e.g., scales, fuel flow meters and electricity meters) shown in the process flow diagram, including the name of the manufacturer, the manufacture date and all relevant serial numbers.
- c. A certification signed by a Responsible Corporate Officer containing the following statement: "I hereby certify that: (1) I have reviewed and understand the process flow diagram submitted with this application for registration as required pursuant to section IV.B.b of the petition approval document for the pathway associated with the Verbio Nevada Corn Process; (2) To the best of my knowledge the process flow diagram is accurate and complete; (3) All monitoring devices specified in the process flow diagram will be calibrated and maintained according to the manufacturer specifications or more frequently (if the manufacturer does not provide calibration or maintenance records then the company must meet standards for similar monitoring devices); and (4) All of the

¹⁵ All of the registration materials required by 80.1450(b)(1), including those specifically described in this document, must be reviewed and verified pursuant to the independent third party engineering review required under 80.1450(b)(2).

¹⁶ Temperature readings must take place at the same time the volume is measured.

monitoring devices included in the process flow diagram monitor all of the information specified in sections IV.B.b.1, 2 and 3 of the petition approval document for the pathway associated with the Verbio Nevada Corn Process.”

- D. If Verbio wishes to exclude any amount of energy used at Verbio Nevada when calculating the 365-day rolling average lifecycle GHG emissions, the description of the facility’s production process must include all of the following:
1. An explanation of why such energy should not be included.
 2. A plan showing how the energy that will not be included in the calculation of the 365-day rolling average lifecycle GHG emissions will be kept completely segregated, separately metered and recorded.¹⁷
- e. If Verbio wishes to take credit for exported electricity in calculating GHG_{PC} pursuant to section IV.D, Verbio must include a certification signed by a Responsible Corporate Officer stating that any exported electricity would be the result of combined heat and power technology as defined in the RFS regulations at 40 CFR 80.2.

C. Compliance Monitoring

Verbio must implement the Compliance Monitoring Plan and must use data obtained and recorded in accordance with this plan to calculate the 365-day rolling average lifecycle GHG emissions.

D. Corn Ethanol Lifecycle GHG Emissions

Verbio may not generate RINs for corn starch ethanol produced pursuant to the Verbio Nevada Corn Process unless it can demonstrate, through records produced in accordance with 40 CFR 80.1454(b)(3) that are available as of the date of RIN generation and maintained by Verbio for a

¹⁷ There are only two valid reasons for excluding any amount of energy used by Verbio Nevada when calculating the 365-day rolling average lifecycle GHG emissions. The first is that the energy is used in a stand-alone and separately metered building that is used solely for administrative or other purposes that are not directly related to the feedstock, fuel and co-product operations. The second is that the energy is used in a stand-alone and separately metered tower grain dryer to dry the corn kernel feedstock prior to grinding. The lifecycle GHG emissions from energy used at such a tower grain dryer may be excluded because they have been taken into account as part of the feedstock production stage of the EPA’s lifecycle assessment of corn starch ethanol as modeled for the March 2010 RFS rule.

minimum of five years from the date of RIN generation, that it has satisfied all of the following requirements:

- a. All of the ethanol produced at Verbio Nevada was produced by a dry mill process using only corn starch, or a combination of corn starch and corn kernel fiber as feedstocks during the averaging time period.
- b. The 365-day rolling average lifecycle GHG emissions are calculated using the following formula, and do not exceed 79.17 kgCO₂e/mmBtu of corn ethanol:¹⁸

$$LC_{GHGc} = GHG_{Uc} + GHG_{Pc} + GHG_D$$

Where:

LC_{GHGc} = Lifecycle GHG emissions, in kgCO₂e/mmBtu, of the volume of all corn starch ethanol produced at the facility during the averaging time period.

GHG_{Uc} = Upstream GHG emissions, in kgCO₂e/mmBtu, related to the production and transport of the volume of corn starch feedstock used to produce all corn starch ethanol produced at the facility during the averaging time period, calculated per section IV.D.c.

GHG_{Pc} = Process GHG emissions, in kgCO₂e/mmBtu, related to the processes used for conversion of corn into ethanol during the averaging period, including energy used for feedstock, fuel and co-product operations; calculated per section IV.D.d.¹⁹

GHG_D = Downstream GHG emissions, in kgCO₂e/mmBtu, related to the distribution and use of all corn ethanol produced during the averaging period, calculated per section IV.D.e.

- c. For the purposes of the formula in section IV.D.b, GHG_{Uc} is calculated according to the following formula:

$$GHG_{Uc} = \frac{16.26 * B_C}{(V_{CSS} * 0.076 + DGS * 0.0192 + DCO * 0.0353)}$$

Where:

¹⁸ As discussed in section II of this document, the statutory petroleum gasoline baseline is 99.0 kgCO₂e/mmBtu. Fuel meeting the twenty percent lifecycle GHG reduction threshold produces 79.17 kgCO₂e/mmBtu or less.

¹⁹ See the definition of “energy used for feedstock, fuel and co-product operations.”

16.26 = Upstream emissions factor for corn, in kgCO₂e per bushel, based on the lifecycle GHG modeling done by the EPA as described above in section III.A.

B_C = Bushels of corn used by Verbio Nevada as feedstock to produce ethanol during the averaging time period in terms of a standard bushel at 15.5% moisture.

For the purposes of this paragraph, B_C, must be calculated according to the following formula:

$$B_C = B_{C_m} * \left(\frac{1 - m_c}{1 - 0.155} \right)$$

B_{Cm} = Bushels of corn used by Verbio Nevada as feedstock to produce ethanol during the averaging time period based on measurements recorded by Verbio Nevada.

M_c = Average moisture content of corn, in mass percent, for the corn delivered to Verbio Nevada for use as feedstock to produce ethanol during the averaging time period. The moisture content tests performed by Verbio must sample corn that, based on good engineering judgment, is representative of each delivery of corn feedstock to Verbio Nevada. Verbio must test the moisture content of the corn delivered in each and every truck load, train load, or other delivery of corn to Verbio Nevada, and for any given delivery must measure the corn moisture content no less frequently than once for every 10,000 bushels. The moisture content must be measured at the same time that the corn is weighed to determine B_{Cm}. For moisture content, Verbio must use a DICKEY-john GAC 2500UGMA or Perten AM 5200-A moisture meter, as certified by the National Type Evaluation Program, and follow the device's operating instructions, or use alternative test methods as specified by Verbio in their Compliance Monitoring Plan accepted by EPA. Verbio must calculate the average moisture content as a weighted average, by summing the products of the mass and corresponding moisture content of each corn delivery, and then dividing by the total mass of corn feedstock delivered to Verbio Nevada during the averaging time period.

0.155 = Moisture content of a standard bushel of corn at 56 pounds per bushel.

V_{CSS} = V_S - V_{CFS}, the standardized volume of corn starch ethanol produced during the averaging time period, in gallons of undenatured ethanol.

V_S = Standardized volume of all ethanol produced at the Verbio Nevada facility during the averaging time period, in gallons of undenatured ethanol. In determining the standardized volume, the actual volumes of ethanol must be adjusted to a standard temperature of 60 degrees Fahrenheit using the following formula:

$$V_S = V_A * \left(1 - \left(0.00114 * \left(\left[\{T + 459.67\} * \frac{5}{9} \right] - \left[\{60 + 459.67\} * \frac{5}{9} \right] \right) \right) \right)$$

Where:

V_A = Actual volume of undenatured ethanol, in gallons.

T = Actual temperature of ethanol, in degrees Fahrenheit, measured at the same time that V_A is measured.

0.00114 = Coefficient to standardize volumes of undenatured ethanol.

60 = Standard temperature, in degrees Fahrenheit, for volumes of ethanol.

459.67 and 5/9 = Conversion factors for Fahrenheit to Kelvin

V_{CFS} = Standardized volume of ethanol produced from corn kernel fiber at the Verbio Nevada facility during the averaging time period, in gallons of undenatured ethanol, determined in accordance with the methods and techniques specified in Verbio's activated registration on file with EPA for the crop residue (i.e., corn kernel fiber) ethanol pathway in row K of Table 1 to 40 CFR 80.1426.

0.076 = Energy content of ethanol, in mmBtu/gallon (lower heating value).

DGS = Kilograms of distillers grains and solubles, on a dry matter basis, inclusive of deoiled syrup, thin stillage and wet cake, produced as a co-product of ethanol production during the averaging time period.

For the purposes of this paragraph, DGS, must be calculated according to the following formula:

$$DGS = DGS_{wet} * (1 - m_{DGS})$$

DGS_{wet} = Kilograms of distillers grains and solubles, on a wet matter basis, inclusive of deoiled syrup, thin stillage and wet cake, produced as a co-product of ethanol production during the averaging time period.

m_{DGS} = Average moisture content of DGS, in mass percent, for the DGS produced as a co-product of ethanol production during the averaging time period. The moisture content tests performed by Verbio must sample DGS that, based on good engineering judgment, is representative of DGS produced through the Verbio Nevada Corn Process. Verbio must test the moisture content of the DGS on a daily basis. If Verbio

demonstrates through records kept in accordance with section IV.E that daily moisture testing is impractical during a particular period of time, the DGS moisture content must be tested no less frequently than once for every one million gallons of ethanol produced. The DGS moisture content tests must test samples of DGS that are representative of the DGS moisture context at the time that the DGS is weighed to determine DGS_{wet} . For moisture content, Verbio must use a DICKEY-john GAC 2500UGMA or Perten AM 5200-A moisture meter, as certified by the National Type Evaluation Program, and follow the device’s operating instructions, or use alternative test methods as specified by Verbio in their Compliance Monitoring Plan accepted by EPA. Verbio must calculate the average moisture content as a weighted average, by summing the products of the mass and corresponding moisture content of each DGS interval (i.e., the amount of DGS produced between moisture samples), and then dividing by the total mass of DGS produced during the averaging time period.

0.192 = The lower heating value of DGS, in mmBtu per kg of dry matter.

DCO = Kilograms of distillers corn oil, on a dry matter basis, produced as a co-product of ethanol production during the averaging time period.

0.0353 = The lower heating value of DCO, in mmBtu per kg of dry matter.

- d. For the purposes of the formula in section IV.D.b, GHG_{PC} is calculated according to the following formula:

$$GHG_{PC} = \frac{GHG_{NG} + GHG_{ELEC}}{V_S * 0.076}$$

Where:

GHG_{NG} = The greenhouse gas emissions, in kgCO₂e, associated with conventional natural gas used for feedstock, fuel and co-product operations, as measured by Verbio by continuous monitoring, and calculated according to the following formula:

$$GHG_{NG} = Btu_{NG} * EF_{NG}$$

Where:

Btu_{NG} = Lower heating value of natural gas, in British thermal units, assuming 983 Btu per standard cubic foot of natural gas.

EF_{NG} = 7.34 * 10⁻⁵ kgCO₂e per Btu of natural gas.

GHG_{ELEC} = The greenhouse gas emissions, in kgCO₂e, associated with electricity used for feedstock, fuel and co-product operations, as measured by Verbio by continuous monitoring, and calculated according to the following formula:

$$GHG_{ELEC} = ELEC * EF_{elec}$$

Where:

ELEC = kWh of Grid electricity used as energy used for feedstock, fuel and co-product operations, as measured by Verbio by continuous monitoring.

EF_{elec} = 0.467 kgCO₂e per kWh of grid electricity, based on the United States grid average.

- e. For the purposes of the formula in section IV.D.b, GHG_D is calculated to be 1.4 kgCO₂e per mmBtu of ethanol.
- f. For the purposes of section IV.D., for all corn ethanol produced by Verbio during a day where Verbio has missing data on any of the factors described in this section, Verbio must assess the corn ethanol produced on all such days as having lifecycle GHG emissions of 99.0 kgCO₂e per mmBtu,²⁰ and use this value in their calculation of the 365-day rolling average lifecycle GHG emissions.

E. Recordkeeping

In addition to the specific recordkeeping requirements stated at 40 CFR 80.1454(b)(3)(i)-(xii), the following records related to the generation and assignment of RINs must be produced and maintained pursuant to 40 CFR 80.1454(b)(3) when Verbio generates RINs for corn ethanol produced through the Verbio Nevada Corn Process.

- a. Records documenting the data required to calculate lifecycle GHG emissions per the requirements specified in section IV.D., and which are collected in accordance with the compliance monitoring plan described in section IV.B.a. This includes comprehensive and reliable information with respect to the amount of feedstock and energy used and the amount of fuel produced, such as meter readings and energy bills that span the entire

²⁰ The value of 99.0 kgCO₂e/mmBtu was selected because it is the value for baseline lifecycle GHG emissions from gasoline, as evaluated by EPA for the March 2010 RFS rule. We recognize this is a conservative approach for substituting missing data, and we believe a conservative approach is necessary to eliminate any incentive for parties to fail to collect and document accurate data.

averaging time period for each instance that RINs are generated for corn ethanol produced through the Verbio Nevada Corn Process.

- b. Records presenting accurate calculations verifying compliance with the requirement specified in section IV.D., above, that the 365-day rolling average lifecycle GHG emissions does not exceed 79.17 kgCO₂e/mmBtu of corn ethanol as calculated in accordance with section IV.D.b, and that are prepared on each day that RINs are generated for corn ethanol produced through the Verbio Nevada Corn Process. The information must include identifiable unique references to all documents and metering data used in the calculations.²¹
- c. Records demonstrating that all of the ethanol, distillers corn oil, biomethane, fertilizer and soil amendment co-products were productively used by Verbio or Verbio sold them to another party for productive use. If the co-products are sold to a third-party, the records must demonstrate that all of the co-products were sold at reasonable market prices (indicating they were purchased by the third party with the intent of productive use) and not subsequently sold back to Verbio.

F. Reporting

As part of the quarterly RIN generation reports required under 40 CFR 80.1451(b), Verbio must submit the workbook file that it used to calculate the 365-day rolling average lifecycle GHG emissions for the prior 365-day period. EPA will provide Verbio with a job aid to assist in submitting the required information to EPA. Verbio must also submit a memorandum summarizing the 365-day rolling average lifecycle GHG emissions and explaining any significant fluctuations in the 365-day rolling average lifecycle GHG emissions or any periods of missing data. Verbio shall report these files to EPA following the standard procedures for RFS quarterly reporting.²²

G. Additional Conditions

The EPA may modify the conditions specified above, as it deems necessary and appropriate to ensure that corn ethanol produced pursuant to the Verbio Nevada Corn Process achieves the required lifecycle GHG reductions, including to make the conditions align with any future changes to the RFS regulations. If the EPA makes any changes to the conditions noted in this document for corn

²¹ The EPA has provided a spreadsheet to Verbio to help Verbio with the correct calculation of 365-day rolling average lifecycle GHG emissions. This spreadsheet can also be used to help with recordkeeping.

²² For more information on how to submit quarterly RFS reports see: <https://www.epa.gov/fuels-registration-reporting-and-compliance-help/how-report-quarterly-and-annually-renewable-fuel>.

ethanol produced pursuant to the Verbio Nevada Corn Process, the Agency will explain such changes in a public determination letter, similar to this one, and specify in that letter the effective date for any such changes.

V. Public Participation

As part of the March 2010 RFS rule, we took public comment on our lifecycle assessment of the corn ethanol pathways listed in Table 1 to 40 CFR 80.1426, including all models used and all modeling inputs and evaluative approaches. In the March 2010 RFS rule, we also acknowledged that it was unlikely that our final regulations would address all possible qualifying fuel production pathways, and we took comment on allowing the generation of RINs using a temporary D code in certain circumstances while the EPA was evaluating such new pathways and updating its regulations. After considering comments, we finalized the current petition process, where we allow for EPA approval of certain petitions without going through additional notice and public comment if we can do so as a reasonably straightforward extension of prior analyses, whereas notice and public comment would be conducted to respond to petitions requiring significant new analysis and/or modeling. *See* 75 FR 14797 (March 26, 2010).

In responding to the petition submitted by Verbio, we have relied on the corn ethanol modeling that we conducted for the March 2010 RFS rule, the August 2018 sorghum oil rule and the February 2020 RVO rule, and have simply adjusted the analysis to account for the specific production process used by Verbio Nevada. We relied on the same agricultural sector modeling (FASOM and FAPRI results) that was conducted and commented on as part of the March 2010 RFS rule to represent feedstock production. This also includes use of the same emission factors, with straightforward data updates, and types of emission sources that were used in the March 2010 RFS rule analysis. Thus, the fundamental analyses relied on for this decision have already been made available for public comment as part of prior RFS rulemakings. Our approach today is also consistent with our description of the petition process in the preamble to the March 2010 RFS rule. Our evaluation in response to the petition is a logical extension of analyses already conducted for the March 2010 RFS rule, the August 2018 sorghum oil rule and the February 2020 RVO rule.

VI. Conclusion

This document specifies conditions designed to ensure that D-code 6 RINs are generated for corn starch ethanol produced pursuant to the Verbio Nevada Corn Process only if the ethanol satisfies the 20% lifecycle GHG reduction requirements specified in the CAA for renewable fuel. The fuel must also meet other applicable requirements specified in the CAA and the EPA's implementing

regulations to qualify for RIN generation, including being produced from renewable biomass, and for use as transportation fuel, heating oil or jet fuel.

This approval applies specifically to the Verbio Nevada facility and to the process, materials used, fuel and co-products produced, and process energy sources as outlined and described in the Verbio petition. This approval is effective as of signature date. However, RINs may only be generated for corn starch ethanol produced pursuant to the Verbio Nevada Corn Process that is produced after the date of activation of Verbio's registration for this pathway.

The OTAQ Reg: Fuels Programs Registration and OTAQEMTS: OTAQ EMTS Application (OTAQ Reg and EMTS) will be modified to allow Verbio to register to generate RINs for the production of ethanol from corn starch feedstock using a production process of "Verbio Nevada Corn Process."