



# How do biointermediates fit into fuel pathways?

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Biointermediates Workshop

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# About this Presentation

- This presentation is being given to assist stakeholders in complying with the regulations regarding biointermediates finalized in the 2020-2022 RVO final rule.
- The presentation is not intended to discuss the merits of the regulatory requirements but rather to assist stakeholders in implementing them.
- To the extent participants provide questions, advice, or materials during or after this meeting, they should do so in their individual capacity.
- This presentation is not intended to supplant the regulatory requirements. Parties must comply with the applicable regulatory requirements regardless of whether and how those requirements are discussed in these presentations.
- The topics in this presentation do not represent future EPA decisions or actions in any particular circumstance and do not bind EPA to any particular decision or action.

# Overview

- This presentation covers the treatment of biointermediates as part of RFS fuel pathways.
  - Biointermediates in existing pathways
  - Biointermediates in new pathways
- What is an RFS pathway?
- Biointermediates and the pathway lookup table (Table 1)
- Lifecycle analysis (LCA) petitions that include biointermediates
- LCA petitions and potential biointermediates

# What is an RFS fuel pathway?

- A fuel pathway is a specific combination of three components:
  - (1) feedstock,
  - (2) production process, and
  - (3) fuel type.
- A lifecycle analysis (LCA) of the fuel pathway's lifecycle greenhouse gas (GHG) emissions is necessary to determine which fuel pathways can qualify.
- All approved pathways are listed on our website
  - Generally applicable pathways are listed in Table 1 to [40 CFR 80.1426](#) of the regulations (“Table 1”).
  - Facility-specific pathways under the 40 CFR 80.1416 LCA petition process.
  - <https://www.epa.gov/renewable-fuel-standard-program/approved-pathways-renewable-fuel>

# Biointermediates and Table 1

- We did not make any changes to Table 1 to 40 CFR 80.1426 as a result of allowing biointermediates to be used under the RFS program.
  - However, we added esterification as a production process in rows F and H of Table 1.
  - We expect this revision to primarily result in D4 RIN generation for biodiesel produced from free-fatty acid (FFA) feedstock through an esterification process.
- Although Table 1 does not explicitly list biointermediates, the regulations now allow for a fuel to be processed at two facilities (a biointermediate production facility and the renewable fuel production facility) under an existing Table 1 pathway.
- This additional flexibility does not change the requirement that to be eligible to generate RINs, fuels must be produced through an approved pathway.
  - That is, the feedstock, production process, and finished fuel produced using a biointermediate must match an approved pathway.

# Table 1 Example

- Crop residue converted to biocrude via catalytic pyrolysis at one facility and then upgraded to renewable gasoline at another facility that uses only natural gas for process energy would be eligible for cellulosic biofuel (D-code 3) RINs through the row M pathway.
- Production process is the same but occurs at two facilities instead of one.

Row	Fuel Type	Feedstock	Production Process Requirements	RIN D-code
M	Renewable Gasoline	Crop residue	Catalytic Pyrolysis and Upgrading...utilizing natural gas, biogas, and/or biomass as the only process energy sources providing that process used converts cellulosic biomass to fuel	3 (cellulosic biofuel)

# LCA petitions for new pathways that include existing biointermediates

- Per 40 CFR 80.1416, LCA Petitions that involve biointermediates will need to include, in addition to other required information, data and information on the following elements:
  - Technical description of the biointermediate, its production process and any co-products
  - Mass and energy balance data for the biointermediate production process, including co-products and their uses
  - Data on biointermediate transportation
- We are updating the resources on our website to provide instructions for how to prepare petitions that involve biointermediates.
  - How to Submit a Complete Petition instruction document
  - Data submission template
  - <https://www.epa.gov/renewable-fuel-standard-program/how-submit-complete-petition-approved-pathway-renewable-fuel>

# Potential biointermediates

- LCA petitions request EPA's evaluation of the lifecycle GHG emissions associated with a new fuel pathway and are **not** a proper means for requesting a new type of biointermediate
  - EPA must revise the RFS regulations to allow new biointermediates into the program
- If a party wants to use a potential biointermediate in a pathway that has not been approved, they will likely need to submit two petitions:
  - Petition for rulemaking requesting new biointermediate (see previous presentation)
  - LCA petition pursuant to 40 CFR 80.1416
- These two reviews can be dual tracked to happen simultaneously