



U.S. Department of Energy

Categorical Exclusion Determination Form

Proposed Action Title:

Program or Field Office:

Location(s) (City/County/State):

Proposed Action Description:

Categorical Exclusion(s) Applied:

For the DOE procedures regarding categorical exclusions, including the full text of each categorical exclusion, see 10 CFR 1021.102 and Appendix B to [10 CFR Part 1021](#), and also Section 5.4 (Applying one or more categorical exclusions to a proposal) and Appendices B and C of [DOE's National Environmental Policy Act Implementing Procedures](#) (June 30, 2025).

Requirements and guidance in 10 CFR 1021.102 and DOE's NEPA Implementing Procedures: (See full text in regulation and in Implementing Procedures)

The proposal fits within a class of actions that is listed in Appendix B to 10 CFR Part 1021 or Appendix B and C of DOE's NEPA Implementing Procedures (June 30, 2025).

To fit within the classes of actions listed in Appendix B to 10 CFR Part 1021, or Appendix B of DOE's NEPA Implementing Procedures, a proposal must satisfy the conditions that are integral elements of the classes of actions in Appendix B of both 10 CFR Part 1021 and DOE's NEPA Implementing Procedures.

There are no extraordinary circumstances related to the proposal that may affect the significance of the environmental effects of the proposal. DOE or an applicant may modify the proposal to avoid reasonably foreseeable adverse significant effects such that the categorical exclusion would apply.

The proposal has not been segmented to meet the definition of a categorical exclusion.

[Note: For proposals that fit within the categorical exclusions listed in Appendix C of DOE's NEPA Implementing Procedures, see DOE's notice of adoption for the subject Appendix C categorical exclusion for additional considerations. DOE notices of adoption for other agency categorical exclusions may be found on [DOE's Section 109 webpage](#).]

Based on my review of the proposed action, as NEPA Compliance Officer, I have determined that the proposed action fits within the specified class(es) of action, the other requirements and guidance set forth above are met, and the proposed action is hereby categorically excluded from further NEPA review.

NEPA Compliance Officer:

Date Determined:

**Attachment A: Projects in the TEOSYNTE (NOFO Nos. DE-FOA-0003405 and DE-FOA-0003408)
Program**

Prime Recipient (Control No.)	Project Title	Categorical Exclusion
Switch Bioworks, Inc. (3408-1503)	Engineering Tunable Ammonia Release In Biofertilizers	B3.6
University of Wisconsin – Madison (3405-1508)	N2Cereals: Delivering Nitrogen to Cereal Crops through Biological Nitrogen Fixation for Sustainable Bioenergy Production	B3.6, B3.1
University of Illinois, Urbana-Champaign (3405-1519)	Redomesticating Maize for More Sustainable Nitrogen Cycling	B3.6, B3.1
University of Tennessee, Knoxville (3405-1543)	SyN-Fix: Synthetic Biology to Improve Nitrogen Cycling in the Maize Rhizosphere	B3.6
Lawrence Berkeley National Laboratory (3405-1505)	Developing Biological Nitrification Inhibitors to Reduce N2O Emissions in Sorghum	B3.6, B3.1
Colorado State University (3405-1545)	Breeding and Mechanisms to Maximize Yield at 45% Current Nitrogen Level	B3.6, B3.1
Texas A&M AgriLife Research (3405-1507)	Developing Field-deployable Low Nitrous Oxide Emission Sorghum Hybrids Using Biological Nitrification Inhibition and Nitrogen Fixation	B3.6, B3.1
Michigan State University (3405-1524)	N-SYNC: Engineering Synchronized Nitrogen Efficiency Traits in Corn Agriculture	B3.6, B3.1
New York University (3405-1553)	TF Regulon Engineering: Reducing N2O Emissions by Increasing NUE in Bioenergy Crops	B3.1, B3.6

Bold text indicates the one project included in the Fourth Amended CX.



U.S. Department of Energy

Categorical Exclusion Determination Form

Proposed Action Title: Technologies to Emend and Obviate SYnthetic Nitrogen's Toll on Emissions -- TEOSYNTE and TEOSYNTE SBIR-STTR (NOFO Nos. DE-FOA-0003405 and DE-FOA-0003408)

Program or Field Office: Advanced Research Projects Agency - Energy

Location(s) (City/County/State): AZ, CA, CO, IL, KS, MI, MO, NC, NY, PA, TN, TX, WI

Proposed Action Description:

THIRD AMENDED PROGRAMMATIC NEPA DETERMINATION (See attached original, First, and Second Amended Determinations, dated August 1, 2025, February 18, 2026, and March 25, 2026 respectively). The Technologies to Emend and Obviate SYnthetic Nitrogen's Toll on Emissions (TEOSYNTE) program supports projects that focus on plant and microbial bio-design strategies that reduce the need to apply synthetic nitrogen fertilizer on corn and sorghum fields while maintaining crop yields. If successful, TEOSYNTE projects would lower costs to farmers by reducing the use of synthetic fertilizer, reduce imports of foreign synthetic nitrogen fertilizer by lowering nitrogen fertilizer use in U.S. agriculture by 27%, lower the demand for natural gas feedstock for fertilizer production, and improve the efficiency of ethanol production from bioenergy crops, thereby increasing U.S. energy security.

The TEOSYNTE Program is composed of 9 small-scale research and development projects that will be conducted by universities, large and small businesses, and national laboratories. This Third Amended Determination adds 1 project to the original, First and Second Amended Determinations (see Attachment A). All 8 projects covered by this Determination fit within the class of actions identified under the DOE Categorical Exclusions identified below. This assessment was based on a review of the proposed scope of work and the potential environmental impacts of each project. All project tasks will be conducted in accordance with established safety and materials/waste management protocols and pursuant to applicable Federal, State, and Local regulatory requirements.

Categorical Exclusion(s) Applied:

B3.6 - Small-scale research and development, laboratory operations, and pilot projects

B3.1 - Site characterization and environmental monitoring

For the DOE procedures regarding categorical exclusions, including the full text of each categorical exclusion, see 10 CFR 1021.102 and Appendix B to [10 CFR Part 1021](#), and also Section 5.4 (Applying one or more categorical exclusions to a proposal) and Appendices B and C of [DOE's National Environmental Policy Act Implementing Procedures](#) (June 30, 2025).

Requirements and guidance in 10 CFR 1021.102 and DOE's NEPA Implementing Procedures: (See full text in regulation and in Implementing Procedures)

- ☒ The proposal fits within a class of actions that is listed in Appendix B to 10 CFR Part 1021 or Appendix B and C of DOE's NEPA Implementing Procedures (June 30, 2025).
To fit within the classes of actions listed in Appendix B to 10 CFR Part 1021, or Appendix B of DOE's NEPA Implementing Procedures, a proposal must satisfy the conditions that are integral elements of the classes of actions in Appendix B of both 10 CFR Part 1021 and DOE's NEPA Implementing Procedures.
- ☒ There are no extraordinary circumstances related to the proposal that may affect the significance of the environmental effects of the proposal. DOE or an applicant may modify the proposal to avoid reasonably foreseeable adverse significant effects such that the categorical exclusion would apply.
- ☒ The proposal has not been segmented to meet the definition of a categorical exclusion.

[Note: For proposals that fit within the categorical exclusions listed in Appendix C of DOE's NEPA Implementing Procedures, see DOE's notice of adoption for the subject Appendix C categorical exclusion for additional considerations. DOE notices of adoption for other agency categorical exclusions may be found on [DOE's Section 109 webpage](#).]

Based on my review of the proposed action, as NEPA Compliance Officer, I have determined that the proposed action fits within the specified class(es) of action, the other requirements and guidance set forth above are met, and the proposed action is hereby categorically excluded from further NEPA review.

NEPA Compliance Officer: **GEOFFREY GOODE**

Digitally signed by GEOFFREY GOODE
Date: 2026.04.17 12:52:08 -04'00'

Date Determined:

**Attachment A: Projects in the TEOSYNTE (NOFO Nos. DE-FOA-0003405 and DE-FOA-0003408)
Program**

Prime Recipient (Control No.)	Project Title	Categorical Exclusion
University of Wisconsin – Madison (3405-1508)	N2Cereals: Delivering Nitrogen to Cereal Crops through Biological Nitrogen Fixation for Sustainable Bioenergy Production	B3.6, B3.1
University of Illinois, Urbana-Champaign (3405-1519)	Redomesticating Maize for More Sustainable Nitrogen Cycling	B3.6, B3.1
University of Tennessee, Knoxville (3405-1543)	SyN-Fix: Synthetic Biology to Improve Nitrogen Cycling in the Maize Rhizosphere	B3.6
Lawrence Berkeley National Laboratory (3405-1505)	Developing Biological Nitrification Inhibitors to Reduce N ₂ O Emissions in Sorghum	B3.6, B3.1
Colorado State University (3405-1545)	Breeding and Mechanisms to Maximize Yield at 45% Current Nitrogen Level	B3.6, B3.1
Texas A&M AgriLife Research (3405-1507)	Developing Field-deployable Low Nitrous Oxide Emission Sorghum Hybrids Using Biological Nitrification Inhibition and Nitrogen Fixation	B3.6, B3.1
Michigan State University (3405-1524)	N-SYNC: Engineering Synchronized Nitrogen Efficiency Traits in Corn Agriculture	B3.6, B3.1
New York University (3405-1553)	TF Regulon Engineering: Reducing N ₂ O Emissions by Increasing NUE in Bioenergy Crops	B3.1, B3.6

Bold text indicates the one project included in the Third Amended CX.



U.S. Department of Energy

Categorical Exclusion Determination Form

Proposed Action Title: Technologies to Emend and Obviate SYnthetic Nitrogen's Toll on Emissions -- TEOSYNTe and TEOSYNTe SBIR-STTR (NOFO Nos. DE-FOA-0003405 and DE-FOA-0003408)

Program or Field Office: Advanced Research Projects Agency - Energy

Location(s) (City/County/State): AZ, CA, CO, IL, KS, MI, MO, NC, NY, PA, TN, TX, WI

Proposed Action Description:

SECOND AMENDED PROGRAMMATIC NEPA DETERMINATION (See attached original and First Amended Determinations, dated August 1, 2025 and February 18, 2026, respectively). The Technologies to Emend and Obviate SYnthetic Nitrogen's Toll on Emissions (TEOSYNTe) program supports projects that focus on plant and microbial bio-design strategies that reduce the need to apply synthetic nitrogen fertilizer on corn and sorghum fields while maintaining crop yields. If successful, TEOSYNTe projects would lower costs to farmers by reducing the use of synthetic fertilizer, reduce imports of foreign synthetic nitrogen fertilizer by lowering nitrogen fertilizer used in U.S. agriculture by 27%, lower the demand for natural gas feedstock for fertilizer production, and improve the efficiency of ethanol production from bioenergy crops, thereby increasing U.S. energy security.

The TEOSYNTe Program is composed of 9 small-scale research and development projects that will be conducted by universities, large and small businesses, and national laboratories. This Second Amended Determination adds 1 project to the original and First Amended Determinations (see Attachment A). All 7 projects covered by this Determination fit within the class of actions identified under the DOE Categorical Exclusions identified below. This assessment was based on a review of the proposed scope of work and the potential environmental impacts of each project. All project tasks will be conducted in accordance with established safety and materials/waste management protocols and pursuant to applicable Federal, State, and Local regulatory requirements. The University of Illinois, Urbana-Champaign has not obtained all necessary permits and approvals for their proposed actions and are prohibited from commencing applicable project work until such permits are obtained. Per the terms of the award, a permit certification and, if necessary, an amended NEPA Determination, is required prior to the conduct of applicable project work.

Categorical Exclusion(s) Applied:

B3.6 - Small-scale research and development, laboratory operations, and pilot projects

B3.1 - Site characterization and environmental monitoring

For the DOE procedures regarding categorical exclusions, including the full text of each categorical exclusion, see 10 CFR 1021.102 and Appendix B to [10 CFR Part 1021](#), and also Section 5.4 (Applying one or more categorical exclusions to a proposal) and Appendices B and C of [DOE's National Environmental Policy Act Implementing Procedures](#) (June 30, 2025).

Requirements and guidance in 10 CFR 1021.102 and DOE's NEPA Implementing Procedures: (See full text in regulation and in Implementing Procedures)

- ☒ The proposal fits within a class of actions that is listed in Appendix B to 10 CFR Part 1021 or Appendix B and C of DOE's NEPA Implementing Procedures (June 30, 2025).
To fit within the classes of actions listed in Appendix B to 10 CFR Part 1021, or Appendix B of DOE's NEPA Implementing Procedures, a proposal must satisfy the conditions that are integral elements of the classes of actions in Appendix B of both 10 CFR Part 1021 and DOE's NEPA Implementing Procedures.
- ☒ There are no extraordinary circumstances related to the proposal that may affect the significance of the environmental effects of the proposal. DOE or an applicant may modify the proposal to avoid reasonably foreseeable adverse significant effects such that the categorical exclusion would apply.
- ☒ The proposal has not been segmented to meet the definition of a categorical exclusion.

[Note: For proposals that fit within the categorical exclusions listed in Appendix C of DOE's NEPA Implementing Procedures, see DOE's notice of adoption for the subject Appendix C categorical exclusion for additional considerations. DOE notices of adoption for other agency categorical exclusions may be found on [DOE's Section 109 webpage](#).]

Based on my review of the proposed action, as NEPA Compliance Officer, I have determined that the proposed action fits within the specified class(es) of action, the other requirements and guidance set forth above are met, and the proposed action is hereby categorically excluded from further NEPA review.

NEPA Compliance Officer: **GEOFFREY GOODE**

Digitally signed by GEOFFREY GOODE
Date: 2026.03.25 14:58:14 -04'00'

Date Determined:

**Attachment A: Projects in the TEOSYNTE (NOFO Nos. DE-FOA-0003405 and DE-FOA-0003408)
Program**

Prime Recipient (Control No.)	Project Title	Categorical Exclusion
University of Illinois, Urbana-Champaign (3405-1519)	Redomesticating Maize for More Sustainable Nitrogen Cycling	B3.6, B3.1
University of Tennessee, Knoxville (3405-1543)	SyN-Fix: Synthetic Biology to Improve Nitrogen Cycling in the Maize Rhizosphere	B3.6
Lawrence Berkeley National Laboratory (3405-1505)	Developing Biological Nitrification Inhibitors to Reduce N2O Emissions in Sorghum	B3.6, B3.1
Colorado State University (3405-1545)	Breeding and Mechanisms to Maximize Yield at 45% Current Nitrogen Level	B3.6, B3.1
Texas A&M AgriLife Research (3405-1507)	Developing Field-deployable Low Nitrous Oxide Emission Sorghum Hybrids Using Biological Nitrification Inhibition and Nitrogen Fixation	B3.6, B3.1
Michigan State University (3405-1524)	N-SYNC: Engineering Synchronized Nitrogen Efficiency Traits in Corn Agriculture	B3.6, B3.1
New York University (3405-1553)	TF Regulon Engineering: Reducing N2O Emissions by Increasing NUE in Bioenergy Crops	B3.1, B3.6

Bold text indicates the one project included in the Second Amended CX.



U.S. Department of Energy

Categorical Exclusion Determination Form

Proposed Action Title: Technologies to Emend and Obviate SYnthetic Nitrogen's Toll on Emissions -- TEOSYNTE and TEOSYNTE SBIR-STTR (NOFO Nos. DE-FOA-0003405 and DE-FOA-0003408)

Program or Field Office: Advanced Research Projects Agency - Energy

Location(s) (City/County/State): CA, CO, IL, KS, MI, MO, NY, PA, TN, TX, WI

Proposed Action Description:

FIRST AMENDED PROGRAMMATIC NEPA DETERMINATION (See attached original Determination, dated August 1, 2025). The Technologies to Emend and Obviate SYnthetic Nitrogen's Toll on Emissions (TEOSYNTE) program supports projects that focus on plant and microbial bio-design strategies that reduce the need to apply synthetic nitrogen fertilizer on corn and sorghum fields while maintaining crop yields. If successful, TEOSYNTE projects would lower costs to farmers by reducing the use of synthetic fertilizer, reduce imports of foreign synthetic nitrogen fertilizer by lowering nitrogen fertilizer used in U.S. agriculture by 27%, lower the demand for natural gas feedstock for fertilizer production, and improve the efficiency of ethanol production from bioenergy crops, thereby increasing U.S. energy security. The TEOSYNTE Program is composed of 9 small-scale research and development projects that will be conducted by universities, large and small businesses, and national laboratories. This First Amended Determination adds 5 projects to the original Determination (see Attachment A). All 6 projects fit within the class of actions identified under the DOE Categorical Exclusions identified below. This assessment was based on a review of the proposed scope of work and the potential environmental impacts of each project. All project tasks will be conducted in accordance with established safety and materials/waste management protocols and pursuant to applicable Federal, State, and Local regulatory requirements. Michigan State University, Lawrence Berkeley National Laboratory, and Texas A&M AgriLife Research have not obtained all necessary permits and approvals applicable to their proposed actions and are prohibited from commencing applicable project work until such permits are obtained. Per the terms of the awards to these entities, permit certifications and, if necessary, amended NEPA Determinations, are required prior to the conduct of applicable project work.

Categorical Exclusion(s) Applied:

B3.6 - Small-scale research and development, laboratory operations, and pilot projects

B3.1 - Site characterization and environmental monitoring

For the DOE procedures regarding categorical exclusions, including the full text of each categorical exclusion, see 10 CFR 1021.102 and Appendix B to [10 CFR Part 1021](#), and also Section 5.4 (Applying one or more categorical exclusions to a proposal) and Appendices B and C of [DOE's National Environmental Policy Act Implementing Procedures](#) (June 30, 2025).

Requirements and guidance in 10 CFR 1021.102 and DOE's NEPA Implementing Procedures: (See full text in regulation and in Implementing Procedures)

- ☒ The proposal fits within a class of actions that is listed in Appendix B to 10 CFR Part 1021 or Appendix B and C of DOE's NEPA Implementing Procedures (June 30, 2025).
To fit within the classes of actions listed in Appendix B to 10 CFR Part 1021, or Appendix B of DOE's NEPA Implementing Procedures, a proposal must satisfy the conditions that are integral elements of the classes of actions in Appendix B of both 10 CFR Part 1021 and DOE's NEPA Implementing Procedures.
- ☒ There are no extraordinary circumstances related to the proposal that may affect the significance of the environmental effects of the proposal. DOE or an applicant may modify the proposal to avoid reasonably foreseeable adverse significant effects such that the categorical exclusion would apply.
- ☒ The proposal has not been segmented to meet the definition of a categorical exclusion.

[Note: For proposals that fit within the categorical exclusions listed in Appendix C of DOE's NEPA Implementing Procedures, see DOE's notice of adoption for the subject Appendix C categorical exclusion for additional considerations. DOE notices of adoption for other agency categorical exclusions may be found on [DOE's Section 109 webpage](#).]

Based on my review of the proposed action, as NEPA Compliance Officer, I have determined that the proposed action fits within the specified class(es) of action, the other requirements and guidance set forth above are met, and the proposed action is hereby categorically excluded from further NEPA review.

NEPA Compliance Officer: **GEOFFREY GOODE**

Digitally signed by GEOFFREY GOODE
Date: 2026.02.18 14:03:08 -05'00'

Date Determined:

**Attachment A: Projects in the TEOSYNTE (NOFO Nos. DE-FOA-0003405 and DE-FOA-0003408)
Program**

Prime Recipient (Control No.)	Project Title	Categorical Exclusion
Michigan State University (3405-1524)	N-SYNC: Engineering Synchronized Nitrogen Efficiency Traits in Corn Agriculture	B3.6, B3.1
University of Tennessee, Knoxville (3405-1543)	SyN-Fix: Synthetic Biology to Improve Nitrogen Cycling in the Maize Rhizosphere	B3.6
Lawrence Berkeley National Laboratory (3405-1505)	Developing Biological Nitrification Inhibitors to Reduce N2O Emissions in Sorghum	B3.6, B3.1
Colorado State University (3405-1545)	Breeding and Mechanisms to Maximize Yield at 45% Current Nitrogen Level	B3.6, B3.1
Texas A&M AgriLife Research (3405-1507)	Developing Field-deployable Low Nitrous Oxide Emission Sorghum Hybrids Using Biological Nitrification Inhibition and Nitrogen Fixation	B3.6, B3.1
New York University (3405-1553)	TF Regulon Engineering: Reducing N2O Emissions by Increasing NUE in Bioenergy Crops	B3.1, B3.6

Bold text indicates the five projects included in the First Amended CX.



U.S. Department of Energy

Categorical Exclusion Determination Form

Proposed Action Title: Technologies to Emend and Obviate SYnthetic Nitrogen's Toll on Emissions -- TEOSYNTE and TEOSYNTE SBIR-STTR (NOFO Nos. DE-FOA-0003405 and DE-FOA-0003408)

Program or Field Office: Advanced Research Projects Agency - Energy

Location(s) (City/County/State): Urbana, IL; New York, NY

Proposed Action Description:

The Technologies to Emend and Obviate SYnthetic Nitrogen's Toll on Emissions (TEOSYNTE) program supports projects that focus on plant and microbial bio-design strategies that reduce the need to apply synthetic nitrogen fertilizer on corn and sorghum fields while maintaining crop yields. If successful, TEOSYNTE projects would lower costs to farmers by reducing the use of synthetic fertilizer, reduce imports of foreign synthetic nitrogen fertilizer by lowering nitrogen fertilizer used in U.S. agriculture by 27%, lower the demand for natural gas feedstock for fertilizer production, and improve the efficiency of ethanol production from bioenergy crops, thereby increasing U.S. energy security.

The TEOSYNTE Program is composed of 9 small-scale research and development projects that will be conducted by universities, large and small businesses, and national laboratories. This Determination covers 1 of the 9 projects (listed in Attachment A). This project fits within the class of actions identified under the DOE Categorical Exclusions identified below. This assessment was based on a review of the proposed scope of work and the potential environmental impacts of each project. All project tasks will be conducted in accordance with established safety and materials/waste management protocols and pursuant to applicable Federal, State, and Local regulatory requirements. New York University has not obtained all necessary permits and approvals applicable to their proposed actions and is prohibited from commencing applicable project work until those permits are obtained. Per the terms of the award, a permits certification and, if necessary, an amended NEPA Determination, are required prior to the conduct of applicable project work.

Categorical Exclusion(s) Applied:

B3.6 - Small-scale research and development, laboratory operations, and pilot projects

B3.1 - Site characterization and environmental monitoring

For the DOE procedures regarding categorical exclusions, including the full text of each categorical exclusion, see 10 CFR 1021.102 and Appendix B to [10 CFR Part 1021](#), and also Section 5.4 (Applying one or more categorical exclusions to a proposal) and Appendices B and C of [DOE's National Environmental Policy Act Implementing Procedures](#) (June 30, 2025).

Requirements and guidance in 10 CFR 1021.102 and DOE's NEPA Implementing Procedures: (See full text in regulation and in Implementing Procedures)

☐ The proposal fits within a class of actions that is listed in Appendix B to 10 CFR Part 1021 or Appendix B and C of DOE's NEPA Implementing Procedures (June 30, 2025).

To fit within the classes of actions listed in Appendix B to 10 CFR Part 1021, or Appendix B of DOE's NEPA Implementing Procedures, a proposal must satisfy the conditions that are integral elements of the classes of actions in Appendix B of both 10 CFR Part 1021 and DOE's NEPA Implementing Procedures.

☐ There are no extraordinary circumstances related to the proposal that may affect the significance of the environmental effects of the proposal. DOE or an applicant may modify the proposal to avoid reasonably foreseeable adverse significant effects such that the categorical exclusion would apply.

☐ The proposal has not been segmented to meet the definition of a categorical exclusion.

[Note: For proposals that fit within the categorical exclusions listed in Appendix C of DOE's NEPA Implementing Procedures, see DOE's notice of adoption for the subject Appendix C categorical exclusion for additional considerations. DOE notices of adoption for other agency categorical exclusions may be found on [DOE's Section 109 webpage](#).]

Based on my review of the proposed action, as NEPA Compliance Officer, I have determined that the proposed action fits within the specified class(es) of action, the other requirements and guidance set forth above are met, and the proposed action is hereby categorically excluded from further NEPA review.

NEPA Compliance Officer: **GEOFFREY
GOODE**

Digitally signed by GEOFFREY
GOODE
Date: 2025.08.01 15:49:58 -04'00'

Date Determined:

Attachment A: Projects in the TEOSYNTE (NOFO Nos. DE-FOA-0003405 and DE-FOA-0003408) Program

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